UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ONEPLUS TECHNOLOGY (SHENZHEN) CO., LTD,
Petitioner

v.

PANTECH CORPORATION,
Patent Owner

U.S. Patent No. 9,369,251

Case No. IPR2025-00888

DECLARATION OF FRIEDHELM RODERMUND IN SUPPORT OF A PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 9,369,251

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I, Friedhelm Rodermund, do hereby declare as follows:

I. INTRODUCTION AND ENGAGEMENT

1. I have been retained in this matter by the Petitioner to provide testimony regarding the standard business practices of 3rd Generation Partnership Project ("3GPP") for record keeping and publishing technical specifications, change request proposals, reports, and other documents developed during the course of standards activities carried out by 3GPP and the European Telecommunications Standards Institute ("ETSI").

2. I have been asked to provide my opinions regarding the authenticity and dates of public accessibility of the following 3GPP document:

- TDoc R1-103696, which represents a 3GPP document with the title "CSI-RS Patterns for LTE-Advanced" (hereinafter "R1-103696") (Ex. 1008)
- TDoc R1-102628, which represents a 3GPP document with the title "Considerations on CSI-RS Design" (hereinafter "R1-102628") (Ex. 1012)
- TDoc R1-104027, which represents a 3GPP document with the title "E-mail discussion on PDSCH muting for CSI RS design" (hereinafter "R1-104027") (Ex. 1011)

- TDoc R1-103486, which represents a 3GPP document with the title "On aperiodic SRS Transmission in LTE-A" (hereinafter "R1-103486") (Ex. 1010)
- TDoc R1-103657, which represents a 3GPP document with the title "Discussion on the overhead of muting" (hereinafter "R1-103657 (Ex. 1018)

3. As an ETSI Project Manager and Secretary, from June 1998 to December 2004, I have personal knowledge of 3GPP's standard business and records keeping practices. I continued following 3GPP's work ever since. Thus, based on my experience, personal knowledge, and review of 3GPP's business records, I am able to testify regarding the authenticity of certain documents published by 3GPP and the timing of their publication.

4. I am also knowledgeable about document management practices and the usage of email reflectors in 3GPP TSG RAN WG1. This is due to the fact that all 3GPP working groups used the same document repository on ftp.3gpp.org and all working groups use the same email exploder tool. Thus, I'm able to testify regarding the availability and authenticity of any 3GPP documents.

5. I am being compensated for my time spent on this matter at my usual rate of €450 per hour. My fee is not contingent on the outcome of this or any matter,

or on the content of any of the testimony I give in this declaration. I have no financial interest in the Petitioner.

6. I have been informed that Pantech Corporation ("Pantech" or "Patent Owner") is the current assignee of U.S. Patent No. 9,369,251 ("the '251 Patent") (Ex. 1001). I have no financial interest in the Patent Owner or the '251 patent.

7. In forming my opinions, I have considered the cited exhibits, including the exhibits identified in Appendix B, and my academic and professional training and experience in the field of wireless communications and standards development as described herein.

II. BACKGROUND AND QUALIFICATIONS

8. I have more than 25 years of experience working with standards development organizations including 3GPP, ETSI, and the Open Mobile Alliance ("OMA"). I have particular experience with the development of standards related to cellular telecommunications, including the standards for the Universal Mobile Telecommunications System ("UMTS"), Long Term Evolution ("LTE"), and 5G, which are all standards developed by the 3GPP.

9. I attended the University of Technology Aachen in Aachen, Germany, where I performed graduate studies in Electrical Engineering with a focus on telecommunications technologies ("Dipl.-Ing. TH" degree). I also attended the University of Technology Trondheim in Trondheim, Norway, and completed my

Diploma thesis, "Design of a dual processor computer for digital signal processing in power electronics," in 1993.

10. From December 1993 to June 1998, I worked at Mannesmann Mobilfunk as a System Engineer and Project Manager in Quality Assurance and Technical Standards. One of my responsibilities was to ensure by managing and performing related test activities that cellular network equipment was compatible with the Global System for Mobile Communications ("GSM") standard developed by ETSI. During that time, I also started working as a standards delegate. I attended my first ETSI meeting in 1996 (although I was already following ETSI developments from 1992 during my studies).

11. From June 1998 to December 2004, I worked at ETSI as a project manager for various ETSI Special Mobile Group ("SMG") and 3GPP working groups. First, I served as a secretary of SMG4 "Data Services" and SMG8 "Base Stations Testing." Then, as a project manager with the ETSI Mobile Competence Center ("MCC"), I supported establishing 3GPP as the new international standards development organization for cellular telecommunications. One of my roles was acting as Secretary for 3GPP's Technical Specifications Group Terminals, Working Group ("T2"), the group which played a leading role in the creation of standards for Multimedia such as the Multimedia Messaging Service ("MMS").

12. Later, I was a secretary of the highest-level Technical Specifications Group Terminals which was besides other things responsible for the development of test specifications including tests for the radio interface.

13. I edited all technical specifications produced by my working groups and presented results to the parent body for approval. I attended all meetings (apart from some sub-working group meetings) and was also responsible for compiling meeting reports, for handling all the meeting documents, and managing the work plan. It was also my role to guide the groups and to advise the chairmen regarding 3GPP working methods and procedures including document handling, and to make sure delegates were aware of their company's obligations under the 3GPP Intellectual Property Rights policy.

14. As part of my responsibilities at ETSI, I acted as a 3GPP custodian of records by personally managing 3GPP's public File Transfer Protocol (FTP) folders, which I used to make publicly accessible various 3GPP documents, including versions of 3GPP specifications, technical reports, liaison statements, change requests, contributions, agendas, meeting reports, and other 3GPP documents from my working groups. I am also knowledgeable about document management practices used in other working groups and within 3GPP in general with regard to making documents publicly accessible through the same public FTP server of 3GPP.

15. Since I left ETSI as a staff member in 2005, I have been continuously involved in standardization activities, including with OMA, ETSI, and 3GPP. Since 2017, I also have been attending the ETSI Intellectual Property Rights ("IPR") Special Committee, which is responsible for the maintenance of the ETSI IPR Policy.

16. After I left ETSI, I worked from January 2005 to October 2014 at Vodafone, first as a Project Manager for Mobile Broadcast Standards, and then as Vice Chairman of the Device Management working group of the Open Mobile Alliance, and then as a Senior Standards Strategist, all with responsibilities as described on my curriculum vitae. At Vodafone, I was deeply involved in standards work with ETSI and 3GPP and other standards setting organizations, including as a delegate to 3GPP SA1 "Services." As part of my responsibilities, I attended selected 3GPP meetings, submitted documents to 3GPP, used 3GPP resources (including 3GPP's FTP server) extensively, and remained knowledgeable about 3GPP policies and procedures with regard to document management and public accessibility. I was also involved in the creation of patents, defense activities related to patent litigations, and patent evaluation, mostly in the context of standards development.

17. Since leaving Vodafone in 2014, I have performed consulting work regarding Internet of Things (IoT) and Machine to Machine (M2M) technology and standards, first at Friedhelm Rodermund Consulting and then as the Founder and

Director of IOTECC GmbH. In connection with my work, I regularly deal with standards such as OMA's Lightweight M2M (LwM2M) and 3GPP's LTE, Narrowband IoT (NB-IoT) and 5G standards. And I have extensively used 3GPP resources and have remained knowledgeable about 3GPP policies and procedures with regard to document management and public accessibility.

18. I also provide consulting services related to patents, in particular around 3GPP Standard Essential Patents ("SEPs"), and I have worked as an expert witness on a number of occasions. I continue to closely follow the maintenance of the ETSI IPR Policy as a delegate to the ETSI IPR Special Committee. Furthermore, I am conducting a seminar on SEPs and the Internet of Things at the Technical University of Ilmenau, Germany.

19. At the time of writing this declaration, I am following – including attending selected meetings – the following standards committees: ETSI oneM2M, ETSI IPR Special Committee, OMA, and 3GPP.

20. A copy of my curriculum vitae, which includes a detailed description of my experience and education, is attached as Appendix A. A list of litigation matters on which I have worked over the last five years is also included in my curriculum vitae.

III. SUMMARY OF MY OPINIONS

21. It is my opinion that Ex. 1008 is an authentic copy of 3GPP TDoc R1-

103696 that was uploaded and made available via the 3GPP FTP server to 3GPP delegates and the general public by June 22, 2010, at the latest.

22. It is my opinion that Ex. 1012 is an authentic copy of 3GPP TDoc R1-102628 that was uploaded and made available via the 3GPP FTP server to 3GPP delegates and the general public by May 5, 2010, at the latest.

23. It is my opinion that Ex. 1011 is an authentic copy of 3GPP TDoc R1-104027 that was uploaded and made available via the 3GPP FTP server to 3GPP delegates and the general public by July 5, 2010, at the latest.

24. It is my opinion that Ex. 1010 is an authentic copy of 3GPP TDoc R1-103486 that was uploaded and made available via the 3GPP FTP server to 3GPP delegates and the general public by June 22, 2010, at the latest.

25. It is my opinion that Ex. 1018 is an authentic copy of 3GPP TDoc R1-103657 that was uploaded and made available via the 3GPP FTP server to 3GPP delegates and the general public by June 22, 2010, at the latest.

IV. PUBLICATION OF 3GPP SPECIFICATIONS AND RELATED DOCUMENTS

A. General Practices

26. Unless otherwise noted, the foregoing and following is an accurate description of 3GPP general practices from 1998 to the present, including in 2010, regardless of whether I use the present or past tense to describe those practices.

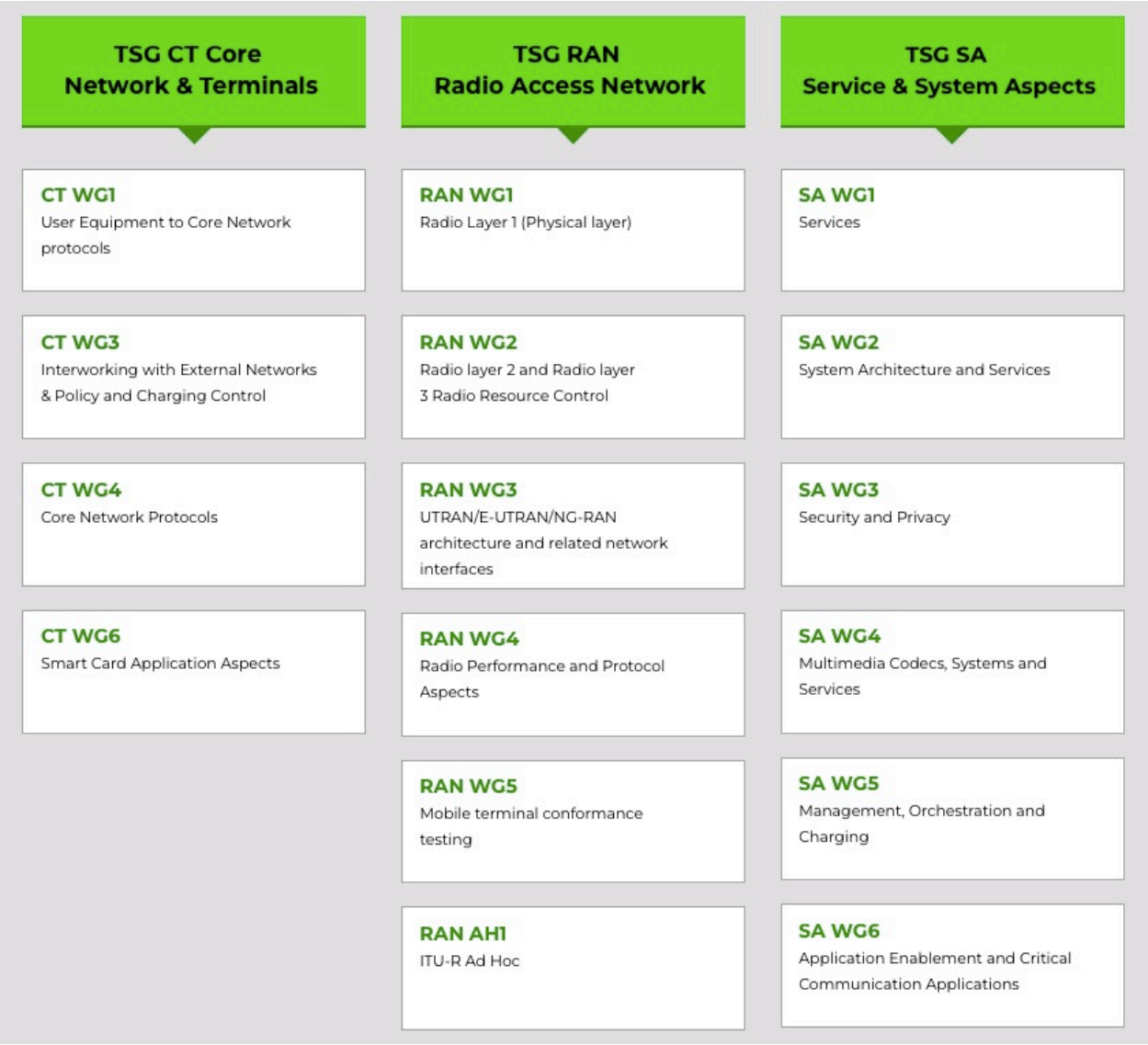
27. 3GPP was established in 1998 by a group of telecommunications standard development organizations from Japan, Korea, China, Europe, and the United States to jointly develop worldwide standards for mobile telecommunications. Today, 3GPP consists of seven partners: Association of Radio Industries and Businesses, Japan ("ARIB"), Alliance for Telecommunications Industry Solutions, USA ("ATIS"), China Communications Standards Association ("CCSA"), European Telecommunications Standards Institute ("ETSI"), Telecommunications Standards Development Society, India ("TSDSI"), Telecommunications Technology Association, Korea ("TTA"), and Telecommunication Technology Committee, Japan ("TTC"). In addition to being one of the founding partners, ETSI hosts the Mobile Competence Centre ("MCC"), which provides administrative and technical support for the day-to-day work of 3GPP. Furthermore, ETSI manages 3GPP's IT services, such as the 3GPP website, FTP server, and email exploders.

28. 3GPP is the world's leading organization for developing and maintaining cellular telecommunications standards, which it has done since its foundation in 1998. As noted above and in my curriculum vitae, I began working for 3GPP, as part of my work at ETSI, the European-based organizational partner of 3GPP.

29. In the ordinary course of its regularly conducted business activities, and pursuant to its standard business practices, 3GPP publishes technical specifications, proposals, reports, and other documents related to the development of cellular telecommunications standards. Such documents are published for the purposes of discussion and establishment of industry standards for cellular telecommunications. This has been 3GPP's ordinary course of business since when I began working at ETSI in 1998.

30. In the ordinary course of 3GPP's regularly conducted business activities, and pursuant to its standard business practices, all draft technical specifications, proposals, reports, and other temporary documents to be discussed or considered in relation to 3GPP's telecommunications standards activities were, and continue to be, assigned a temporary document number and made publicly available, including on the FTP server associated with the 3GPP website, currently residing at ftp.3gpp.org. Such documents are referred to as "TDocs." Final versions of the technical specifications also were, and continue to be, publicly accessible from that same FTP server.

31. The names and the structure of 3GPP working groups, as of today, can be found at https://www.3gpp.org/3gpp-groups (reproduced below):



32. Each Technical Specification Group (TSG) or Working Group adopts a structured numbering system for the documents associated with their meetings, and those systems typically follow a consistent numbering system, as shown in the following example: xminnzzzz. The numbering system normally comprises five logical elements: (1) x: a single letter corresponding to the TSG; wherein in 2010 x was one of G (GSM EDGE Radio Access Network), R (Radio Access Network), C

(Core Network and Terminals), or S (Service and System Aspects); (2) m: a single character corresponding to the Working Group identity (typically 1, 2, 3, etc.) or, in the case of the TSG itself, the letter "P"; (3) i: normally the hyphen character "-"; (4) nn: the calendar year of the meeting to which the document was submitted; and (5) zzzz: a running number (some working groups use 5 digits).

33. In the ordinary course of 3GPP's regularly conducted business activities, and pursuant to its standard business practices, from December 1998 onwards, 3GPP published all its TDocs and all final versions of its technical specifications on its FTP server, which has always been easily and publicly accessible from its website and currently resides at ftp.3gpp.org.

34. As early as December 1998, including in 2010, 3GPP's FTP server was freely accessible to the general public with no login, password, or membership requirement.

35. By 1999, at least 100 companies were members of 3GPP (719 companies by December 2020), ranging from Bosch to Ericsson to Nokia to Samsung and generally including those interested in the discussion, creation, and adoption of cellular telecommunications standards, including UMTS. Each of these companies typically delegated multiple individuals to regularly participate in 3GPP meetings. Further, pursuant to 3GPP's standard business practices, 3GPP working groups sent emails notifying these individuals as soon as new or additional

documents had been uploaded to 3GPP's FTP server. Thus, not only did the general public have access to the documents on the FTP server, but some of the most interested members of the public—those working to develop standards for cellular telecommunication or working to implement the standards—were personally informed of their availability by email.

36. Based on my experience with 3GPP and the telecommunications industry, I would expect any person implementing a cellular network or device, e.g., an LTE or 5G network, to consult the corresponding specifications on the 3GPP FTP server, as well as other related documents. The whole purpose of 3GPP creating and making these specifications available was so that engineers and other individuals would have ready access to them when developing and implementing cellular networks and devices.

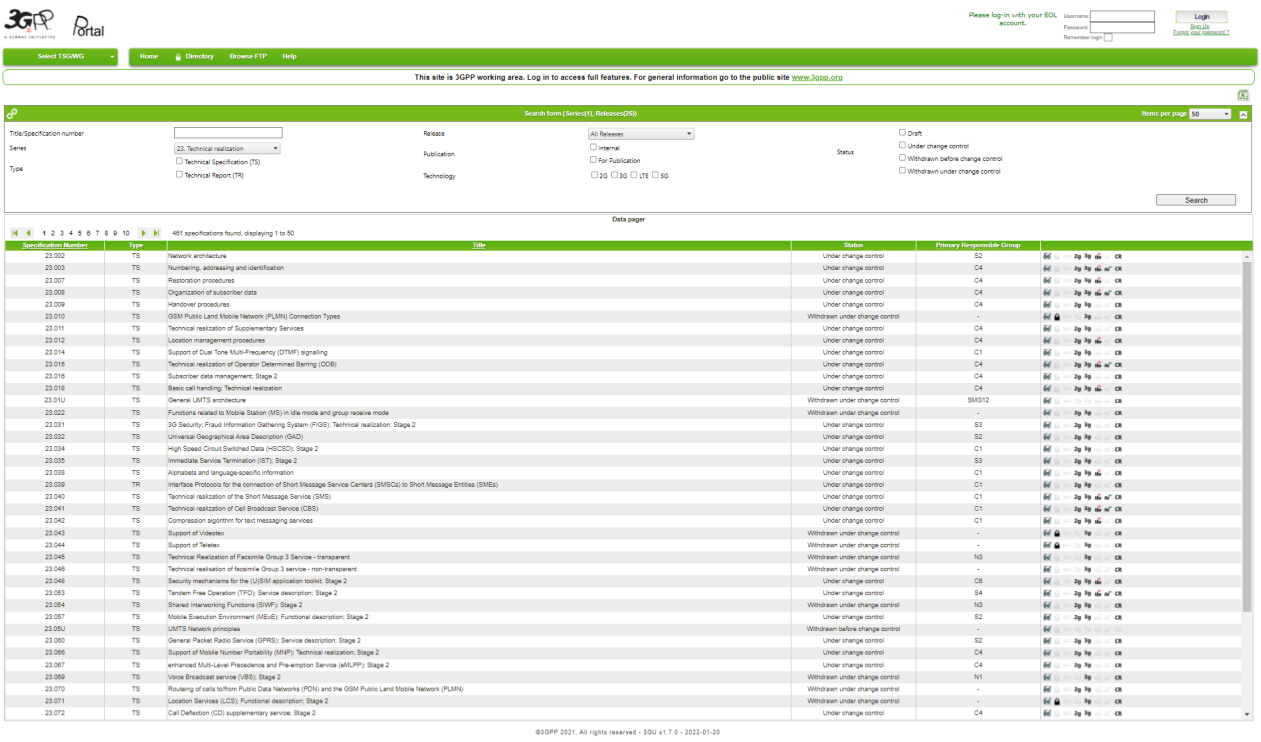
37. Since its creation in December 1998, 3GPP's FTP server has been well-known to persons in the cellular telecommunications industry as a source of public information regarding industry standards and technological advances.

38. 3GPP specifications bear a specification number consisting of four or five digits, e.g., 09.02 or 29.002. The first two digits define the specification series which are defined to group the different aspects of the 3GPP system into, e.g., requirements, service aspects, radio aspects codecs, security aspects, and test specifications. The series digits are followed by two additional digits for the 01 to

13 series or three further digits for the 21 to 55 series. The subjects of the individual specification series are explained on 3GPP's website at https://www.3gpp.org/specifications-technologies/specifications-by-series, and reproduced below.

Subject of specification series	3G and beyond / GSM (R99 and later)	GSM only (Rel-4 and later)	GSM only (before Rel-4)
Requirements	21 series	41 series	01 series
Service aspects ("stage 1")	22 series	42 series	02 series
Technical realization ("stage 2")	23 series	43 series	03 series
Signalling protocols ("stage 3") - user equipment to network	24 series	44 series	04 series
Radio aspects	25 series	45 series	05 series
CODECs	26 series	46 series	06 series
Data	27 series	47 series (none exists)	07 series
Signalling protocols ("stage 3") -(RSS-CN) and OAM&P and Charging (overflow from 32.- range)	28 series	48 series	08 series
Signalling protocols ("stage 3") - intra-fixed-network	29 series	49 series	09 series
Programme management	30 series	50 series	10 series
Subscriber Identity Module (SIM / USIM), IC Cards. Test specs.	31 series	51 series	11 series
OAM&P and Charging	32 series	52 series	12 series
Access requirements and test specifications		13 series [1]	13 series [1]
Security aspects	33 series	(2)	(2)
UE and (U)SIM test specifications	34 series	(2)	11 series
Security algorithms [3]	35 series	55 series	(4)
LTE (Evolved UTRA), LTE-Advanced, LTE-Advanced Pro radio technology	36 series		
Multiple radio access technology aspects	37 series		
Radio technology beyond LTE	38 series		

39. Following a link for a series (e.g., "23 series" link) leads to a 3GPP web page providing access to all specifications in a series, as shown by the screenshot below:



40. As another example of a series, the LTE radio standard is covered in the "36 series" and is further subdivided into separate sections or specifications. The LTE radio specification series starts at TS 36.101 and ends at TR 36.978. Excluding withdrawn specifications, the LTE standard consists of more than 250 specifications.

41. As another example of a series, the 5G New Radio (NR) standard is covered in the "38 series" and is further subdivided into separate sections or

specifications. Selecting the "38 series" link on the website shown in paragraph 33 leads to the 3GPP portal (portal.3gpp.org) page for all of the 38 series technical specifications.[1] These 5G NR specifications start at TS 38.101 and end at TR 38.922. Excluding withdrawn specifications, the 5G NR standard consists of more than 140 specifications.

42. Each LTE or 5G specification can span from a few pages to hundreds of pages. One full version of the LTE or 5G standard is massive, spanning tens of thousands of pages across the particular series of technical specifications.

43. In the ordinary course of 3GPP's regularly conducted business activities, and pursuant to its standard business practices, TDocs are usually uploaded to 3GPP's FTP server and website before the meeting where they are to be discussed. Documents created or revised during the course of a meeting are normally uploaded at the latest during the week following the meeting (e.g., the meeting report of the meeting is usually published for review during the week following the meeting).

44. In the ordinary course of 3GPP's regularly conducted business activities, and pursuant to its standard business practices, 3GPP maintains archives that include different versions of the specifications, as well as email communications

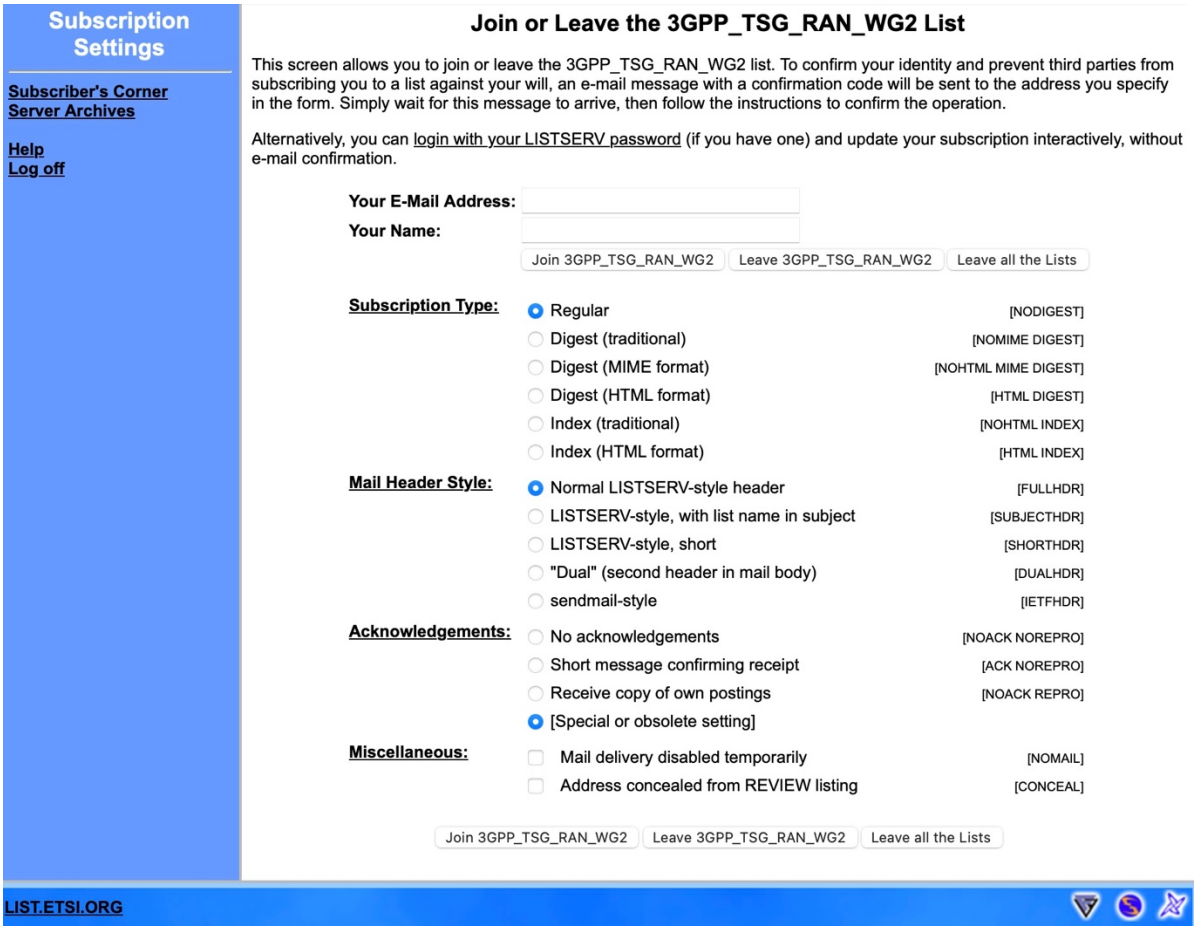
[1] https://portal.3gpp.org/Specifications.aspx?q=1&series=45&releases=all&draft=False&underCC=False&withACC=False&withBCC=False&numberNYA=False

to its membership, including emails announcing the uploading of new or additional documents to 3GPP's FTP server. These archives are created at the time the emails are initially sent.

45. Since their creation in December 1998, all of 3GPP's email archives, including the dedicated email lists for TSG RAN WG1, have been freely accessible to the general public with no login, password, or membership requirement and subscription was possible for every interested individual. As an example, the screenshot below represents the subscription page of the 3GPP RAN WG2 email list on list.etsi.org[2] demonstrating that this webpage is publicly available and that only an email address and name had to be entered to join the email list. In 2006, the registration webpage looked as follows:[3]

[2] In the past there was also list.3gpp.org which did not represent a dedicated website but instead redirected to list.etsi.org.

[3] https://web.archive.org/web/20060105222647/http://list.etsi.org/scripts/wa.exe?SUBED1=3gpp_tsg_ran_wg2&A=1. The 2010 webpage looked identical, or nearly identical but it has not been recorded by the Internet Archive. The subscription webpages looked the same for all 3GPP working groups apart from the working group name.

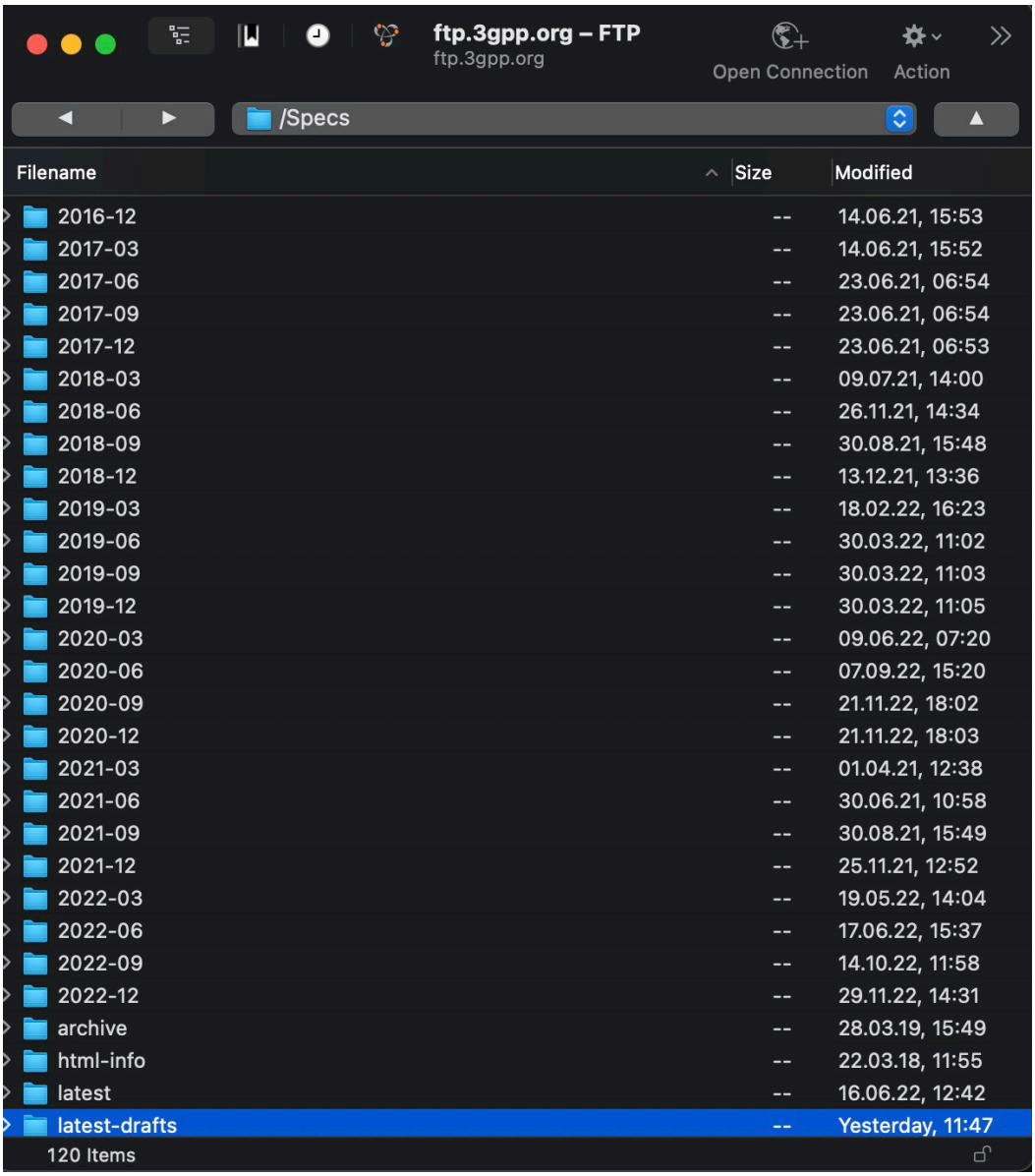


46. Alternatively, anyone interested can obtain a LISTSERV password for managing subscriptions interactively without email confirmations.

47. Each of 3GPP's member companies typically assigned one or more individuals to regularly participate in these email lists. Thus, not only did the general public have access to the emails in 3GPP's email archives, but some of the most interested members of the public—those working to develop standards for cellular telecommunication—personally received copies of such emails through their participation in the email lists.

48. Since their creation in December 1998, 3GPP's email archives have been well-known to persons in the cellular telecommunications industry as a source of public information and for technical specifications, proposals, meeting announcements, technical discussions and reports regarding industry standards and technological advances.

49. 3GPP specifications almost always are duplicated in at least two and sometime more locations on the FTP server. One location corresponds to a "snapshot" of the specifications corresponding to a particular plenary meeting cycle—for instance, the 2018-12 snapshot contains a snapshot of numerous specifications after the December 2018 3GPP plenary meetings. The second location is an "archive" that contains all versions over time for a given specification. The screenshot below shows an excerpt of the "Spec" folder at ftp.3gpp.org:

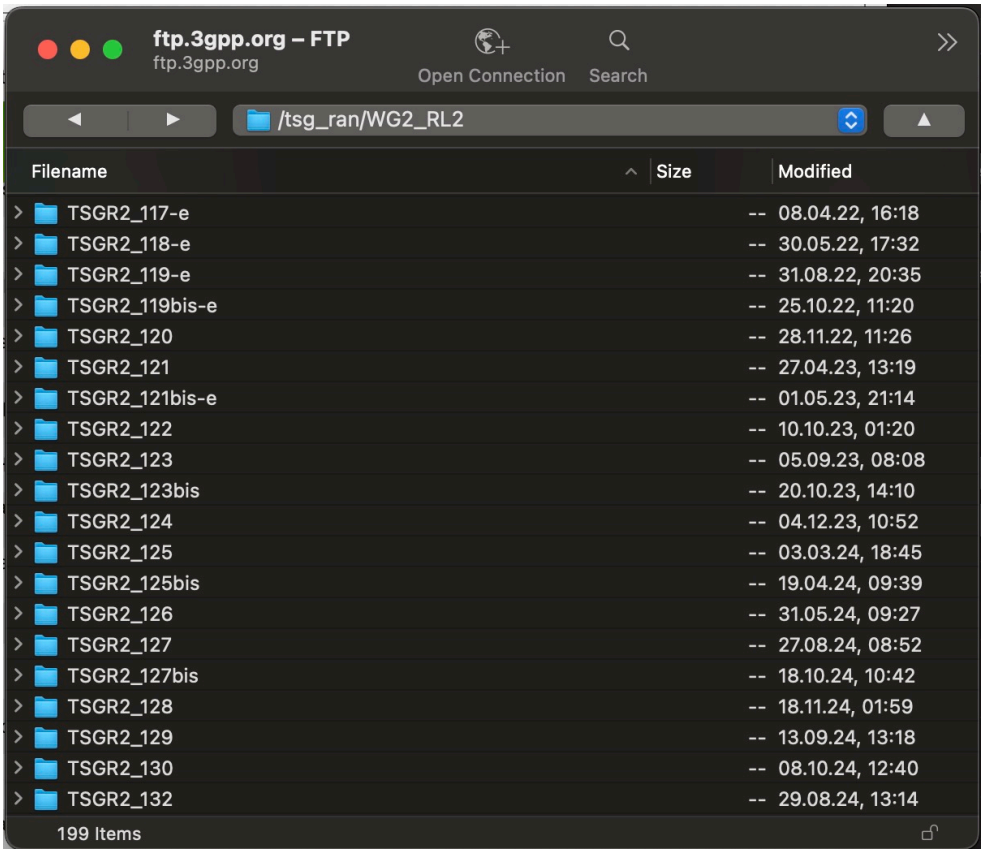


50. While 3GPP aims to upload the updated specifications to both locations at the same time, occasionally there may be a small difference in the upload date, and thus the date stamp, for the same specification uploaded to the two locations. Additionally, specifications which are not yet approved (so called "draft" specifications) are presented as TDocs at working group and at plenary meetings (as soon as the working group decides to submit the specification to the plenary meeting

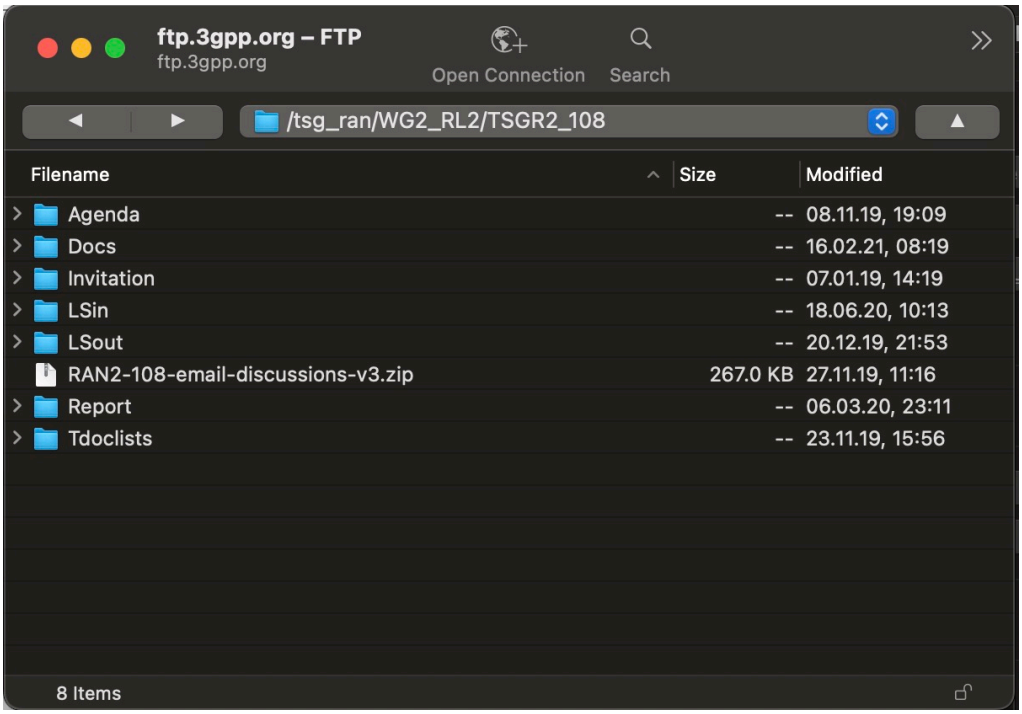
for information or approval). In many cases, the TDocs are also distributed on the email exploder of the working group prior to the meeting, making the TDocs available to all those subscribed to the email distribution list.

51. The timestamp on 3GPP's FTP server shows the date when the document was uploaded the last time. Thus, the timestamp shows the latest possible date the document became publicly available and accessible on 3GPP's FTP server. The given document might have been available earlier and the original timestamp might have been overwritten because the document was uploaded again. According to my experience, this is something which happened occasionally. Thus, the FTP timestamp is reliable as the latest possible upload date but one cannot determine whether it represents the first upload of a document to the FTP server.

52. 3GPP's working practice to store their documents on its FTP server, as described above, has not changed over time. Starting from the first 3GPP meetings in 1998 until present, all WGs and plenary meetings are represented by dedicated meeting folders on the FTP server. These meeting folders include the documents discussed at the meetings. Both the folders and the documents are accessible to the public. Almost every week, a new meeting folder with the respective documents is added. As an example, the screenshot below shows an extract of the RAN WG2 folder named "WG2_RL2" showing that every meeting has a dedicated number:



53. As an example, the screenshot below shows the typical structure of a meeting folder including the most important folders “Agenda”, “Docs” (includes all meeting contributions), and “Report” (includes the meeting report):



54. In addition to the plenary and WG meeting folders and some other folders, there is also the "Specs" folder, which holds all 3GPP specifications including the aforementioned "snapshot" and archive folders. Since the early days of 3GPP, a new folder is added inside the "Specs" folder after each TSG plenary meeting in order to hold the latest versions of specifications approved at those TSG plenary meetings. This is still 3GPP's working practice today; thus, this practice has not changed over time.

55. 3GPP maintains a set of publicly accessible documents[4] providing further details on its way of working:

[4] All available from https://www.3gpp.org/delegates-corner/3gpp-working-procedures

- 3GPP Working Procedures
- Vocabulary for 3GPP Specifications 3GPP TR 21.905
- Working Methods 3GPP TR 21.900
- Specification Drafting Rules 3GPP TR 21.801

B. Specific Documents

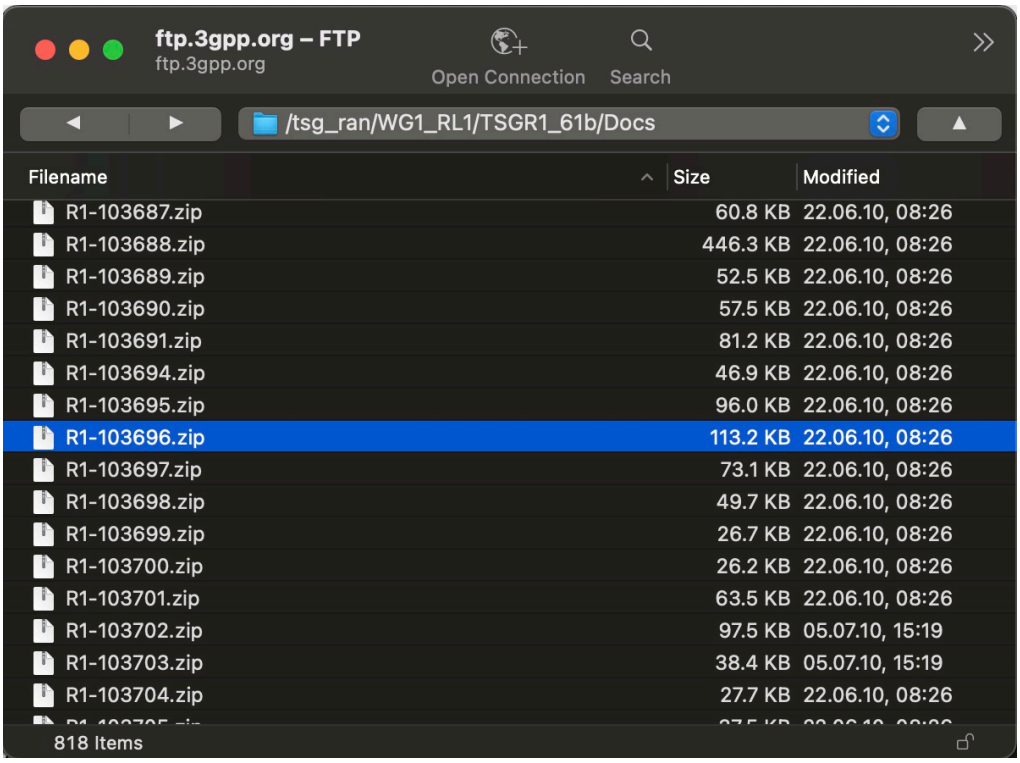
1. TDoc R1-103696

56. Based on my personal knowledge and my review of 3GPP's business records, I recognize Ex. 1008 as a true and correct copy of 3GPP TDoc R1-103696, which represents a 3GPP document with the title "CSI-RS Patterns for LTE-Advanced." The document was authored by Texas Instruments and discussed CSI-RS patterns and related performance evaluations.

57. On its face, R1-103696 refers to the RAN WG1 meeting #61bis held on June 28 - July 2, 2010, in Dresden, Germany. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, this information tells me that R1-103696 was available either prior to or during or shortly after that meeting to all attending 3GPP members and to the general public.

58. The public availability of the document is confirmed by the date stamp, June 22, 2010, shown on the historic 3GPP FTP server for the corresponding downloadable file ("R1-103696.zip"), as maintained by the Internet Archive at https://web.archive.org/web/20140328144651/http://3gpp.org/ftp/tsg_ran/WG1_R

L1/TSGR1_61b/Docs/. This information is also shown on the date stamp for the present-day listing of the same document on the 3GPP FTP server at https://www.3gpp.org/ftp/tsg_ran/wg1_rl1/TSGR1_61b/Docs as shown in the screenshot below:



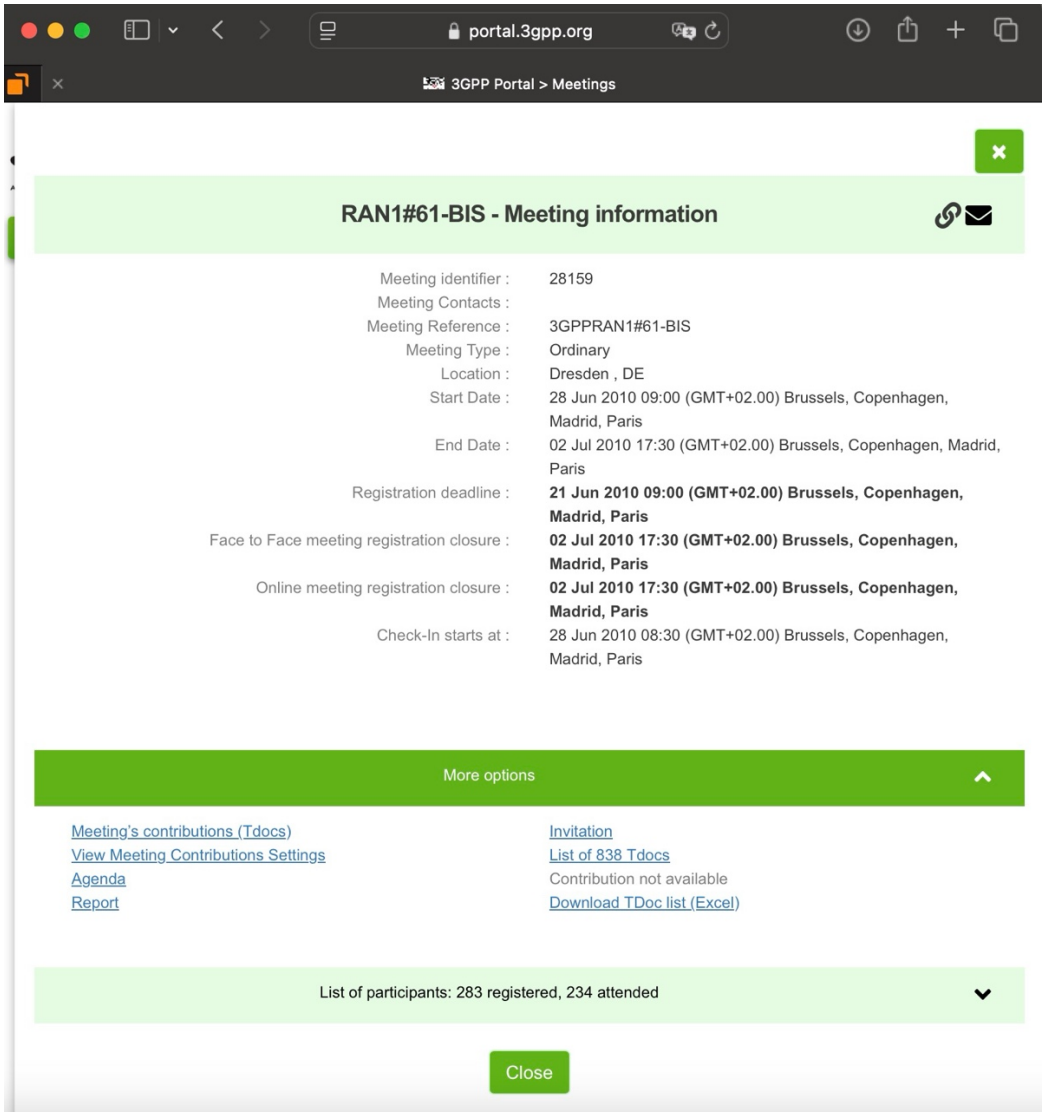
59. Experts in the field of determining the public availability of 3GPP documents would reasonably rely upon the FTP server upload date on the 3GPP FTP server as the date the document became available to the public.

60. In addition, metadata information for the downloaded and extracted TDoc file states a last "Modified" date of "21. June 2010," as shown in the screenshot below.



61. This last modified date is well aligned with the June 22, 2010, upload date of the document, and the standard business practice among 3GPP participants to upload submissions shortly after completing them.

62. The final meeting report of the RAN WG1 meeting 61bis held on June 28 - July 2, 2010, in Dresden, Germany, can be found in Appendix C. According to the 3GPP website at https://portal.3gpp.org/Meetings.aspx#/ which is shown in the screenshot below, that meeting was attended by 234 individuals (out of 283 registered participants):



63. The meeting report mentions R1-103696 on page 47 which clearly indicates that the document was registered for this meeting. The document is indicated as "Not treated" (likely due to lack of meeting time), as can be seen at the screenshot below:

Not treated.

R1-103483	Remaining issues on CSIRS design	CATT	
R1-103588	CSI-RS Pattern Design in Normal-CP Subframe	ZTE	
R1-103589	CSI-RS Pattern Design in Extended-CP Subframe	ZTE	
R1-103613	CSI-RS pattern design in LTE-Advanced	Pantech	
R1-103655	Discussions on CSI-RS design	Samsung	
R1-103696	CSI-RS patterns for LTE-Advanced	Texas Instruments	

64. Furthermore, the meeting report includes in the zip file the meeting's document list of which an excerpt can be found in Appendix D[5]. R1-103696 is listed in row 272 and is tagged as "Available: Yes":

5	Available	Agenda Item	Tdoc Number	Title	Source	Conclusion/Decision
272	Yes	6.3.2.1	R1-103696	CSI-RS patterns for LTE-Advanced	Texas Instruments	Not treated

65. Furthermore, the document was distributed via the 3GPP_TSG_RAN_WG1 email exploder on June 22, 2010, as shown in Appendix E. At about that time this email exploder had around 1313 subscribers as can be seen

[5] Given the size of the document list the Appendix only includes the columns relevant for this declaration.

by the Internet Archive at https://web.archive.org/web/20100326093131/http://list.etsi.org/.

66. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, Ex. 1008 is an authentic copy of 3GPP TDoc R1-103696 that was uploaded and made available via the 3GPP FTP server to the general public by June 22, 2010, at the latest.

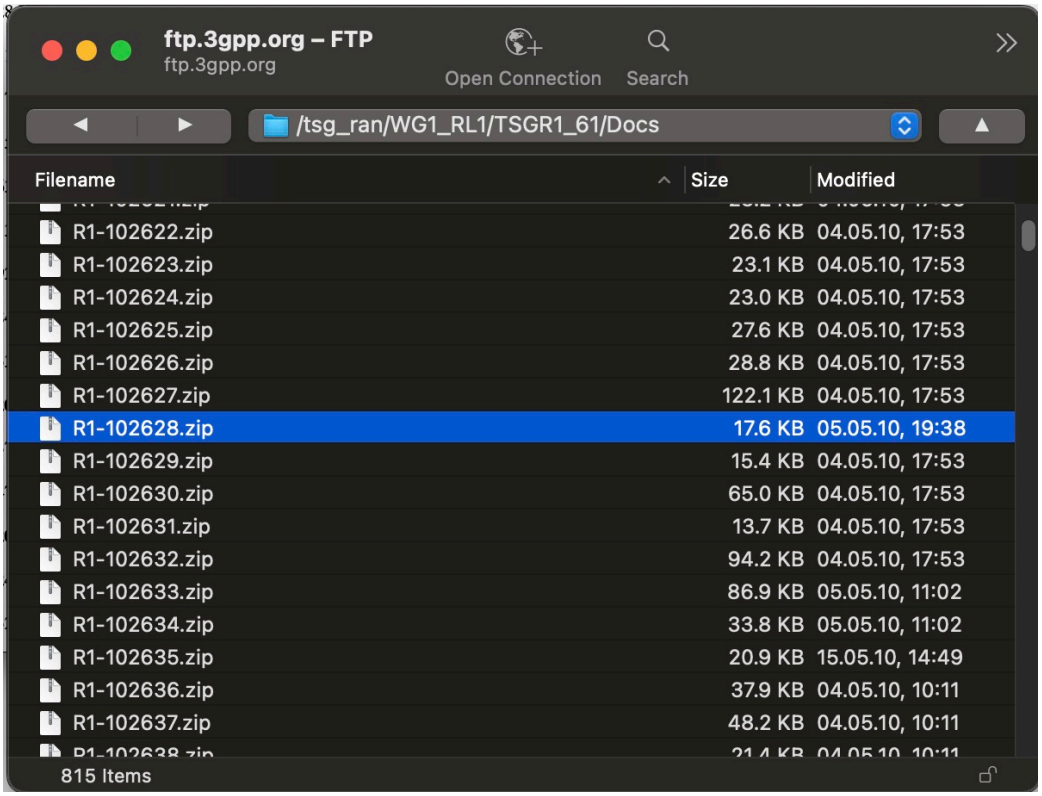
2. TDoc R1-102628

67. Based on my personal knowledge and my review of 3GPP's business records, I recognize Ex. 1012 as a true and correct copy of 3GPP TDoc R1-102628, which represents a 3GPP document with the title "Considerations on CSI-RS Design." The document was authored by Ericsson and ST-Ericsson and discussed outstanding issues on CSI-RS design.

68. On its face, R1-102628 refers to the RAN WG1 meeting #61 held on May 10-14, 2010, in Montreal, Canada. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, this information tells me that R1-102628 was available either prior to or during or shortly after that meeting to all attending 3GPP members and to the general public.

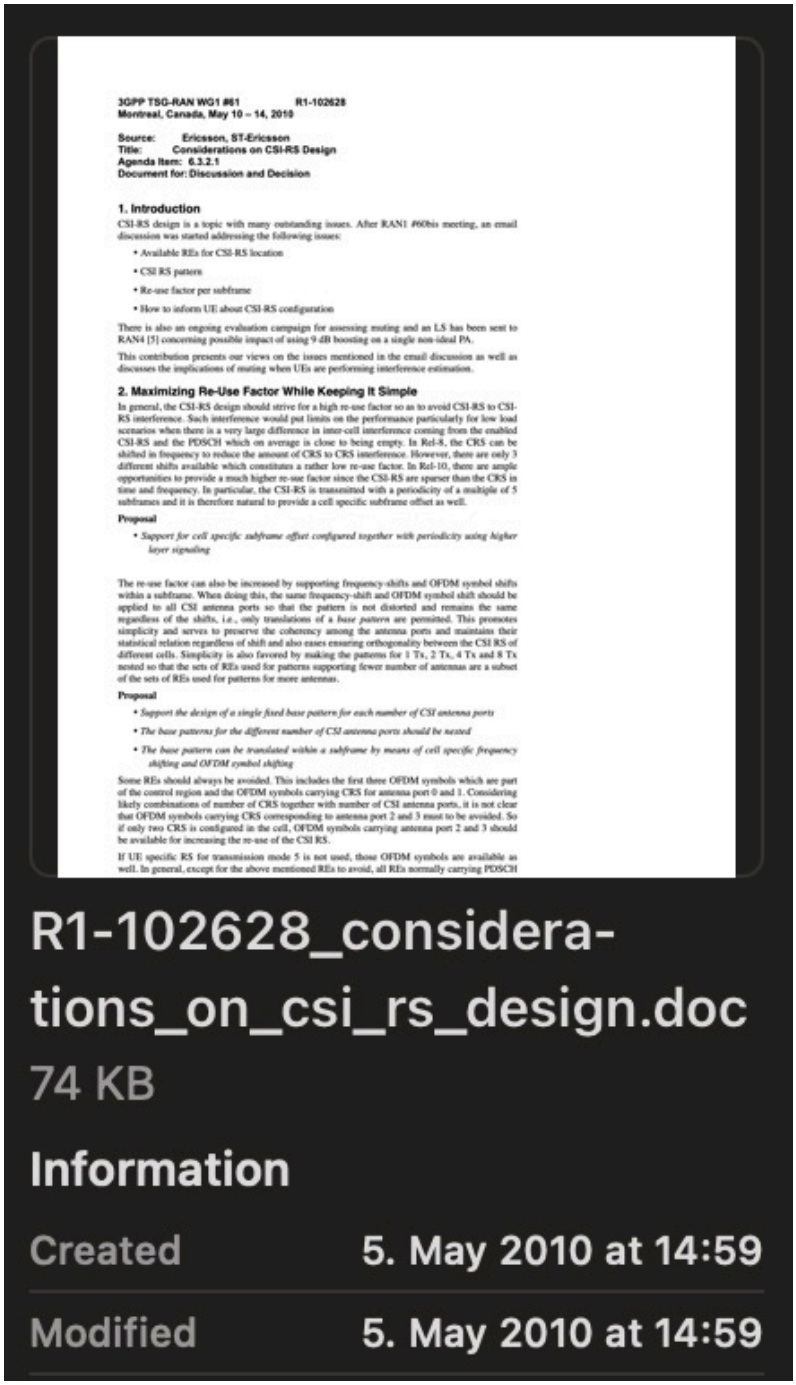
69. The public availability of the document is confirmed by the date stamp, May 5, 2010, shown on the historic 3GPP FTP server for the corresponding downloadable file ("R1-102628.zip"), as maintained by the Internet Archive at

https://web.archive.org/web/20140328154821/http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_61/Docs/. This information is also shown on the date stamp for the present-day listing of the same document on the 3GPP FTP server at https://www.3gpp.org/ftp/tsg_ran/wg1_rl1/TSGR1_61/Docs as shown in the screenshot below:



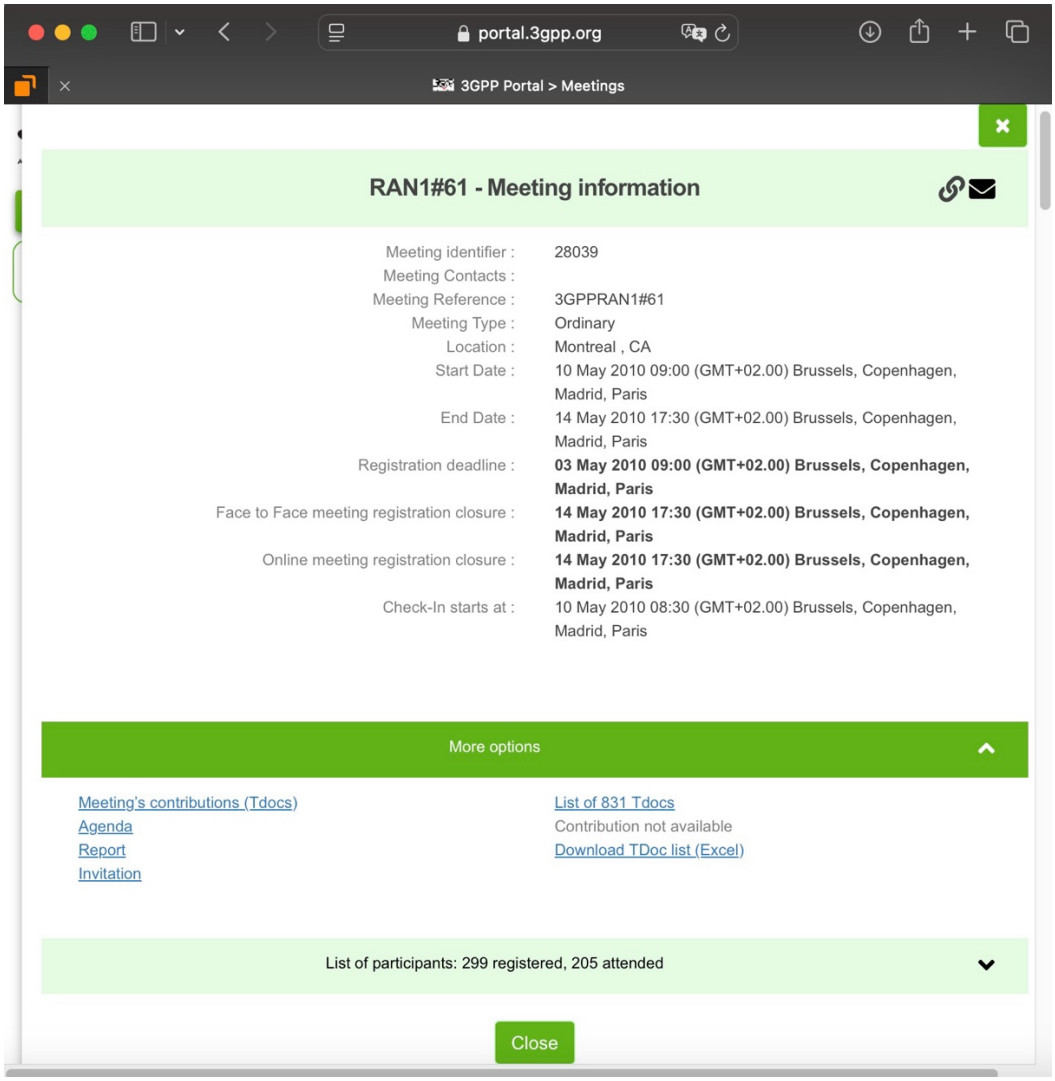
70. Experts in the field of determining the public availability of 3GPP documents would reasonably rely upon the FTP server upload date on the 3GPP FTP server as the date the document became available to the public.

71. In addition, metadata information for the downloaded and extracted TDoc file states a last "Modified" date of "5. May 2010," as shown in the screenshot below.



72. This last modified date is well aligned with the May 5, 2010, upload date of the document, and the standard business practice among 3GPP participants to upload submissions shortly after completing them.

73. The final meeting report of the RAN WG1 meeting #61 held on May 10-14, 2010, in Montreal, Canada, can be found in Appendix F. According to the 3GPP website at https://portal.3gpp.org/Meetings.aspx#/ which is shown in the screenshot below, that meeting was attended by 205 individuals (out of 299 registered participants):



74. The meeting report mentions R1-102628 on page 43 which clearly indicates that the document was registered for this meeting:

6.3.2.1 Intra-cell CSI-RS

Intra-cell CSI RS design

R1-102628	Considerations on CSI-RS design	Ericsson, ST-Ericsson	
R1-102655	Further investigation on intra-cell CSIRS	CATT	
R1-102721	Remaining Issues on Intra-cell CSI-RS Design	LG Electronics	

75. Furthermore, the meeting report includes in the zip file the meeting's document list of which an excerpt can be found in Appendix G[6]. R1-102628 is listed in row 34 and is tagged as "Available: Yes":

5	Available	Agenda Ite	Tdoc Number	Title	Source	Conclusion/Decision
34	Yes	6.3.2.1	R1-102628	Considerations on CSI-RS design	Ericsson, ST-Ericsson	Noted

76. Furthermore, the document was distributed via the 3GPP_TSG_RAN_WG1 email exploder on May 5, 2010, as shown in Appendix H. At about that time this email exploder had around 1313 subscribers as can be seen by the Internet Archive at https://web.archive.org/web/20100326093131/http://list.etsi.org/.

77. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, Ex. 1012 is an authentic copy of 3GPP TDoc R1-102628 that was uploaded and made available via the 3GPP FTP server to the general public by May 5, 2010, at the latest.

3. TDoc R1-104027

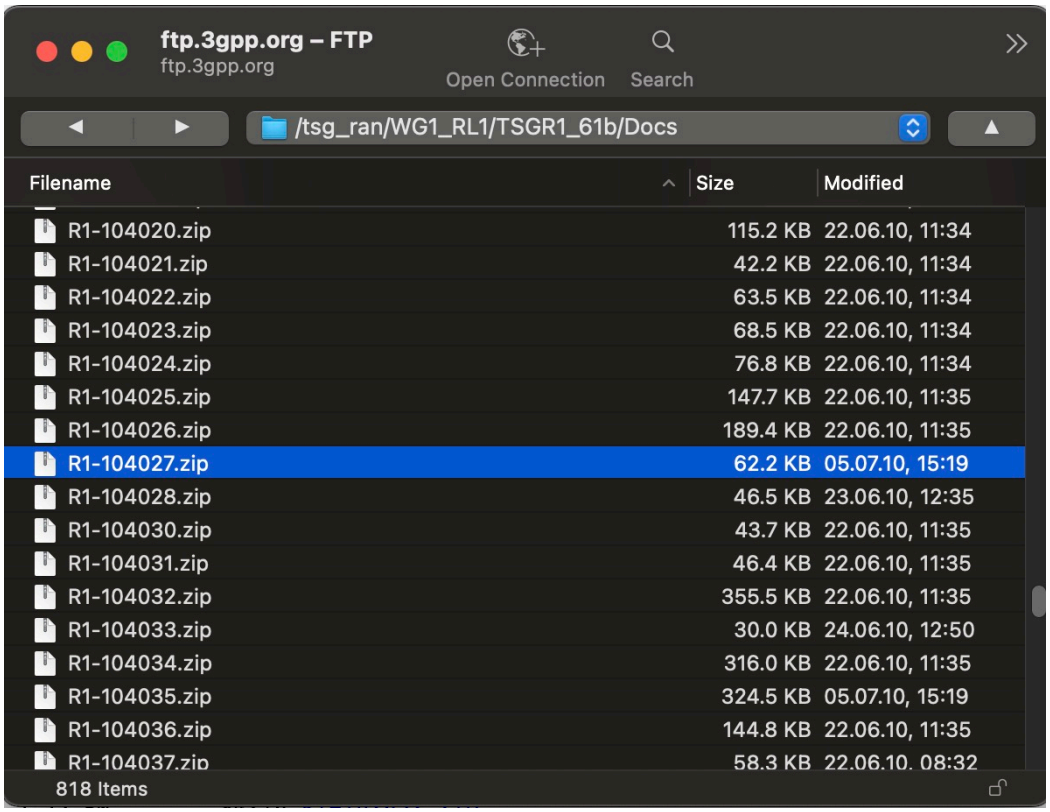
78. Based on my personal knowledge and my review of 3GPP's business records, I recognize Ex. 1011 as a true and correct copy of 3GPP TDoc R1-104027, which represents a 3GPP document with the title "E-mail discussion on PDSCH

[6] Given the size of the document list the Appendix only includes the columns relevant for this declaration.

muting for CSI RS design." The document was authored by NTT DOCOMO and discussed aspects of CSI-RS design in particular PDSCH muting.

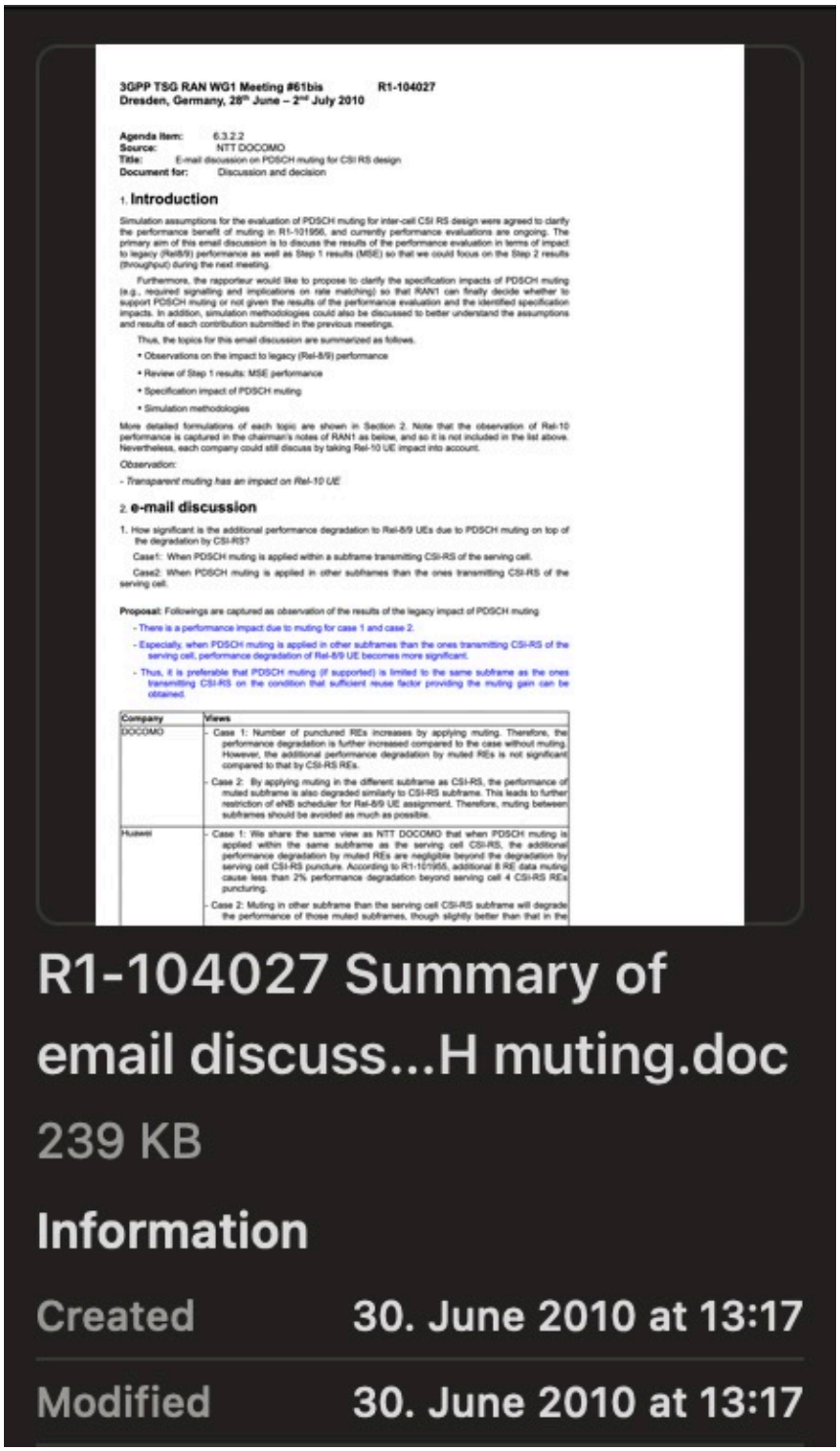
79. On its face, R1-104027 refers to the RAN WG1 meeting #61bis held on June 28 - July 2, 2010, in Dresden, Germany. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, this information tells me that R1-104027 was available either prior to or during or shortly after that meeting to all attending 3GPP members and to the general public.

80. The public availability of the document is confirmed by the date stamp, July 5, 2010, shown on the historic 3GPP FTP server for the corresponding downloadable file ("R1-104027.zip"), as maintained by the Internet Archive at https://web.archive.org/web/20140328144651/http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_61b/Docs/. This information is also shown on the date stamp for the present-day listing of the same document on the 3GPP FTP server at https://www.3gpp.org/ftp/tsg_ran/wg1_rl1/TSGR1_61b/Docs as shown in the screenshot below:



81. Experts in the field of determining the public availability of 3GPP documents would reasonably rely upon the FTP server upload date on the 3GPP FTP server as the date the document became available to the public.

82. In addition, metadata information for the downloaded and extracted TDoc file states a last "Modified" date of "30. June 2010," as shown in the screenshot below.



3GPP TSG RAN WG1 Meeting #61bis R1-104027
Dresden, Germany, 28th June – 2nd July 2010

Agenda item: 6.3.2.2
Source: NTT DOCOMO
Title: E-mail discussion on PDSCH muting for CSI RS design
Document for: Discussion and decision

1. Introduction

Simulation assumptions for the evaluation of PDSCH muting for inter-cell CSI RS design were agreed to clarify the performance benefit of muting in R1-101956, and currently performance evaluations are ongoing. The primary aim of this email discussion is to discuss the results of the performance evaluation in terms of impact to legacy (Rel8/9) performance as well as Step 1 results (MSE) so that we could focus on the Step 2 results (throughput) during the next meeting.

Furthermore, the rapporteur would like to propose to clarify the specification impacts of PDSCH muting (e.g., required signalling and implications on rate matching) so that RAN1 can finally decide whether to support PDSCH muting or not given the results of the performance evaluation and the identified specification impacts. In addition, simulation methodologies could also be discussed to better understand the assumptions and results of each contribution submitted in the previous meetings.

Thus, the topics for this email discussion are summarized as follows.

- Observations on the impact to legacy (Rel-8/9) performance
- Review of Step 1 results: MSE performance
- Specification impact of PDSCH muting
- Simulation methodologies

More detailed formulations of each topic are shown in Section 2. Note that the observation of Rel-10 performance is captured in the chairman's notes of RAN1 as below, and so it is not included in the list above. Nevertheless, each company could still discuss by taking Rel-10 UE impact into account.

Observation:

- Transparent muting has an impact on Rel-10 UE

2. e-mail discussion

1. How significant is the additional performance degradation to Rel-8/9 UEs due to PDSCH muting on top of the degradation by CSI-RS?

Case1: When PDSCH muting is applied within a subframe transmitting CSI-RS of the serving cell.

Case2: When PDSCH muting is applied in other subframes than the ones transmitting CSI-RS of the serving cell.

Proposal: Followings are captured as observation of the results of the legacy impact of PDSCH muting

- There is a performance impact due to muting for case 1 and case 2.
- Especially, when PDSCH muting is applied in other subframes than the ones transmitting CSI-RS of the serving cell, performance degradation of Rel-8/9 UE becomes more significant.
- Thus, it is preferable that PDSCH muting (if supported) is limited to the same subframe as the ones transmitting CSI-RS on the condition that sufficient reuse factor providing the muting gain can be obtained.

Company	Views
DOCOMO	- Case 1: Number of punctured REs increases by applying muting. Therefore, the performance degradation is further increased compared to the case without muting. However, the additional performance degradation by muted REs is not significant compared to that by CSI-RS REs. - Case 2: By applying muting in the different subframe as CSI-RS, the performance of muted subframe is also degraded similarly to CSI-RS subframe. This leads to further restriction of eNB scheduler for Rel-8/9 UE assignment. Therefore, muting between subframes should be avoided as much as possible.
Huawei	- Case 1: We share the same view as NTT DOCOMO that when PDSCH muting is applied within the same subframe as the serving cell CSI-RS, the additional performance degradation by muted REs are negligible beyond the degradation by serving cell CSI-RS puncture. According to R1-101956, additional 8 RE data muting cause less than 2% performance degradation beyond serving cell 4 CSI-RS REs puncturing. - Case 2: Muting in other subframe than the serving cell CSI-RS subframe will degrade the performance of those muted subframes, though slightly better than that in the

R1-104027 Summary of email discuss...H muting.doc

239 KB

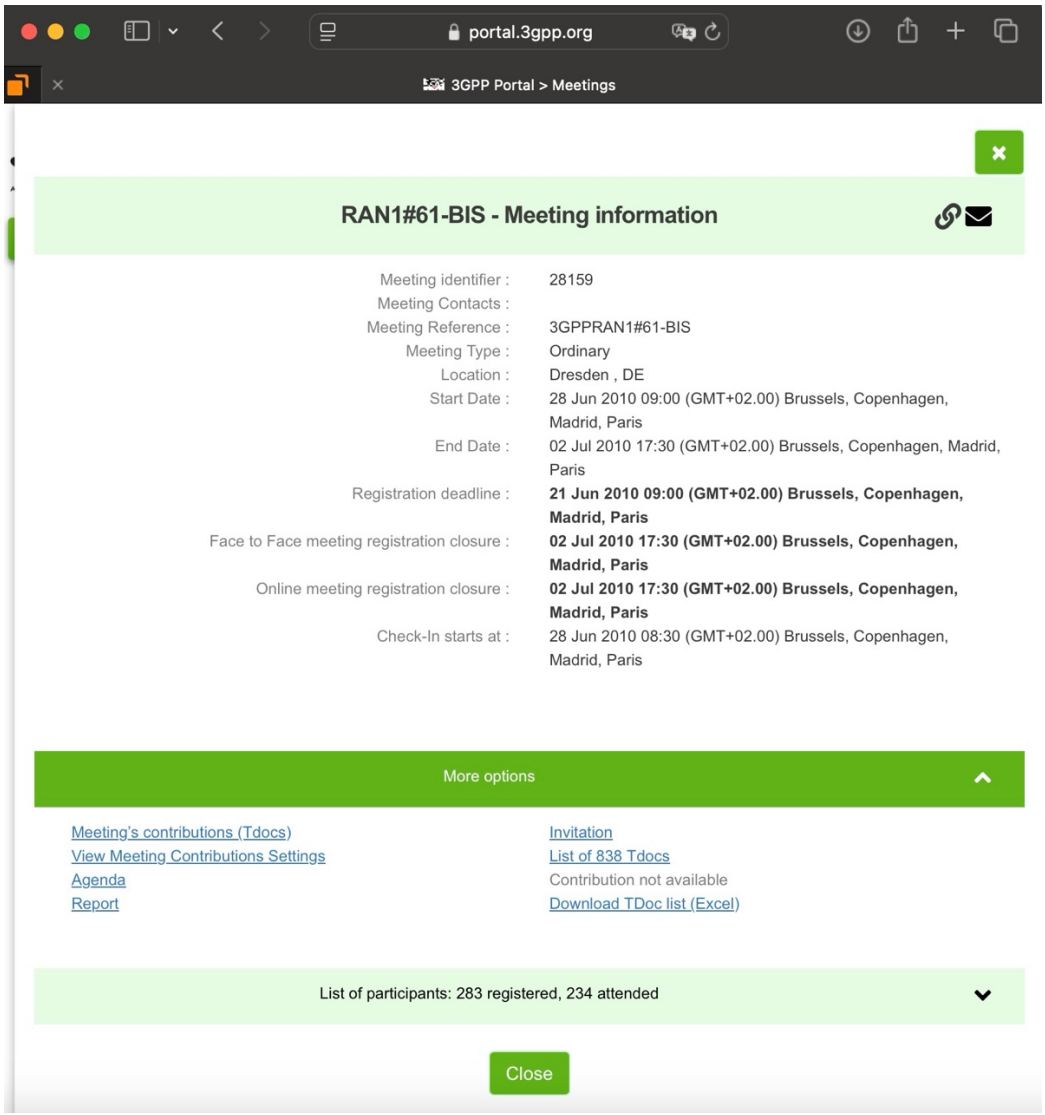
Information

Created 30. June 2010 at 13:17

Modified 30. June 2010 at 13:17

83. This last modified date is well aligned with the July 05, 2010, upload date of the document, and the standard business practice among 3GPP participants to upload submissions shortly after completing them.

84. The final meeting report of the RAN WG1 meeting 61bis held on June 28 - July 2, 2010, in Dresden, Germany, can be found in Appendix C. According to the 3GPP website at https://portal.3gpp.org/Meetings.aspx#/ which is shown in the screenshot below, that meeting was attended by 234 individuals (out of 283 registered participants):



85. The meeting report mentions R1-104027 on page 47 which clearly indicates that the document was registered for this meeting. As can be seen at the screenshot below, the document was presented and "noted":

6.3.2.2 Muting

R1-104027	Summary of email discussion on PDSCH muting	NTT DOCOMO	

47

3GPP TSG RAN WG1 Meeting #62 **R1-10xxxx**
Madrid, Spain, 23 – 27 August, 2010

The document was presented by Tetsushi Abe from NTT DoCoMo and provides the outcomes of email discussion [61-03-LTE-A].
Decision: The document is noted.

86. Furthermore, the meeting report includes in the zip file the meeting's document list of which an excerpt can be found in Appendix D[7]. R1-104027 is listed in row 603 and is tagged as "Available: Yes":

	A	B	D	E	F	H
5	Available	Agenda Item	Tdoc Number	Title	Source	Conclusion/Decision
603	Yes	6.3.2.2	R1-104027	Summary of email discussion on PDSCH muting	NTT DOCOMO	Noted

87. Furthermore, the document was distributed via the 3GPP_TSG_RAN_WG1 email exploder on June 30, 2010, as shown in Appendix I. At about that time this email exploder had around 1313 subscribers as can be seen by the Internet Archive at https://web.archive.org/web/20100326093131/http://list.etsi.org/.

[7] Given the size of the document list the Appendix only includes the columns relevant for this declaration.

88. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, Ex. 1011 is an authentic copy of 3GPP TDoc R1-104027 that was uploaded and made available via the 3GPP FTP server to the general public by July 5, 2010, at the latest.

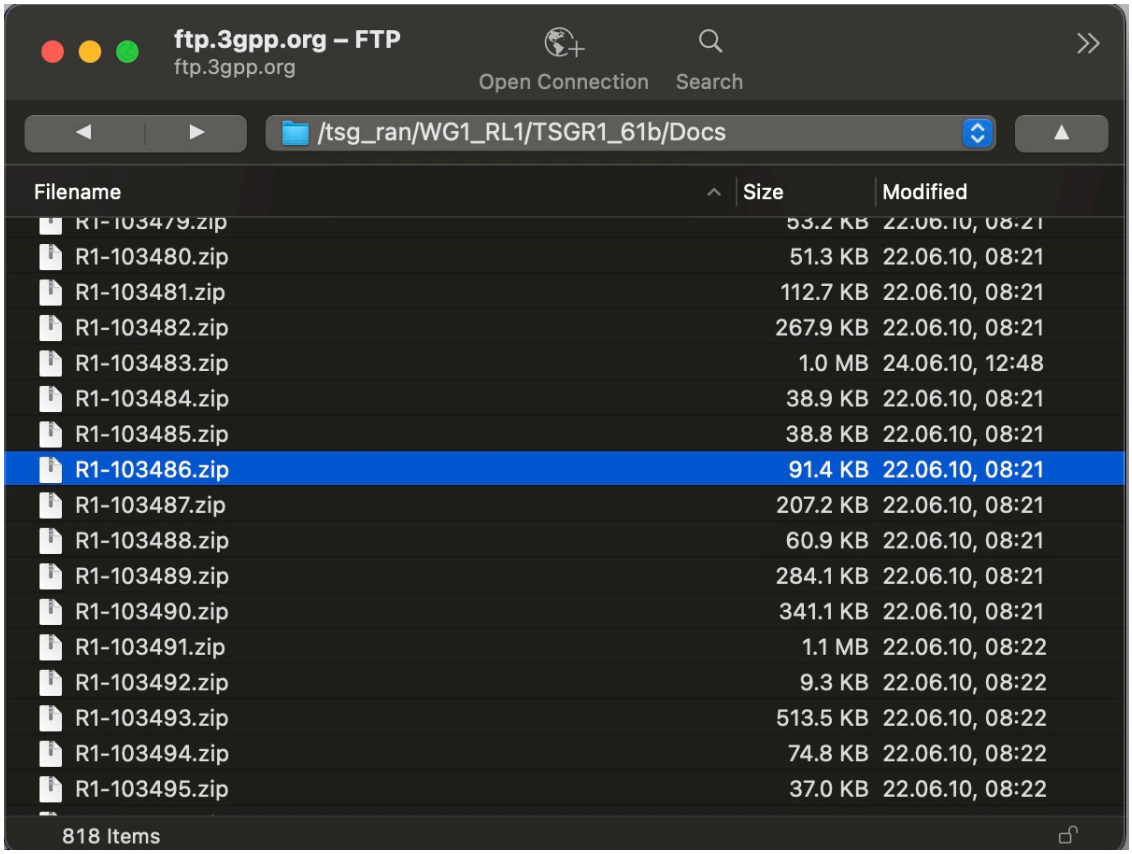
4. TDoc R1-103486

89. Based on my personal knowledge and my review of 3GPP's business records, I recognize Ex. 1010 as a true and correct copy of 3GPP TDoc R1-103486, which represents a 3GPP document with the title "On aperiodic SRS Transmission in LTE-A." The document was authored by CATT and discussed issues of aperiodic SRS transmission in LTE-A.

90. On its face, R1-103486 refers to the RAN WG1 meeting #61bis held on June 28 - July 2, 2010, in Dresden, Germany. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, this information tells me that R1-103486 was available either prior to or during or shortly after that meeting to all attending 3GPP members and to the general public.

91. The public availability of the document is confirmed by the date stamp, June 22, 2010, shown on the historic 3GPP FTP server for the corresponding downloadable file ("R1-103486.zip"), as maintained by the Internet Archive at https://web.archive.org/web/20140328144651/http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_61b/Docs/. This information is also shown on the date stamp for the

present-day listing of the same document on the 3GPP FTP server at https://www.3gpp.org/ftp/tsg_ran/wg1_rl1/TSGR1_61b/Docs as shown in the screenshot below:



92. Experts in the field of determining the public availability of 3GPP documents would reasonably rely upon the FTP server upload date on the 3GPP FTP server as the date the document became available to the public.

93. In addition, metadata information for the downloaded and extracted TDoc file states a last "Modified" date of "22. June 2010," as shown in the screenshot below.



3GPP TSG RAN WG1 Meeting #61bis R1-103486
Dresden, Germany, 28th June – 2nd July 2010

Source: CATT
Title: On aperiodic SRS Transmission in LTE-A
Agenda Item: 6.5.2.1
Document for: Discussion and Decision

1. Introduction

In LTE-A, antenna-specific sounding should be supported for multi-antenna UEs. In this case, semi-static scheduled SRS will incur more SRS resource overhead. To improve the efficiency of SRS resources in LTE-A, the enhancement of SRS via aperiodic SRS had been supported and the details were discussed in the last meetings. In RAN1 #61 meeting, some agreements were reached as follows:

- *One-shot SRS transmission is supported.*
- *In case of DCI format 0 is used for SRS triggering, size of DCI format 0 remains the same as defined in Rel8 at least in common search space*
- *Continue email discussion until RAN1#61bis*
  - *Support of other SRS durations is FFS*
  - *Resources used for aperiodic SRS*
  - *Support of aperiodic triggering by DL grant?*
  - *In case of UL triggering, allow triggering without PUSCH grant?*
  - *Support of group triggering*

In this contribution, we further discuss the remaining issues above on aperiodic SRS transmission in LTE-A.

2. Triggering of aperiodic SRS

In our view, an important motivation to introduce aperiodic SRS is to reduce the overhead of periodic SRS. If aperiodic SRS can be scheduled dynamically and flexibly, the transmission of periodic SRS can be greatly reduced, and even single port SRS or long-periodic antenna-specific SRS is enough for periodic SRS in most scenarios. In this case, the SRS resources in LTE-A will be more sufficient even without additional enhancement. For this purpose, the flexibility of aperiodic SRS should be ensured as much as possible in scheduling and resource configuration, also taking specification impact into count.

SRS triggering via UL grant, which was agreed in RAN1 #60bis, is a straightforward way for scheduling aperiodic SRS. From the view of scheduling, one triggering IE in DCI message is efficient enough. The PDCCH overhead is hard to accept if a specific UL grant is introduced for SRS resources configuration or just SRS triggering, especially when there are considerable requests for aperiodic SRS. Instead, simultaneous triggering of a group of UEs via a new DCI similar to format 3/3A can be considered to minimize the PDCCH overhead. However, it is uncertain that how many UEs in a semi-static UE-group need to send aperiodic SRS at one time, which results in the uncertain efficiency with this type of triggering.

Dynamic aperiodic scheduling via DL assignments was also discussed in the last meeting. In our view, it is beneficial for aperiodic triggering at least in the following aspects:

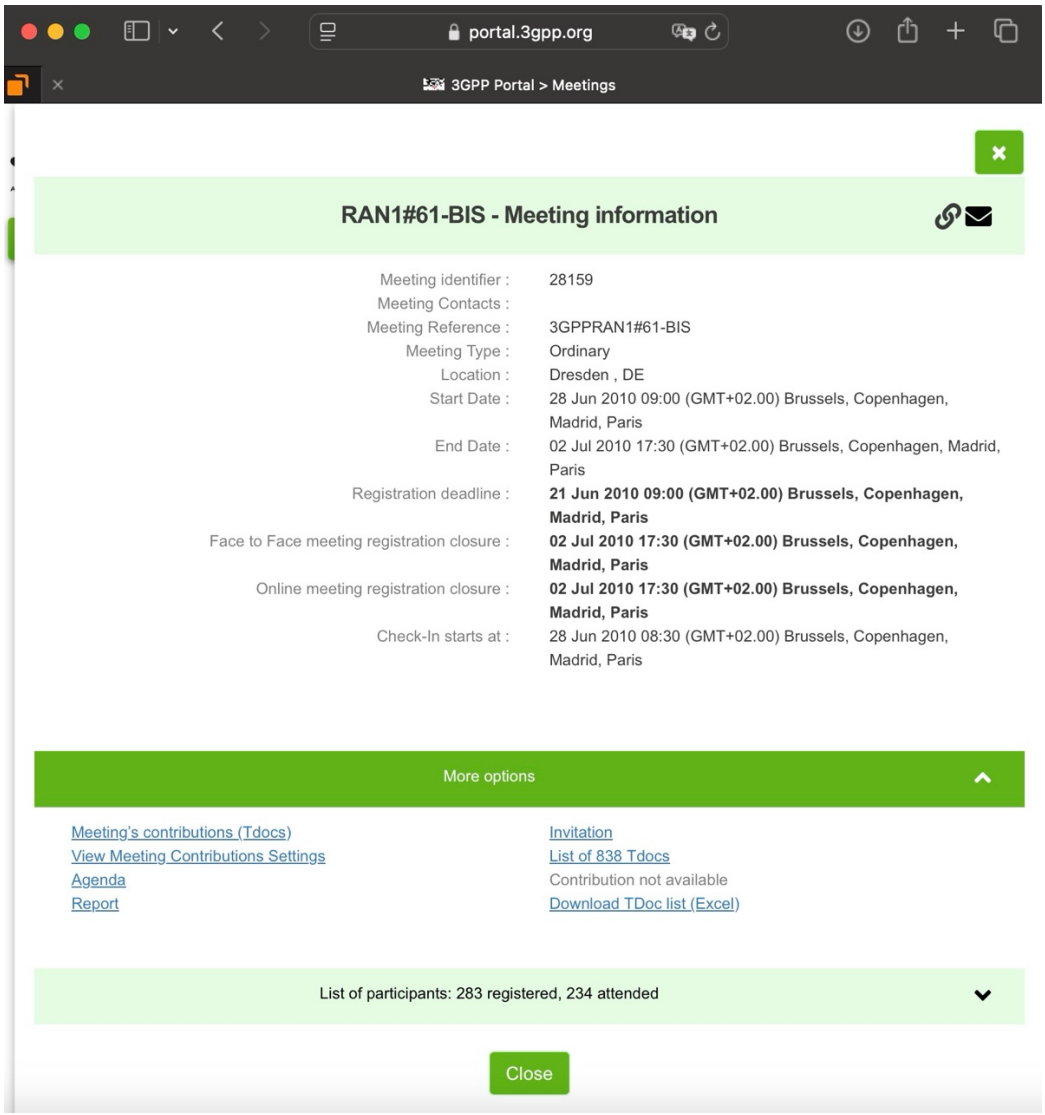
- It provides the capability of frequency-selective scheduling and accurate PMI/CQI for the first transmission(s) or sporadic transmission(s), which is unavailable via UL triggering. In LTE R8, frequency-selective scheduling is useless. But for UL MIMO transmission, especially for spatial multiplexing, accurate scheduling and PMI/CQI indication will provide additional performance gain. It is useful in many application scenarios with sporadic UL transmission when short-delay periodic SRS is unavailable.
- This type of triggering can reduce the delay of aperiodic SRS. As results shown in [1], UL MIMO transmission with spatial multiplexing is more sensitive to sounding accuracy than SIMO transmission in Rel-8. If the SRS delay gets smaller, the performance can be improved. With only UL triggering, the SRS delay is hard to ensure because the PUSCH scheduling is difficult to match the resource for aperiodic SRS, in case SRS resource is configured via higher layer signaling. A particular example is shown in figure 1, in which the aperiodic SRS is transmitted 9ms after triggering.

Figure1: An example of triggering and transmission of aperiodic SRS

R1-103486.doc
229 KB
Information
Created 22. June 2010 at 12:40
Modified 22. June 2010 at 12:40

94. This last modified date is well aligned with the June 22, 2010, upload date of the document, and the standard business practice among 3GPP participants to upload submissions shortly after completing them.

95. The final meeting report of the RAN WG1 meeting 61bis held on June 28 - July 2, 2010, in Dresden, Germany, can be found in Appendix C. According to the 3GPP website at https://portal.3gpp.org/Meetings.aspx#/ which is shown in the screenshot below, that meeting was attended by 234 individuals (out of 283 registered participants):



96. The meeting report mentions R1-103486 on page 68 which clearly indicates that the document was registered for this meeting. As can be seen at the screenshot below, the document was listed amongst documents which were "Not treated" (likely due to lack of meeting time):

Not treated.

R1-103486	On aperiodic SRS transmission in LTE-A	CATT
R1-103519	Further details on aperiodic sounding reference signals	Ericsson. ST-Ericsson
R1-103554	Further details on aperiodic dynamic SRS	Qualcomm Incorporated

97. Furthermore, the meeting report includes in the zip file the meeting's document list of which an excerpt can be found in Appendix D[8]. R1-103486 is listed in row 62 and is tagged as "Available: Yes":

	A	B	D	E	F	H
5	Available	Agenda Item	Tdoc Number	Title	Source	Conclusion/Decision
62	Yes	6.5.2.1	R1-103486	On aperiodic SRS transmission in LTE-A	CATT	Not treated

98. Furthermore, the document was distributed via the 3GPP_TSG_RAN_WG1 email exploder on June 22, 2010, as shown in Appendix J. At about that time this email exploder had around 1313 subscribers as can be seen by the Internet Archive at https://web.archive.org/web/20100326093131/http://list.etsi.org/.

99. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, Ex. 1010 is an authentic copy of 3GPP TDoc R1-103486 that was uploaded and made available via the 3GPP FTP server to the general public by June 22, 2010, at the latest.

[8] Given the size of the document list the Appendix only includes the columns relevant for this declaration.

5. TDoc R1-103657

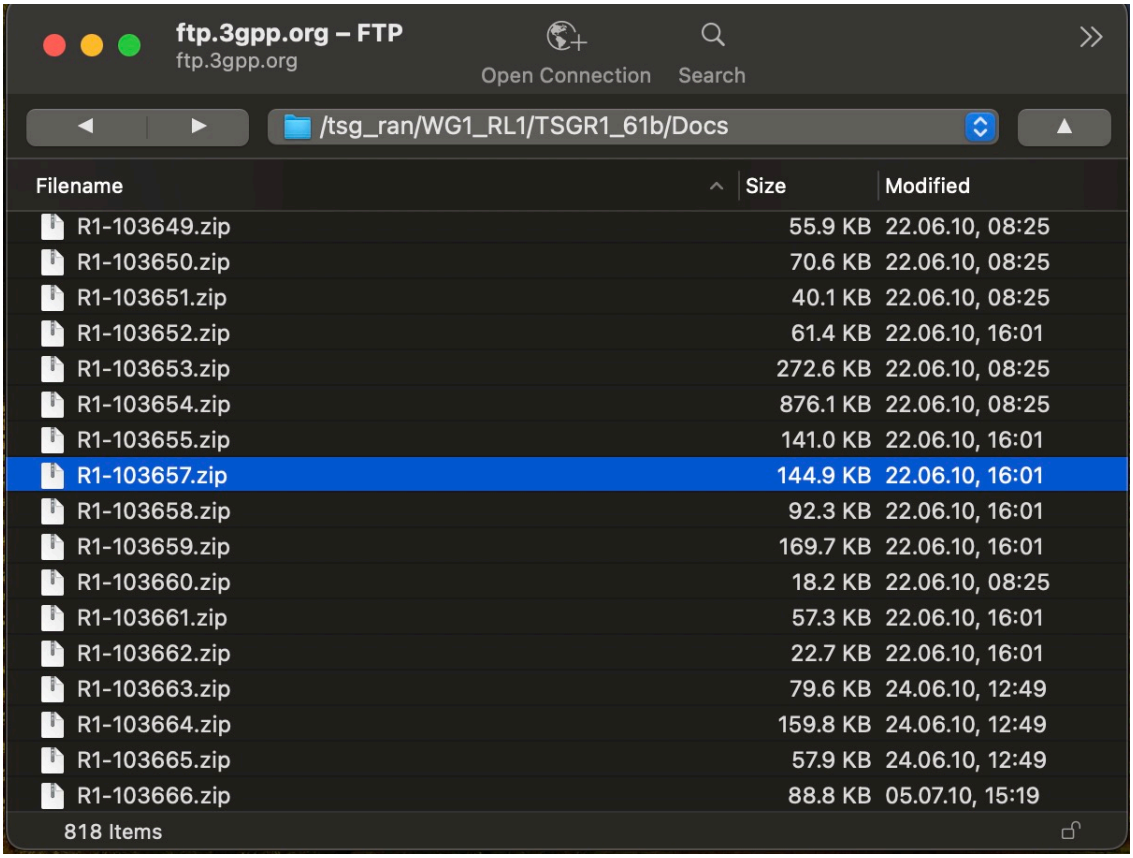
100. Based on my personal knowledge and my review of 3GPP's business records, I recognize Ex. 1018 as a true and correct copy of 3GPP TDoc R1-103657, which represents a 3GPP document with the title "Discussion on the overhead of muting." The document was authored by Samsung and investigated the performance impact of PDSCH muting and discussed different alternatives for controlling the overhead of PDSCH muting.

101. On its face, R1-103657 refers to the RAN WG1 meeting #61bis[9] held on June 28 - July 2, 2010, in Dresden, Germany. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, this information tells me that R1-103657 was available either prior to or during or shortly after that meeting to all attending 3GPP members and to the general public.

102. The public availability of the document is confirmed by the date stamp, June 22, 2010, shown on the historic 3GPP FTP server for the corresponding downloadable file ("R1-103657.zip"), as maintained by the Internet Archive at https://web.archive.org/web/20140328144651/http://3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_61b/Docs/. This information is also shown on the date stamp for the present-day listing of the same document on the 3GPP FTP server at

[9] The TDoc header shows "#60bis" which is a typographical error.

https://www.3gpp.org/ftp/tsg_ran/wg1_rl1/TSGR1_61b/Docs as shown in the screenshot below:



103. Experts in the field of determining the public availability of 3GPP documents would reasonably rely upon the FTP server upload date on the 3GPP FTP server as the date the document became available to the public.

104. In addition, metadata information for the downloaded and extracted TDoc file states a last "Modified" date of "22. June 2010," as shown in the screenshot below.



3GPP TSG RAN WG1 #60bis *R1-103657*
Dresden, Germany, June 28 – July 2, 2010

Agenda item: 6.3.2.2

Source: Samsung

Title: Discussion on the overhead of muting

Document for: Discussion / Decision

1 Introduction

In RAN1#60, the following were agreed with respect to PDSCH RE muting for inter-cell CSI-RS [1]:

- *Study RE muting, i.e., no collision between CSIRS and data, for multi-cell CSI measurement*
  - *Consider the impact of muting on UE interference measurement*
  - *Consider the impact on Rel-8 UE*
  - *Power reallocation of muted REs is FFS*

Currently, there is an ongoing RAN1 evaluation of RE muting to investigate the impacts on Rel.8 UEs and the performance of Rel.10 UEs. However, in the evaluation, muting schemes other than full muting where the PDSCH is turned off on all the CSI-RS locations other than the one used by the serving cell are not considered. While such an approach allows a significant improvement on the channel measurement based on the CSI-RS, it incurs a severe overhead on PDSCH since a large portion of the bandwidth has to be sacrificed. Therefore, if muting is to be adopted for LTE-A, we propose that the means to control the overhead incurred by muting be adopted as well. In this contribution, we investigate the performance impact of PDSCH muting and discuss different alternatives for controlling the overhead of PDSCH muting.

2 PDSCH RE muting

2.1 Full muting

In this contribution, we define full muting as the case where PDSCH muting is performed in the following way:

- Muting is applied with the same periodicity as the CSI-RS
- Muting is applied for all PRB pairs
- Given a CSI-RS reuse factor of *N*, muting is applied for on *N*-1 CSI-RS resources.
- Muting is applied for all PDSCH REs coinciding with neighbouring cell's CSI-RS antenna ports.

Although full muting may be beneficial for the channel measurement process, we need to carefully study its impact on the PDSCH.

2.2 Partial muting

The overhead of PDSCH muting can be controlled by applying muting for a subset of CSI-RS transmissions from neighbouring cells. In this contribution, the term 'partial muting' will be used to differentiate such a muting scheme from full muting. Following are the possible options:

- Partial muting in time domain
  - Muting is applied with larger periodicity compared to the CSI-RS transmission from other eNBs.
- Partial muting in frequency domain
  - Muting is not applied in every PRB in frequency domain.
- Partial muting within different CSI-RS patterns
  - For a CSI-RS reuse factor of *N*, not all *N*-1 CSI-RS resources use by adjacent cells are muted off.
- Partial muting within antenna ports
  - Apply muting for only a subset of antenna ports used by adjacent cells.

Note that partial muting may be implemented by utilizing only one of the above options or by combining two or more options. For example, partial muting in the time domain can be used

R1-103657.doc

Microsoft Word 97 - 2004 docum...

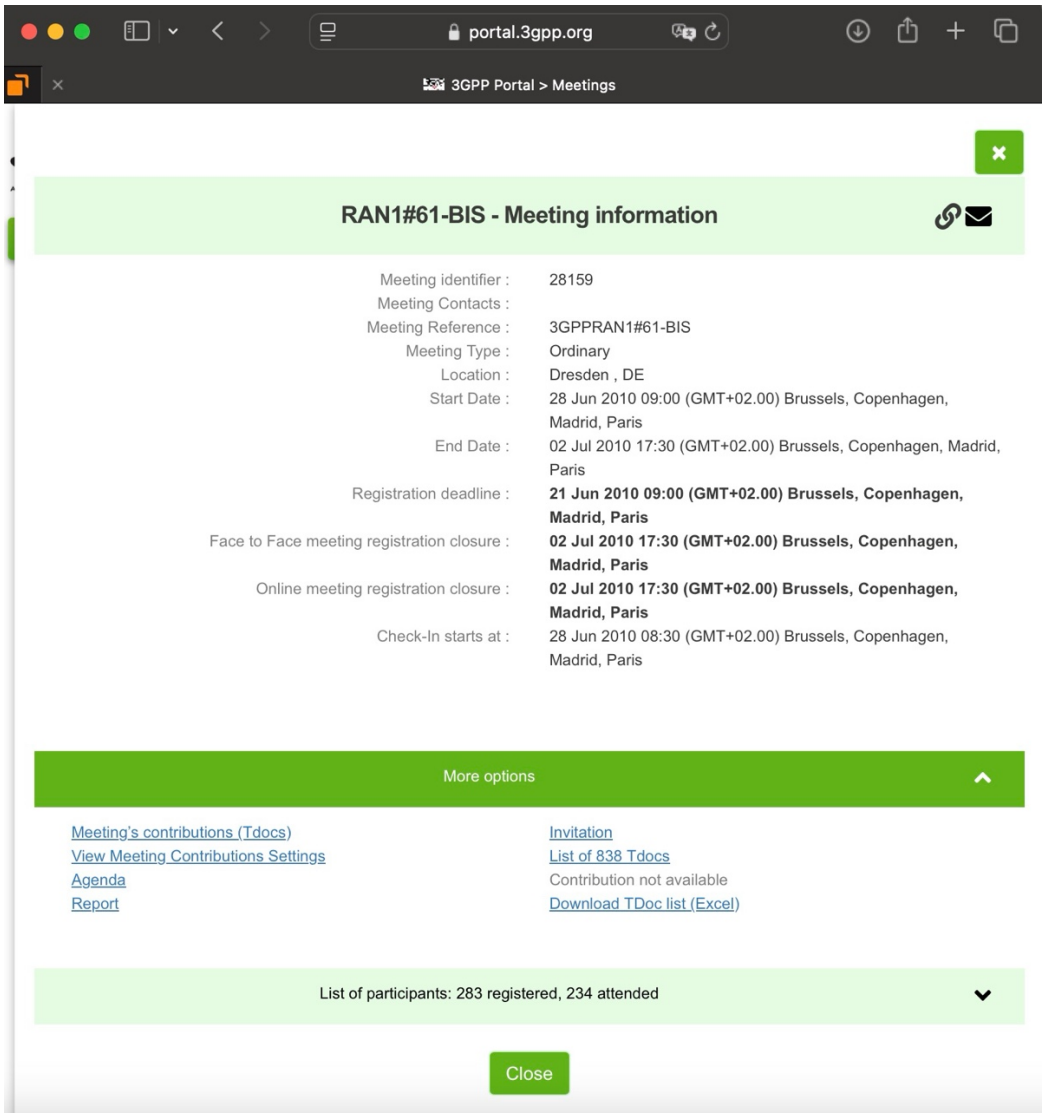
Information

Created 22. June 2010 at 16:30

Modified 22. June 2010 at 16:30

105. This last modified date is well aligned with the June 22, 2010, upload date of the document, and the standard business practice among 3GPP participants to upload submissions shortly after completing them.

106. The final meeting report of the RAN WG1 meeting 61bis held on June 28 - July 2, 2010, in Dresden, Germany, can be found in Appendix C. According to the 3GPP website at https://portal.3gpp.org/Meetings.aspx#/ which is shown in the screenshot below, that meeting was attended by 234 individuals (out of 283 registered participants):



107. The meeting report mentions R1-103657 on page 48 which clearly indicates that the document was registered for this meeting. As can be seen at the screenshot below, the document was tagged as "noted":

R1-103657	Discussion on the overhead of muting	Samsung
Decision: The document is noted.		

108. Furthermore, the meeting report includes in the zip file the meeting's document list of which an excerpt can be found in Appendix D[10]. R1-103657 is listed in row 233 and is tagged as "Available: Yes":

	A	B	D	E	F	H
5	Available	Agenda Item	Tdoc Number	Title	Source	Conclusion/Decision
233	Yes	6.3.2.2	R1-103657	Discussion on the overhead of muting	Samsung	Noted

109. Furthermore, the document was distributed via the 3GPP_TSG_RAN_WG1 email exploder on June 22, 2010, as shown in Appendix K. At about that time this email exploder had around 1313 subscribers as can be seen by the Internet Archive at https://web.archive.org/web/20100326093131/http://list.etsi.org/.

110. Thus, based on my personal knowledge and experience with ETSI's and 3GPP's standard business practices, Ex. 1018 is an authentic copy of 3GPP TDoc R1-103657 that was uploaded and made available via the 3GPP FTP server to the general public by June 22, 2010, at the latest.

V. AVAILABILITY FOR CROSS-EXAMINATION

111. In signing this declaration, I recognize that the declaration may be filed as evidence in a contested case before the Patent Trial and Appeal Board of the

[10] Given the size of the document list the Appendix only includes the columns relevant for this declaration.

United States Patent and Trademark Office. I also recognize that I may be subject to cross examination in the case and that cross examination will take place within the United States. If cross examination is required of me, I will cooperate to the best of my ability to appear for cross examination within the United States during the time allotted for cross examination.

A. Right To Supplement

112. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises and to take into account new information as it becomes available to me.

B. Signature

113. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

114. I declare under penalty of perjury that the foregoing is true and correct.

Dated: April 30, 2025



Friedhelm Rodermund

Appendix A

CURRICULUM VITAE

I. PERSONAL DATA

Name: **Friedhelm RODERMUND**

Mailing address: Am Steiner Graben 18
56077 Koblenz, Germany

Phone: +49 172 2606489

Email: fred@iotecc.com

II. PROFESSIONAL EXPERIENCE

Summary

Senior expert in telecommunications and Internet of Things (IoT) technology. 25 years of experience within the mobile communications industry, and several years in the IoT domain in various roles such as project management, technology innovation and evolution, standards development, technology strategy, patent creation and patent litigations, and development/introduction of new services.

Recognized standards expert who was actively involved in leading roles in the development of key standards for mobile telephony/data and service anablers across standards development organizations such as 3GPP, ETSI, GSMA, IETF, OMA, and oneM2M. Currently focussing on standards for the Internet of Things including ETSI and 3GPP standards such as 5G and 6G, and OMA Lightweight M2M (LwM2M).

Founder and director of IOTECC GmbH which provides consulting services around technologies and standards enabling the Internet of Things, and consulting and expert services related to patents for mobile telcommunications and IoT.

01/2015 – present **IOTECC GmbH** **Koblenz, Germany**

Founder and CEO

- Mobile telecommunications, Internet of Things (IoT) technology and standards consulting
- Telecommunications and IoT patent consulting
  - Consulting services around telecommunications and IoT patents in particular related to 3GPP, ETSI and OMA standards
  - State of the art/prior art research services related to patent filing e.g. for 5G and 6G
  - Prior art research, essentiality assessment, patent infringement analysis related to litigations and validity actions
  - Advising on IP strategy
  - Advising on Standards Development Organisations (SDO) e.g. ETSI and 3GPP working processes and IPR policy
  - Conducting seminar on Standards Essential Patents (SEPs) for the Internet of Things at the Technical University of Ilmenau, Germany
  - Experienced expert witness (please see section III for a list of supported actions)

11/2014 – 12/2014 **Friedhelm Rodermund Consulting** **Koblenz, Germany**

Internet of Things (IoT) Consultant

- IoT standards development and introduction of new IoT services

01/2011 – 10/2014 **Vodafone Germany / Vodafone Group R&D** **Düsseldorf, Germany**

Senior Standards Strategist
- Representing Vodafone in various standardisation bodies
- Creating technical standards for the Internet of Things
- Work item lead, technical editor and key contributor of Open Mobile Alliance (OMA) "Lightweight M2M (LwM2M)" – the new standard for the Internet of Things
- Advising and supporting various IoT/M2M projects related to e.g. smart metering
- Advising on the introduction of new IoT/M2M technologies and services
- Leading Proof of Concepts of emerging technologies
- Involved in innovation projects
- Supporting the creation and protection of Intellectual Property

01/2009 – 12/2010 **Vodafone Germany** **Düsseldorf, Germany**

Vice Chairman Open Mobile Alliance (OMA) Device Management (DM)
- Responsible for Vodafone's Device Management standardisation
- As OMA DM Vice Chairman, co-leading the group, chairing committee meetings and web conferences, steering the technical direction, management of the different work items
- Editor of several specifications, rapporteur of various work items
- Support of projects for the introduction of device management
- Delegate to 3GPP SA1 with responsiblity for the introduction of MTC (machine type communications) related service/network requirements

01/2005 – 12/2008 **Vodafone Germany** **Düsseldorf, Germany**

Project Manager Mobile Broadcast Standards
- Responsible for Mobile Broadcast standardisation across different broadcast systems/standards bodies and across all Vodafone local operations
- Responsible for Mobile Broadcast standardisation strategy development and implementation
- Delegation Lead for the Open Mobile Alliance (OMA) BCAST working group
- Initiated and managed the BCAST device profile development in the BMCO Forum
- Leading the "Service Protection" (pay-TV) stream of the German DVB-H Consortium
- Filed several patents
- Supporting patent litigations and patent portfolio evaluation (various technical areas)

04/2003 – 12/2003 **GSM Association** **London, United Kingdom**

Member of the MMS Task Force
- Verification of the MMS operator interworking framework
- Supporting the definition and specification of the MMS functional evolution
- Acting as a "link" between 3GPP and GSMA in the area of MMS

06/1998 – 12/2004 **European Telecommunications Standards Institute (ETSI)**
Sophia Antipolis, France

01/2002 – 12/2004: Secretary 3GPP Technical Specifications Group *"Terminals"* and Terminals Working Group 2 *"Terminal Services and Capabilities"*

01/1999 – 12/2001: Secretary 3GPP Terminals Working Group 2 *"Terminal Services and Capabilities"* and GERAN 3 *"Base Station Testing"*

06/1998 – 03/1999: Secretary ETSI SMG4 *"Data Services"* and SMG8 *"Base Station Testing"*

- Supported the establishment of 3GPP (3rd Generation Partnership Project) as the leading standards organization for mobile telecommunications
- Project manager and secretary of TSG "Terminals" reponsbile for Terminal Conformance Testing, Terminal Services and Capabilities, Universal Subscriber Identity Module (USIM)
- Project manager and secretary of Terminals Working Group 2 "Terminal Services and Capabilities" that was responsible for Terminal Execution Environments, Messaging including Short Message Service (SMS), Cell Broadcast Service (CBS), Enhanced Messaging Service (EMS), Multimedia Messaging Service (MMS), Terminal Interfaces incl. AT-commands, Generic User Profile, Data Synchronization and others
- Establishment and management of the Work Plan and follow-up and report on the progress of the related work items
- Advising the chairmen and the standards groups on technical, procedural and political issues
- Editorship of various GSM and UMTS technical specifications
- Responsible for presenting the technical results of the working groups to the parent body
- Responsible for the communication with other standards bodies inside and outside 3GPP
- PR activities (articles, interviews)

12/1993 – 06/1998 Mannesmann Mobilfunk GmbH Düsseldorf, Germany

System Engineer and Project Manager in Quality Assurance and Technical Standards

- Leadership and management of acceptance test projects in the area of GSM Base Station Controller (BSC) and GSM Base Station (BTS) hardware and software.
- Leading project teams of around 15 people
- Responsible for the clearance of releasing new software/hardware into the network
- Supported Request for Quotations, supplier evaluation and pre-selection, project manager of System Verification as a central part of the supplier selection process.
- Representation of Mannesmann Mobilfunk to the ETSI standardization group "Standardization Technical Committee SMG3 System Architecture"
- Conduction of product and hardware development quality audits
- Representative of Mannesmann Mobilfunk in A-interface interoperability testing activities
- Member of BSS product planning group which was defining operator requirements for future BSS releases
- Development of process improvements for type acceptance

III. LIST OF SUPPORTED PATENT LITIGATIONS AND VALIDITY ACTIONS

2024

Pantech Corporation v. Oppo Mobile Telecommunications Corp., Ltd.
Inter Partes Review matters
On behalf of Oppo
Counsel: Bayes PLLC
Role: Expert witness and consulting services

2024

Pantech Corp. et al. v. LG Electronics Inc. et al.
Civil Action No. 5:22-cv-00113-RWS-JBB (E.D.Tx.)
On behalf of LG Electronics
Counsel: Ropes & Gray LLP
Role: Expert witness and consulting services

2024

Ericsson v. Lenovo
Inter Partes Review matters
On behalf of Lenovo
Counsel: Kirkland & Ellis LLP
Role: Expert witness and consulting services

2024

Pantech Corp. et al. v. OnePlus Technology Co., Ltd.
Civil Action No. 5:22-cv-00069-RWS (E.D.Tx.)
On behalf of OnePlus
Counsel: Leydig, Voit & Mayer, Ltd.
Role: Expert witness and consulting services

2024

G+ Communications, LLC, v. Samsung Electronics Co., Ltd.
Civil Action No. 2:22-CV-78 (E.D.Tx.)
On behalf of Samsung
Counsel: Fish&Richardson P.C.
Role: Expert witness and consulting services

2023

Unified Patents, LLC v. Helios Streaming LLC
Inter Partes Review matters
On behalf of Unified Patents
Counsel: Akin
Role: Expert witness and consulting services

2023

Unified Patents, LLC v. SLS Manager Technologies
Inter Partes Review matters
On behalf of Unified Patents
Counsel: Unified Patents
Role: Expert witness and consulting services

2023

Headwater Research LLC v. Samsung Electronics Co., Ltd.
Inter Partes Review matters
On behalf of Samsung
Counsel: Fish&Richardson P.C.
Role: Expert witness and consulting services

2023

Pantech Corp. et al. v. LG Electronics Inc. et al.
Inter Partes Review matters
On behalf of LG Electronics
Counsel: Ropes & Gray LLP
Role: Expert witness and consulting services

2023

Apple Computer Trading (Shanghai) Co., Ltd, Apple Electronics Products Commerce (Beijing) Co., Ltd. v. Optis Cellular Technology LLC
Shenzhen, China, Intermediate People's Court
On behalf of Apple
Counsel: WilmerHale
Role: Expert witness and consulting services

2023

Huawei Technologies Co., Ltd. v. MediaTek Inc.
Inter Partes Review matters
On behalf of MediaTek
Counsel: Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P.
Role: Expert witness and consulting service

2023

Apex Beam Technologies LLC v. Samsung
Inter Partes Review matters
On behalf of Samsung
Counsel: Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P.
Role: Expert witness and consulting services

2022

Constellation Designs LLC v. LG Electronics, Inc.
Inter Partes Review matters
On behalf of LG Electronics
Counsel: Fish&Richardson P.C.
Role: Expert witness and consulting services

2022

Unified Patents, LLC v. Togail Technologies LTD.
Inter Partes Review matters
On behalf of Unified Patents
Counsel: Duane Morris LLP
Role: Expert witness and consulting services

2022

Ericsson v. Apple
Certain Mobile Telephones, Tablet Computers With Cellular Connectivity, And Smart Watches With Cellular Connectivity, Components Thereof, And Products Containing Same, Inv. No. 337-TA-1299 (U.S.I.T.C.)
On behalf of Apple
Counsel: WilmerHale
Role: Expert and consulting services

2022

Ericsson v. Apple
Civil Action No. 2:21-cv-376 (E.D.Tex.)
On behalf of Apple
Counsel: WilmerHale
Role: Expert and consulting services

2022

Intellectual Ventures II LLC v. Toyota Motor Cooperation.
Inter Partes Review matters
On behalf of Toyota

Counsel: Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P.
Role: Expert witness and consulting services

2022

Ericsson v. Apple
2nd Business Court, Rio de Janeiro, Brazil
On behalf of Apple
Counsel: WilmerHale
Role: Expert and consulting services

2022

Ericsson v. Apple
Civil Court, Bogotá, Columbia
On behalf of Apple
Counsel: WilmerHale
Role: Expert and consulting services

2022

Proven Networks LLC. v. NetApp Inc.
Inter Partes Review matters
On behalf of NetApp
Counsel: Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., Ropes & Gray LLP
Role: Expert witness and consulting services

2022

Ericsson v. Apple
Inter Partes Review matters
On behalf of Apple
Counsel: Fish&Richardson, Erise IP
Role: Expert witness and consulting services

2021

AEGIS 11 LLC v. Hisense Company, Ltd. and Hisense USA Corporation
Inter Partes Review matters
On behalf of Hisense
Counsel: Orrik Herrington & Sutcliffe LLP
Role: Expert witness and consulting services

2021

Nokia v. Lenovo
Certain Electronic Devices, Including Computers, Tablet Computers, and Components and Modules Thereof, Inv. No. 337-TA-1208 (U.S.I.T.C.)
On behalf of Lenovo
Counsel: WilmerHale
Role: Expert witness and consulting services

2021

Optis Cellular Technology LLC et al. v. Apple
Claim No. HP-2019-000006 (High Court of Justice, Business and Property Courts of England and Wales)
On behalf of Apple
Counsel: WilmerHale
Role: Expert witness and consulting services

2021

Ericsson v. Samsung
Inter Partes Review matters
On behalf of Samsung
Counsel: Kirkland&Ellis LLP, Fish&Richardson
Role: Expert witness and consulting services

2020

Panoptis Patent Management LLC et al. v. Apple Inc.
Civil Action No. 2:19-cv-66 (E.D. Tex.)
On behalf of Apple
Counsel: WilmerHale
Role: Expert witness at bench trial

2020

Sol IP, LLC v. AT&T Mobility, LLC et al.
Civil Action No. 2:18-cv-526 (E.D. Tex.)
On behalf of AT&T, Verizon, Sprint
Counsel: Gibson Dunn
Role: Expert witness and consulting services

2020

Bell Northern Research LLC v. LG Electronics Inc. et al.
Civil Action No. 18-CV-2864-CAB-BLM (S.D. Cal.)
On behalf of LG Electronics Inc.
Counsel: Fish&Richardson
Role: Expert witness and consulting services

2019

Conversant Wireless Licensing S.a.r.l. v. LG Electronics Deutschland GmbH
Civil Action No. 7 O 3277/18 (Landgericht Munich, Germany)
On behalf of LG Electronics Deutschland GmbH
Counsel: Wildanger Kehrwald Graf von Schwerin & Partner mbB
Role: Expert witness and consulting services

2019

Bell Northern Research, LLC v. Huawei Device Co., Ltd, et al.
Civil Action No. 3:18-cv-01784-CAB-BLM
On behalf of Huawei
Counsel: Fish&Richardson
Role: Expert witness and consulting services

2019

Uniloc USA, Inc., et al. v. Samsung Electronics America, Inc. and Samsung Electronics Co. Ltd.
Civil Action Nos. 2:18-cv-00040-JRG, 2:18-cv-00041-JRG, 2:18-cv-00042-JRG and 2:18-cv-00044-JRG (United States District Court for the Eastern District of Texas)
On behalf of Samsung
Counsel: Greenberg Traurig
Role: Expert witness and consulting services

2019

Uniloc USA, Inc., et al. v. Huawei Device USA, Inc. et al.
Civil Action No. 2:18-cv- 00072-JRG-RSP (E.D. Tex.)
On behalf of Huawei
Counsel: McGuireWoods
Role: Expert witness and consulting services

2019

Microsoft Corporation v. Uniloc 2017 LLC
Inter Partes Review of U.S. Pat. No. 7,167,487
Inter Partes Review of U.S. Pat. No. 7,075,917
On behalf of Microsoft and on behalf of Apple as joinder petitioner
Counsel: Klarquist Sparkman (Microsoft), Erise IP (Apple)
Role: Expert witness and consulting services

2019

Qualcomm v. KFTC
South Korean Case, Seoul High Court
On behalf of intervenor Apple supporting the KFTC

Counsel: Boies Schiller Flexner
Role: Expert witness

2018/19

Evolved Wireless, LLC v. Apple, Inc.
Civil Action No. 1:15-cv-00542-JFB-SRF
On behalf of Apple
Counsel: DLA Piper
Role: Expert witness and consulting services

2018/19

Cisco Systems Inc. v. Traxcell Technologies
Inter Partes Review of Traxcell Technologies patents
On behalf of Cisco
Counsel: King&Spalding
Role: Expert witness and consulting services

2018/19

Qualcomm Inc. v. Apple Inc.
Civil Action No. 3:17- cv-02398-DMS-MDD (United States District Court for the Southern District of California)
Civil Action No. 3:17-cv-02402-WQH-MDD
Certain Mobile Electronic Devices and Radio Frequency and Processing Components Thereof (II), Inv. No. 337-TA-1093
Inter Partes Review of U.S. PATENT NO. 9,154,356
Cases IPR2019-00047, IPR2019-00048, IPR2019-00049, IPR2019-00128, IPR2019-00129
On behalf of Apple and Intel
Counsel: WilmerHale
Role: Expert witness and consulting services

2018/19

Apple Inc. v. Qualcomm Inc.
Civil Action No. 3:17-CV-00108-GPC-MDD (United States District Court for the Southern District of California)
On behalf of Apple
Counsel: Fish&Richardson, Boies Schiller Flexner
Role: Expert witness and consulting services

2018

3G Licensing, S.A. et al. v. LG Electronics Inc. et al
Inter Partes Review of U.S. Patent No. 7,995,091
On behalf of LG Electronics
Counsel: Fish&Richardson
Role: Expert witness

2017

Huawei Technologies Co. LTD. v. T-Mobile US, Inc. & T-Mobile USA, Inc.
E.D. Tex. Case Nos. 2:16-cv-00052-JRG-RSP; 2:16-cv-00055-JRG-RSP; 2:16-cv-00056-JRG-RSP; and 2:16-cv-00057-JRG-RSP
On behalf of T-Mobile
Counsel: Gibson Dunn
Role: Expert witness and consulting services

2016

Koninklijke KPN N.V. v. Samsung Electronics America, Inc. et al.
Civil Action No. 14-cv-1165
On behalf of Samsung Electronics
Counsel: Baker Botts
Role: Expert witness and consulting services

2016

SSH v. Sony

OLG Düsseldorf, Germany
On behalf of SSH
Counsel: Cohausz&Florack
Role: Technical expert support

2015/16

LG Electronics v. Core Wireless Licensing S.A.R.L.
Inter Parles Review of U.S. Patent No. 8,165,049
On behalf of LG Electronics
Counsel: Greenberg Traurig
Role: Expert witness

2015/16

Core Wireless Licensing S.A.R.L. v. LG Electronics Inc. and LG Electronics MobileComm U.S.A., Inc
Civil Action No. 2:14-cv-911 (lead case) and Civil Action No. 2:14-cv-912 (consolidated)
On behalf of LG Electronics
Counsel: Greenberg Traurig, Sidley Austin
Role: Expert witness

2015

Intellectual Ventures I LLC v. T-Mobile USA, Inc. & T-Mobile US, Inc.
D. Del. Case No. 1:13-cv-01632
Intellectual Ventures II LLC v. T-Mobile USA, Inc. & T-Mobile US, Inc.
D. Del. Case No. 1:13-cv-01633
On behalf of T-Mobile
Counsel: Gibson Dunn
Role: Technical expert support

IV. EDUCATION

10/1984 – 10/1993 **University of Technology Aachen** **Aachen, Germany**
Graduate of Electrical Engineering with a focus on telecommunications technologies (Dipl.-Ing. TH)

10/1992 – 04/1993 **University of Technology Trondheim** **Trondheim, Norway**
Diploma Thesis "Design of a dual processor computer for digital signal processing in power electronics"

V. LANGUAGES

German, English, French

VI. PUBLICATIONS (selection)

- ”Unlocking the internet of things and driving the need for interoperability”, Global Telecoms Business, December 2013
- “The need for standardisation in the M2M services layer”, Global Telecoms Business, February 2014
- Co-authored white paper “Lightweight M2M: Enabling device management and applications for the internet of things”, Open Mobile Alliance, March 2014
- “Objects are a new way to create M2M applications”, Global Telecoms Business, April 2014
- “The need for standardisation in the M2M services layer”, M2M Now, July 2015

Appendix B

Appendix	Description
A	Curriculum Vitae of Friedhelm Rodermund
B	List of Appendices
C	Report of 3GPP TSG RAN WG1 #61bis meeting held in Dresden, Germany, 28th June – 2nd July, 2010
D	Document list of 3GPP TSG RAN WG1 #61bis meeting
E	3GPP_TSG_RAN_WG1 email from June 22, 2010, sharing R1-103696
F	Report of RAN WG1 meeting #61 held in Montreal, Canada, May 10 – 14, 2010
G	Document list of 3GPP TSG RAN WG1 #61 meeting
H	3GPP_TSG_RAN_WG1 email from May 5, 2010, sharing R1-102628
I	3GPP_TSG_RAN_WG1 email from June 30, 2010, sharing R1-104027
J	3GPP_TSG_RAN_WG1 email from June 22, 2010, sharing R1-103486
K	3GPP_TSG_RAN_WG1 email from June 22, 2010, sharing R1-103657

Appendix C

3GPP TSG RAN WG1 Meeting #62 R1-10xxxx
Madrid, Spain, 23 – 27 August, 2010

Agenda item	**3**
Title:	**Draft Report of 3GPP TSG RAN WG1 #61bis v0.1.0 (Dresden, Germany, 28th June – 2nd July, 2010)**
Document for:	**Comment**
Source:	**MCC Support**

Please provide your feedback by the latest on 18th August 2010



Fact Summary

Meeting:	**3GPP TSG RAN WG1 #61bis**
Dates:	**28th June through 2nd July, 2010**
Venue:	**Maritim Hotel Dresden – Germany**

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Main facts summary

3GPP TSG WG RAN1 #61 bis meeting, hosted by the European Friends of 3GPP took place at the Maritim Hotel Congress Center in Dresden, Germany.
The meeting started at 9:05 on Monday 28th June and finished at 17:14 on Friday 2nd July 2010.
The number of attending delegates was 234.

The week was scheduled as follows:

- Monday: Common session on Agenda items 1, 2, 3, 4, 6.1 (LTE CRs), 6.9 (UE cat) in the morning session. Common session on Agenda item 6.2.4 (PUCCH) and 6.2.3 (PDCCH) for the rest of the day.
- Tuesday: Main session on Agenda item 6.3.4 (Feedback), 6.2.4 (PUCCH), 6.2.3 (PDCCH), 6.2.7 (UCI on PUSCH) and 6.2.2 (PHICH) chaired by Matthew Baker. HSPA parallel session on Agenda items 5.1.1, 5.1.2 (CRs), 5.3 (LCRTDD MC-HSUPA), 5.4 (LCRTDD MU-MIMO) and 5.5 (SI on Improvements for distributed antennas for LCRTDD) chaired by Johan Bergman.
- Wednesday: Parallel sessions dedicated to Downlink RS (AIs 6.3.1 and 6.3.2) chaired by Tetsushi Abe on one hand, remaining HSPA issues on 4-carrier HSDPA (AI 5.2) chaired by Matthew Baker on the other hand.
- Wednesday following afternoon: Continued discussion on DL RS on one hand and session dedicated on AI 6.7 (Net.Pos) and 6.3.4 (Feedback) chaired by Matthew Baker. Drafting session on CRs related to 4C HSDPA chaired by Johan Bergman.
- Thursday morning: Parallel sessions on AI 6.8 (eICIC) chaired by Tetsushi Abe and on AI 6.3.3 (MU-MIMO) and remaining CA topics chaired by Matthew Baker.
- Thursday afternoon: Parallel sessions on remaining CA topics and Relay (AI 6.6) chaired by Matthew Baker and Agenda items 6.4.1 to 6.5.2 (UL RS and UL MIMO) chaired by Charlie Zhang.
- Friday morning: Early parallel sessions to complete 4C HSDPA on one hand and eICIC on the other hand, followed by common session on Agenda item 6.3.4 (Feedback) and CA continuation.
- Friday afternoon: Revisions

The list of action points that required RAN1 close follow-up is listed in Annex F (end of document).

The number of contribution documents for this meeting was 815.

Agenda Item	Input Document	Discussed Document
From AI 4 to 6.9	810	372

Note: The amount of documents includes those discussed during the email discussion session post meeting.

The following documents are missing. The corresponding contributions have not been handed over by companies.

1. Opening of the meeting

Mr. Matthew Baker (RAN1 Chairman) welcomed the participants to the 61st RAN WG1 bis meeting and opened the meeting at 09:05.
Mr Georg Wannemacher from Deutsche Telekom AG welcomed the delegates on behalf of the European Friends of 3GPP and detailed the domestic arrangements (meeting rooms, coffee breaks, restaurants and lunch suggestions) for the week. It was also noticed that a QUALITY MEETING SURVEY to fill-in after the meeting will be greatly appreciated by the organizer.
Furthermore, the group was also informed of a kind of social event that Vodafone would like to host together with Technical University of Dresden. TU- Dresden is active is many European projects and has requested an opportunity to demo their ongoing work on COMP to 3GPP community.
The demonstration is proposed to be done using live test bed with Vodafone and T-mobile providing the site, from the entrance of the congress center.
Meeting time is requested for presentation of a brief contribution on simulation results and demo setup details (R1-104122).

R1-104122	Cooperative Multipoint Performance Evaluation Based on Simulation and Trial Measurements in Easy-C Project	Vodafone	

1.1 Call for IPR

The Chairman drew attention to Members' obligations under the 3GPP Partner Organizations' IPR policies. Every Individual Member organization is obliged to declare to the Partner Organization or Organizations of which it is a member any IPR owned by the Individual Member or any other organization which is or is likely to become essential to the work of 3GPP.

The attention of the members of this Technical Specification Group is drawn to the fact **that 3GPP Individual Members have the obligation** under the IPR Policies of their respective Organizational Partners to **inform their respective** Organizational Partners **of Essential IPRs they become aware of**.
The members take note that they are hereby invited:
- to investigate in their company whether their company does own IPRs which are, or are likely to become Essential in respect of the work of the Technical Specification Group.
- to notify the Director-General, or the Chairman of their **respective** Organizational Partners, of all potential IPRs that their company may own, by means of the IPR Statement and the Licensing declaration forms (e.g. see the ETSI IPR forms http://webapp.etsi.org/Ipr/).

2 Approval of Agenda

R1-103430	Draft Agenda for RAN1#61bis meeting	RAN1 Chairman	

Matthew Baker (Chairman) proposed the agenda for the meeting and the plan (tentative schedule) of the week.
Decision: The agenda is approved.

3 Approval of Minutes from previous meeting

R1-104138	Final report of RAN1#61 meeting	MCC Support	(R1-103431)

The document was presented by Patrick Mérias (ETSI Mobile Competence Center) and provides the outcomes of last meeting. The revised document includes correct conclusion on the WF on HS-DPCCH for 4C-HSDPA that was agreed at last meeting. It was brought to the attention of delegates that discrepency exists between the number of registered/attending/signing participants. Signature of the participants list is mandatoty for all participants to a 3GPP meeting and will impact the calculation of voting rights for future election.
Discussion (Question / Comment): Late comment was raised that the sentence in brackets "(with DMRS or non-interleaving of CRS)"w.r.t Relaying UL grant agreement shall be removed on page 60.

Decision: The document is updated in R1-104183 and approved.

R1-104182	Selected highlights from RAN#48	RAN1 Chairman	(R1-103431)

The document was presented by Matthew Baker and provides an overview of the outcomes of last plenary meeting.
Discussion (Question / Comment): Ericsson commented the CoMP simulation assumptions bullet observing that it had two folds, meeting time issue and how companies set resources on the topic. Ericsson plans to run simulations and see what can be concluded already by September timeframe.
Decision: The document is approved.

Note: SI on Energy Saving for UMTS on hold until RAN#49.

4 Incoming Liaison Statements

R1-103525	Reply LS on UE transmitter structure and power in MC-HSUPA for 1.28Mcps TDD	RAN4, CATT	= R4-101779

The document was presented by Ms Yanping Xing from CATT and confirms that RAN1 working assumptions are consistent with the most likely implementation for multi-carrier HSUPA which utilize contiguous carriers. The reply also confirms that no new UE power classes is currently foreseen by RAN4 with the introduction of MC-HSUPA, since introducing higher maximum power will bring difficult problems for PA (higher unwanted emission and power consumption, EMC requirements difficulties).
Discussion (Question / Comment): To be taken into account under AI 5.3.
Decision: The document is noted.

R1-103528	Reply to LS on DB-DC-HSDPA secondary carrier activation	RAN4, ST-Ericsson	= R4-102337

The document was presented by Johan Bergman from ST-Ericsson and informs RAN1 that for the case of DB-DC-HSDPA, RAN4 concluded that it could be beneficial to allow for an interruption in the order of 200 µs, for the scenario mentioned in the question, in order to optimize the power consumption of the digital interface between RF and baseband. The interruption is expected to affect both reception as well as transmission.
In addition, RAN4 concluded that it may be beneficial to allow for an interruption of the transmission and reception of the carrier(s), in the band that is kept in active state, whenever the other band is deactivated. In analogy with the conclusion from question 1, the interruption time can be in the order of 200 µs.
Discussion (Question / Comment): To be taken into account.
Decision: The document is noted.

LTE related LSs

R1-103524	LS on DL timing difference and DL timing reference in Carrier Aggregation	RAN2, Qualcomm	= R2-103449

The document was presented by Wanshi Chen from Qualcomm and provides RAN2 understandings w.r.t the timing of uplink grants and downlink assignments and reference DL timing used by the UE.
Discussion (Question / Comment): RAN1 to take the information into account, and inform RAN2 if any concerns are seen. NSN commented that there may be some impact to layer 1 → misadjustment between DL CC's needs to be minimized to avoid reducing processing time.
Decision: The document is noted.

R1-103526	Reply LS on pathloss measurements in CA scenarios	RAN4, NTT DoCoMo	= R4-102260

The document was presented by Tetsushi Abe from NTT DoCoMo and confirms that path loss estimate should be done from DL CC which has the DL-UL linkage signalled by network on SIB2, regardless whether the CCis de-activated or not. No measurement configuration would be needed for the path loss measurement.
Discussion (Question / Comment): Chairman's understanding is that info from RAN4 still needed. Qualcomm commented that no RLF defined for SCC → Pathloss measurement may be unreliable. Philips commented that signalling issues shall be assessed.
Decision: The document is noted.

R1-103527	LS on in-device coexistence interference	RAN4, CMCC	= R4-102268

The document was presented by Xiaodong Xu from CMCC and shows RAN4 views on the coexistence issues between ISM technologies and LTE deployed in the adjacent bands. As a conclusion, the coexistence issue can cause interference to

the LTE receiver at the UE or make the LTE Tx cause interference to the ISM radio and methods for new signalling procedures or resource sharing/re-allocation may need to be considered.
Discussion (Question / Comment): Not really relevant to RAN1.
Decision: The document is noted.

LSs received during the week

Friday 2nd

R1-104168	LS on SCell activation/deactivation	RAN2, NTT DoCoMo	= R2-104181

The document was presented by Tetsushi Abe from NTT DoCoMo and informs of RAN2 decision to keep the SCell activation/deactivation mechanism for Carrier Aggregation in Rel-10, as majority of the companies showed interest in the possible UE battery consumption saving benefits. The LS is to RAN4 for answering questions related to glitches in PDCCH/PDSCH reception if the UE is allowed to retune the RF bandwidth of a RF component at SCell activation/deactivation transitions and during RRM measurements on a deactivated Scell.
Decision: The document is noted.

R1-104264	LS on CIF values	RAN2, Qualcomm	= R2-104209

The document was presented by Perter Gaal from Qualcomm. RAN2 asks RAN1:

- to indicate if the value of the CIF is unique for each cell configured for a particular UE.
- to indicate if the CIF is expected to change during the lifetime of an SCell.

Decision: The document is noted. RAN1 should think about it until next meeting.

R1-104265	Per UE PHR related questions	RAN2, MediaTek	= R2-104205

The document was presented by Matthew Baker on behalf of MediaTek. RAN2 asks RAN1's advice as to the need for additional power headroom information to be provided to the eNB, in addition to the per-CC PHR.
Decision: The document is noted. RAN1 should think about it until next meeting.

R1-104266	LS on status of RAN2 decisions on CA	RAN2, Alcatel-Lucent	= R2-104201

The document was presented by Mrs Jungah Lee from Alcatel-Lucent and informs RAN1 of the relevant CA decisions (not covered by other LSes) taken in RAN2#70bis.
Decision: The document is noted.

5 UTRA

R1-104141	Minutes from RAN1#61bis HSPA sessions	Ad Hoc chairman (Ericsson)	

The document was presented by Johan Bergman from Ericsson.
Decision: The document is endorsed and reported as follows in sections 5.1, 5.3, 5.4, 5.5 and 5.6.

5.1 Maintenance of UTRA Release 99 – Release 9

5.1.1 FDD

R1-103460	Support for different HS-SCCHs in contiguous TTIs in CELL_FACH	Ericsson. ST-Ericsson	

Decision: The document is noted.

Agreement:

- From RAN1 point of view, there is nothing preventing the Rel-8 feature 'Support for different HS-SCCHs in contiguous TTIs' from being valid also in CELL_FACH (i.e. not only in CELL_DCH).
- Provide a draft LS to RAN2 and RAN3 in R1-104145 (Ericsson).

Friday 2nd

R1-104145	Draft LS to RAN2 and RAN3 on Support for different HS-SCCHs in contiguous TTIs in CELL_FACH	Ericsson	

The document was presented by Johan Bergman from Ericsson. MCC shall check WI code. Motorola questioned whether the attachment was actually needed → just for background information.

Decision: The document and final LS is agreed in R1-104243. (WI code: RANimp-UplinkEnhState)

R1-103868	25.214 CR0605R3 (Rel-7. F) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH. CELL_PCH and URA_PCH states	Infineon Technologies. Qualcomm Incorporated	
R1-103869	25.214 CR0606R2 (Rel-8. A) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH. CELL_PCH and URA_PCH states	Infineon Technologies. Qualcomm Incorporated	
R1-103870	25.214 CR0607R2 (Rel-9. A) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH. CELL_PCH and URA_PCH states	Infineon Technologies. Qualcomm Incorporated	

Decision: The documents are noted and agreed in principle. Companies are encouraged to check the details until Friday. If needed, revisions can be provided in R1-104146 to R1-104148 (Infineon).

Friday 2nd

Qualcomm informed that consensus was reached and asked to minute that the following UE behavior is implied by the CRs in R1-103868/3869/3870: "In CELL_FACH and CELL_PCH state, when UE receives two H-RNTIs on two HS-SCCHs in the same TTI, the UE behavior is not defined."

Infineon informed that no more comments were received. R1-104146 to R1-104148 are not needed and original versions in R1-103868 to R1-103870 are agreed.

R1-103847	Impact of Unequal P/S-CPICH power setting on CQI reporting procedure when the UE is configured in MIMO mode	Qualcomm Incorporated	

Decision: The document is noted.

R1-104003	25.214 CR0602R2 (Rel-7, F) Clarification of the CQI definition when the UE is configured in MIMO mode	Huawei, Qualcomm Incorporated, InterDigital Communication LLC	
R1-104004	25.214 CR0603R2 (Rel-8, A) Clarification of the CQI definition when the UE is configured in MIMO mode	Huawei, Qualcomm Incorporated, InterDigital Communication LLC	
R1-104005	25.214 CR0604R2 (Rel-9, A) Clarification of the CQI definition when the UE is configured in MIMO mode	Huawei, Qualcomm Incorporated, InterDigital Communication LLC	

Decision: The documents are noted. It is agreed that the desired UE behaviour is to compensate for the S-CPICH power offset in the MIMO CQI calculation. Continue discussion offline until Friday. If needed, revisions can be provided in R1-104149 to R1-104151 (Huawei).

Friday 2nd

Huawei briefly presented the revisions in R1-104149 to R1-104151.

Motorola provided following text on the reflector "In addition, while estimating the CQI, the UE should take into account the relative transmit power of the S-CPICH compared to the primary CPICH transmit power as specified in section 5.2.16." Text was not agreed by Qualcomm. NSN do not strongly see the necessity of such CRs.

The need for a clarification is agreed in principle. The details of the CRs shall be agreed by RAN1#62.

R1-104006	Activation state of the secondary uplink frequency	Huawei	

Decision: The document is noted.

R1-104038	25.212 CR0287 (Rel-9, F) Clarification of uplink frequencies	ZTE	

Decision: The document is noted. Provide revision 1 in R1-104152 (ZTE).

Friday 2nd : R1-104152 is agreed

R1-104039	25.213 CR0107 (Rel-9, F) Clarification of uplink frequencies	ZTE	

Decision: The document is noted. Provide revision R1 in R1-104153 (ZTE).

Friday 2nd : R1-104153 is agreed

R1-104037	RF impact of multi-carrier HSDPA	ZTE	

Decision: The document is noted. Companies are encouraged to check further and if needed contribute to the appropriate WG(s) at the next meeting(s).

R1-104180	Clarification of E-AGCH/E-RGCH monitoring in a CM gap when DL_DRX_Active is TRUE	Qualcomm Incorporated	

Decision: The document is noted. Provide a Rel-7 CR and shadow CRs for Rel-8 and Rel-9 in R1-104154 to R1-104156 (Qualcomm).

Friday 2nd :

R1-104154	25.214 CR0612 (Rel-7, F) Clarification of E-AGCH/E-RGCH monitoring in a CM gap when DL_DRX_Active is TRUE	Qualcomm Incorporated	
R1-104155	25.214 CR0613 (Rel-8, A) Clarification of E-AGCH/E-RGCH monitoring in a CM gap when DL_DRX_Active is TRUE	Qualcomm Incorporated	
R1-104156	25.214 CR0614 (Rel-9, A) Clarification of E-AGCH/E-RGCH monitoring in a CM gap when DL_DRX_Active is TRUE	Qualcomm Incorporated	

Decision: The documents are noted and CRs are agreed according MCC shall check for the correct spec version, CR category and CR release version into the cover sheets.

5.1.2 TDD

R1-103993	25224 CR0253 (Rel-8, F) Clarification on HS-DSCH transmission in CELL_PCH or URA_PCH state for 1.28Mcps TDD	TD Tech	

Decision: The document is noted.

R1-103994	25224 CR0254 (Rel-9, A) Clarification on HS-DSCH transmission in CELL_PCH or URA_PCH state for 1.28Mcps TDD	TD Tech	

Decision: The document is noted.
Updated simulation assumptions can be provided in R1-104143 (TD Tech).

Friday 2nd

R1-104143	Simulation assumptions HS-DSCH transmission in CELL_PCH or URA_PCH state for 1.28Mcps TDD	TD Tech	

The document was presented by Ms Rong Li from TD Tech.
Discussion (Question / Comment): CATT believes payload size is not sufficient and the value 176 should be added.
Decision: The document is noted and shall be revised with the add-on "select one or both of {176, 240}. Final version in R1-104257 is agreed for HS-DSCH performance investigation in Enhanced CELL_PCH or URA_PCH states.

5.2 4-carriers HSDPA

WID in RP-091438

5.2.1 Remaining details

3C without MIMO

R1-103461	Proposed way forward on HS-DPCCH design for 3C-HSDPA w/o MIMO	Ericsson, ST-Ericsson, Nokia Siemens Networks, Nokia, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Johan Hultell from Ericsson and proposes the following as a basis for further detailed design:

- Proposal 1: Adopt SF128 for HS-DPCCH also for the cases when 3 carriers without MIMO are configured.
- Proposal 2: A DTX codeword is included in the ACK/NACK codebook also for the case when 3 carriers are configured without MIMO.
- Proposal 3: Changing transmission power in the middle of an uplink slot due to half slot ACK/NACK transmission should be avoided also for the case where 3 carriers without MIMO are configured.
- Proposal 4: When 3 carriers are configured the information of the fourth CQI field is always DTXed.

Discussion (Question / Comment): Number of contributions seems to show other proposals, said Mr Chairman. Huawei has different view on DTX codeword and believes better performance can be achieved.
Decision: The document is noted.

R1-104213	HS-DPCCH Configuration for 3C without MIMO	Qualcomm Incorporated	(R1-103851)

The document was presented by Arjun Bharadwaj from Qualcomm and proposes:

- When the UE is configured with 4 carriers or 3 carriers with MIMO on at least one carrier,
  - Spreading factor 128 is used for the HS-DPCCH channel regardless of the number of activated carriers.
  - Rel-9 DC-MIMO codebook is used regardless of whether MIMO is configured or not.+

- Adopt a single code book Rel-10 TC-HSDPA solution for the case when the UE is configured with 3 carriers without MIMO that is transmitted using 1xSF256.

Discussion (Question / Comment): Issues on robustnees raised by Huawei. Ericsson agreed with proposal 1 in first bullet.
Decision: The document is noted.

R1-103463	ACK/NACK for 3C-HSDPA without MIMO	Ericsson. ST-Ericsson	

The document was presented by Johan Hultell from Ericsson and proposes to:

- Adopt a 1xSF128 HS-DPCCH solution also for the case of 3C-HSDPA and where none of the carriers are configured with MIMO.
- Reuse the Rel-9 HARQ-ACK codebook also for the case of 3C-HSDPA and where none of the carriers are configured with MIMO.
- Discuss whether a new DTX codeword for the 3C-HSDPA without MIMO as a possible optimization.
- Agree that the HARQ-ACK information of the fourth carrier always is DTXed (i.e. the codeword A/D would be used when sending an ACK for carrier 3) when a UE is configured with 3 carriers without MIMO.

Discussion (Question / Comment): Evaluating detection performance was debated, when Node-B fails to decode the codeword correctly.
Decision: The document is noted.

R1-103947	Considerations regarding HS-DPCCH design for 3C without MIMO	InterDigital Communications, LLC	

The document was presented by Joseph Levy from InterDigital and proposes the following:

- Use 1xSF256 frame structure with a Release 8 backward compatible codebook for the special case of 3C w/o MIMO.
- Adopt a Release 8 backward compatible ACK/NACK codebook of similar decoding performance to the proposed.

Discussion (Question / Comment): Is the use of new codebook with 1xSF128 an option InterDigital may considered? asked Ericsson. SF128 new codebook shows almost same performance curves (InterDigital)
Decision: The document is noted.

R1-104007	HS-DPCCH design for 3C-HSDPA without MIMO	Huawei	

The document was presented by Zongjie Wang from Huawei and proposes to adopt SF256 for HS-DPCCH of 3C-HSDPA without MIMO configured. The paper concludes that SF256 scheme is more attractive than SF128 scheme for 3C-HSDPA without MIMO, as not only does SF256 provide gains of mis-detection but also considerable gains of RLC retransmission in all sub-cases of 3C-HSDPA and also outperforms SF128 under the consideration of robustness.
Decision: The document is noted.

R1-104008	HARQ-ACK codebook design for 3C-HSDPA without MIMO	Huawei	

The document was presented by Yang Bo from Huawei and introduces 3 joint coding schemes of codebook design for 3C-HSDPA without MIMO operation and analyses the code distance and performance of codebooks for further discussion in RAN1.
Decision: The document is noted.

R1-104200	HS-DPCCH design for 3C-HSDPA without MIMO configuration	ZTE	(R1-104040)

The document was presented by Jun qiang Liu from ZTE and proposes to:

- Adopt 1xSF256 HS-DPCCH scheme for the case of 3-carrier without MIMO configuration.
- Joint coding of HARQ-ACK messages of 3 carriers for the case of 3-carrier without MIMO configuration.
- Adopt the codebook proposed in this contribution for joint coding of HARQ-ACK messages and consider using the Rel-8 compatible codebook for robustness.

Decision: The document is noted.

R1-104108	Discussion on the remaining details of 4-carrier HSDPA	Nokia, Nokia Siemens Networks	

The document was presented by Arto Lehti from Nokia and concludes as follows:

- Use the same HS-DPCCH design for 4C-HSDPA configuration when one carrier is deactivated, and for 3C-HSDPA when all three carriers are active, for both MIMO and non-MIMO cases
- Adopt the proposals from the RAN1#61 meeting minutes highlighted with yellow colour in this contribution
- The Rel-5 – Rel-9 signalling values for Δ_{ACK}, Δ_{NACK} and Δ_{CQI} are used as basis for the dynamic 4C-HSDPA HARQ-ACK and CQI power settings

- For HARQ-ACK, the first half-slot should be encoded with two carriers' HARQ-ACK as in 4 carrier case, and the second half-slot should use the same approach and always use a DTX code word for the 4th (not configured) carrier
- The CQI field that is not needed should be in DTX
- Possible explicit limitation to the number of parallel HS-SCCH orders should be discussed

Discussion (Question / Comment): W.r.t proposal 2, Mr Chairman commented that it was already agreed and correctly minuted in the revised R1-104183.
Decision: The document is noted.

From the different contributions, companies in favor of:
- SF128: Ericsson, ST-Ericsson, Nokia, NSN, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
- SF256: Qualcomm, InterDigital, Huawei, ZTE

As the group already agreed details of HS-DPCCH channelisation code (SF128) for 4C and also agreed to improve the 3C case, Mr Chairman asked whether companies supporting SF128 will agree to proceed with SF256.
Ericsson commented that there was no proof of actual system performance gain.
NSN view is that there are very little difference in performance between the two but testing efforts should be taken into account and may imply longer time to market.

Way forward: Adopt Alt 2, provided that the codebook is agreed by 8am Friday morning. If the codebook is not agreed, then Alt 1a is adopted. Codebook design will not be on the agenda for subsequent meetings.
- Alt 1a:
  - SF128 with reused Rel-9 codebooks:
  - Ericsson, ST-Ericsson, Nokia, NSN, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
- Alt 2:
  - SF256 with new codebook:
  - Qualcomm, InterDigital, Huawei, ZTE

Friday 2nd
No objection from NSN with the WF but further codebook optimization might be needed.
Therefore it is agreed to :
- use codebook from Table 5 in R1-104008 (based on analysis in R1-104237).
  - subject to checking of cases that have not been analysed.
- SF=256 for 3C configured, w/o MIMO.

R1-104237	Performance evaluation of proposed codebooks for 3C-HSDPA without MIMO configuration	ZTE	

Other codebook aspects

R1-104009	Discussion on DTX codeword for HARQ-ACK of 4C-HSDPA	Huawei	

The document was presented by Yang Bo from Huawei and proposes to adopt 'PRE' as the DTX codeword and append it to the Rel-9 codebook for 4C-HSDPA.
Decision: The document is noted.

Conclusion: Keep POST codeword unless a different codeword (new or PRE) is agreed by Friday.
Friday 2nd : It is agreed to use new DTX codeword from R1-103462.

R1-103948	PCI/CQI coding and mapping for 4C-HSDPA	InterDigital Communications, LLC	

The document was presented by Joseph Levy from InterDigital and discusses various considerations on the CQI encoder design for 3/4-carrier HSDPA. The proposed solution for CQI coding for pairs of non-MIMO cells (CQIs for pairs of non-MIMO cells are jointly coded and repeated.) shows small technical advantage according to this paper.
Discussion (Question / Comment): Ericsson, Qualcomm, NSN not actually in favor of.
Decision: The document is noted.

Conclusion: Adopt independently-coded CQI/PCI.

R1-103950	Open issues for UL Feedback design for 4C-HSDPA	InterDigital Communications, LLC	

The document was presented by Joseph Levy from InterDigital and proposes the following:

- The HARQ-ACK codebook is selected based on the carrier activation status depending on the MIMO configuration per carrier group.
- No remapping for the case when 3 carriers remain activated.

Discussion (Question / Comment): Ericsson not in favor of proposal 1 but fine with proposal 2 and commented that Rel-9 codebook is always used regardless of the MIMO configuration.
Decision: The document is noted and proposal 2 is agreed: No remapping for the case when 3 carriers remain activated. It is also agreed that the Rel-9 codebooks are always used for the 4C cases regardless of the MIMO configuration.

Power offsets and HS-SCCH order reliability

R1-103462	HS-DPCCH power offsets for 4C-HSDPA	Ericsson. ST-Ericsson	

The document was presented by Johan Hultell from Ericsson and proposes the following:

- When 3 or 4 carriers are activated
  - If the POST codeword is reused as DTX codeword
    - A HARQ-ACK power offset of 4 dB is used if at most one of the activated carriers in each of the two pair of carriers that are encoded jointly is configured with MIMO.
    - Otherwise a power offset of 6 dB is required.
  - If a new DTX codeword is introduced
    - A HARQ-ACK power offset of 4 dB is sufficient for all scenarios.
    - In scenarios where all carriers are configured in SISO mode a 2 dB power offset may be sufficient.
- When 2 carriers are activated
  - A HARQ-ACK power offset of 2 dB is used for all cases
  - No power offset is used for the other cases
- When 1 carrier is activated
  - A HARQ-ACK power offset of 2 dB is used if the carrier is configured in MIMO mode.
  - No power offset is used for the other cases.

Decision: The document is noted.

R1-103853	HS-DPCCH Power Offsets for 4C-HSDPA	Qualcomm Incorporated	

The document was presented by Arjun Bharadwaj from Qualcomm and proposes the required HS-DPCCH power offsets for the different configurations in 4C-HSDPA.
Discussion (Question / Comment): Evaluation methodology was debated in order to provide good performance comparison.
Decision: The document is noted.

Conclusion:
Agree power offset evaluation methodology by email by Fri 9th July and decide power offsets at RAN1#62.

R1-104181	Discussion on HS-SCCH order reliability	Huawei	(R1-104010)

The document was presented by Yang Bo from Huawei and raises the issue that, for the case of MC-HSDPA, the probability of mis-detection and false alarm becomes relatively higher compared to Rel-5 due to codeword decoding error. Some solutions are considered to lower the error probability of HARQ-ACK feedback for HS-SCCH order.
Discussion (Question / Comment): Alcatel Lucent noticed new codebook be used in this paper → Huawei: actually no new codebook. Motorola do not see the reason of having different power level for HS-DPCCH ?
Decision: The document is noted.

R1-103852	Ensuring robustness of activation/de-activation of secondary carriers in 4C-HSDPA	Qualcomm Incorporated	

The document was presented by Arjun Bharadwaj from Qualcomm and proposes:

- The HS-DPCCH power offset is boosted by an additional amount that is configured by the network, whenever an acknowledgement is sent in response to a carrier (de)activation HS-SCCH order.
- Upon (de)activation of carriers, the UE applies a boost to the HS-DPCCH power offsets (ΔACK, ΔNACK, ΔCQI) for a configurable period of time.

Decision: The document is noted.

R1-104068	HS-SCCH Order and HS-DPCCH Robustness in 4C-HSDPA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Shin horng Wong from Alcatel Lucent and deals with two error scenarios (Error 1 & Error 2) that cause the HS-DPCCH format to be out of sync between the NB and the UE. A proposed solution in [R1-3129 - Qualcomm] to increase the HS-DPCCH power after HS-SCCH change is discussed and it is concluded that the proposed solution may cause excessive interference and it is unable to handle Error 2.
Discussion (Question / Comment): No clear view how these error cases should be handled, said Mr Chairman.
Decision: The document is noted.

Motorola would like to see the text related to received powers unmodified in the MIMO CRs.

Conclusion: No consensus of a need to do anything for this case.

Friday 2nd

R1-104159	Minutes from RAN1#61bis 4C-HSDPA drafting session	HSPA session chairman	

The document was presented by Johan Bergman from Ericsson and provides the outcomes of the CRs drafting session, including the remaining details as reported hereafter.
Decision: The document is endorsed.

Power saving, DRX and autonomous deactivation

R1-103464	UE DRX for 4C-HSDPA	Ericsson. ST-Ericsson	

Decision: The document is noted.

R1-104067	UE Autonomous Secondary Carrier Deactivation in 4C-HSDPA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Decision: The document is noted.

R1-104179	Power saving solutions for 4C-HSDPA	Nokia, Nokia Siemens Networks, Huawei, Qualcomm, ZTE, InterDigital	(R1-104109)

Decision: The document is noted.

R1-104070	Fast Activation/Deactivation of Secondary Carriers for Energy Saving & Load Balancing in 4C-HSDPA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Decision: The document is noted.

Serving cell change

R1-104069	Enhanced Serving cell Change in 4C-HSDPA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Decision: The document is noted.

R1-104071	Further Discussion on Fast Primary Carrier Change in 4C-HSDPA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Decision: The document is noted.

Miscellaneous

R1-104072	On 4C-HSDPA Cell Coverage	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Decision: The document is noted

Not treated.

R1-104114	Timer based implicit deactivation for 4C-HSDPA	Huawei	

5.2.2 Draft CRs

Draft CRs shall be updated with the latest decisions in R1-104170 to R1-104174. - to be endorsed on Friday morning.
Prepare a draft LS to RAN2, RAN4 cc RAN3 with draft CRs attached to it (in R1-104175)

Friday 2nd

R1-104170	25.211 CR0284R1 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm Incorporated, Nokia Siemens Networks, Nokia, Ericsson, ST-Ericsson, Huawei, Interdigital, Samsung, ZTE, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	(R1-103854)

Decision: The document is noted and CR is technically endorsed.

R1-104171	25.212 CR0288R1 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm Incorporated, Nokia Siemens Networks, Nokia, Ericsson, ST-Ericsson, Huawei, Interdigital, Samsung, ZTE, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	(R1-103855)

Decision: The document is noted and CR is technically endorsed.

R1-104172	25.213 CR0108R1 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm Incorporated, Nokia Siemens Networks, Nokia, Ericsson, ST-Ericsson, Huawei, Interdigital, Samsung, ZTE, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	(R1-103856)

Decision: The document is noted and CR is technically endorsed. MCC shall correct cover sheet by removing brackets in the sourcing companies list.

R1-104173	25.214 CR0611R1 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm Incorporated, Nokia Siemens Networks, Nokia, Ericsson, ST-Ericsson, Huawei, Interdigital, Samsung, ZTE, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	(R1-103857)

Decision: The document is noted. It shall be revised in R1-104174 with "the secondary serving cell" changed to "any secondary serving cell" in section 6A.1.1. Revision in R1-104174 is endorsed.

R1-103858	25.215 CR0198 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm Incorporated	

Decision: The document is withdrawn. CR is withdrawn as there are no changes needed to 25.215.

R1-104175	[DRAFT] LS on Draft RAN1 CRs for 4C-HSDPA	Qualcomm	

The document was presented by Sharad Sambhwani from Qualcomm and reports the progress achieved by RAN1 on the 4C-HSDPA work item, including a set of technically endorsed draft CRs to the RAN1 specifications.
Discussion (Question / Comment): NSN kindly commented that there was no reason to use different font color. Motorola noticed that reference to the list of CRs attached to the LS shall be updated to reflect the revision in R1-104174.
Decision: The document is noted and final LS is agreed in R1-104242.

5.3 LCR TDD MC-HSUPA

WID in RP-090990

R1-103877	Consideration on UPH of 1.28M TDD MC-HSUPA	ZTE

Decision: The document is noted.

R1-103984	Discussion on UPH in MC-HSUPA for 1.28Mcps TDD	CATT

Decision: The document is noted.

R1-103997	Discussion on UPH for 1.28Mcps TDD MC-HSUPA	TD Tech

Decision: The document is noted.

Working assumptions, to be checked until next meeting:

- In MC-HSUPA, UPH of one E-PUCH carrier can be derived from the UPH of other E-PUCH carriers.
- In MC-HSUPA, only the UPH for the carrier where the SI is reported is reported in the SI.

R1-103983	Discussion on DRX in MC-HSUPA for 1.28Mcps TDD	CATT

Decision: The document is noted.

R1-103996	Discussion on DRX procedures for 1.28Mcps TDD MC-HSUPA	TD Tech

Decision: The document is noted.

Agreements:

- For HS-SCCH or E-AGCH monitoring, the activation and deactivation status of DRX is always identical for all the carriers. The DRX (de)activation order carried by HS-SCCH is effective for all carriers.
- Parameter UE_DRX_Enabled should be maintained per UE.
- Parameter E_AGCH_DRX_Active also should be maintained per UE.
- Parameters of DRX pattern should be shared by all carriers of MC-HSUPA.

Companies are encouraged to study the properties (battery saving vs complexity) of common and carrier-specific DRX state machines respectively until the next meeting.

R1-103995	Discussion on E-HICH allocation for 1.28Mcps TDD MC-HSUPA	TD Tech

Decision: The document is noted.

Agreement:

- The E-PUCH and the associated E-HICH are allocated on the same carrier.

Provide draft LS to RAN2, RAN3 and RAN4 on the RAN1 agreements made so far in R1-104144 (CATT).

R1-104144	Draft LS to RAN2, RAN3 and RAN4 on LCR TDD MC-HSUPA	CATT

The document was presented by Ms Yanping Xing from CATT.
Decision: The document is noted and final LS is agreed in R1-104258.

5.4 MU-MIMO for LCR TDD

WID in RP-100347

R1-103875	Discussion on special default midamble allocation scheme for LCR TDD MU-MIMO	ZTE	

Decision: The document is noted.

R1-103986	Discussion on association between midambles and channelisation codes for MU-MIMO	CATT	

Decision: The document is noted.

R1-103999	Discussion on midamble allcation for 1.28Mcps TDD MU-MIMO	TD Tech	

Decision: The document is noted.

R1-103876	Discussion of logical resource tag ID allocation scheme for MU-MIMO of 1.28Mcps TDD	ZTE,Potevio	

Decision: The document is noted.

R1-103985	Discussion on optimization of E-HICH signature sequence allocation in MU-MIMO	CATT	

Decision: The document is noted.

R1-103998	E-HICH signature sequence allocation for 1.28Mcps TDD MU MIMO	TD Tech	

Decision: The document is noted.

It is FFS till the next meeting which schemes to pick and whether the standalone midamble allocation is made by the Node B or the RNC. CATT will initiate an email discussion till the next meeting.

R1-104197	Control channel design in MU-MIMO for LCR TDD	CATT, ZTE	(R1-103987)

Decision: The document is noted.

R1-104000	Control Channel design for 1.28Mcps TDD MU-MIMO	TD Tech	

Decision: The document is noted.

Conclusion: The control channel design in R1-104197 is agreed.

5.5 SI on Improvements for Distributed Antennas for LCR TDD

SID RP-100178

R1-103879	Summary from email discussion on Improvements of distributed antenna for 1 28Mcps TDD	ZTE	

The document was presented by River Huang from ZTE.
Decision: The document is noted.

R1-104142	Discussion on measurement in distributed antenna scenario for 1.28Mcps TDD	ZTE	(R1-103878)

Decision: The document is noted.

Companies are encouraged to investigate till the next meeting to what extent the CELL PORTION concept can be re-used and what additional enhancements may be needed. ZTE will initiate an email discussion until the next meeting.

5.6 Other

R1-104157	On deploying DC-HSDPA UEs in Single Carrier Networks	Qualcomm Incorporated	(R1-103859)

Decision: The document is noted.

6 E-UTRA

6.1 Maintenance of E-UTRA Releases 8 – 9

R1-103744	Discussion on MBMS UE capability	Panasonic	

The document was presented by Hidetoshi Suzuki from Panasonic and is an attempt to conclude MBMS capability for release 9. It is proposed that minimum MBMS capability is specified in TS36.306 as shown in table 1.
Discussion (Question / Comment): Topic needs further discussion in RAN1, said Mr Chairman.
Ericsson basically agreed with the proposal but the way it is captured should be revised (wrong section)
Philips raised CA specific issues and that UE categories for Rel-10 shall be also considered.
Decision: The document is noted. Draft CR in R1-104185 and draft LS in R1-104186.
Friday 2nd

R1-104185	36.306 Draft CR (Rel-9, F) Clarification of MBMS UE capability	Panasonic, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Ericsson, ST-Ericsson, Huawei, KDDI, Samsung, Orange, Nokia, Nokia Siemens Network	

Discussion (Question / Comment): It is noted that no specific UE capability is defined. Typo on cover page and section number for correction.
Decision: The document is noted, corrected and final version is endorsed in R1-104260.

R1-104186	Draft LS on MBMS UE capability	Panasonic, …	

Discussion (Question / Comment): CR Tdoc must be updated + sentence referring to discussion document shall be removed; CRs → CR
Decision: The document is noted and final LS is agreed in R1-104261.

R1-104124	36.212 Draft CR on Soft Buffer Size Determination for PMCH	Qualcomm Incorporated	

The document was presented by Wanshi Chen from Qualcomm and clarifies that soft buffer size limitation is only applicable to PDSCH.
Discussion (Question / Comment): No comment.
Decision: The document is noted. CR shall be revised in R1-104187 as CR0099 to update cover sheet and modify text to explicitly list transport channels.
Friday 2nd

R1-104187	36.212 CR0099 (Rel-9, F) Clarify soft buffer size determination for MCH	Qualcomm Inc., Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Panasonic, NEC, Ericsson, ST-Ericsson, Nokia, Nokia Siemens Networks	(R1-104124)

Decision: The document is noted and CR is agreed.

R1-103745	Draft LS on the description of multi-user MIMO in feature group indicator	Panasonic, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT, Ericsson, Huawei, LGE, Nokia, Nokia Siemens Networks, Potevio, Samsung, ST-Ericsson, ZTE	

The document was presented by Hidetoshi Suzuki from Panasonic.
Decision: The document is noted and final LS is approved in R1-104188.

R1-103991	36.213 DraftCR (Rel-8, F) Small correction to PUSCH power control parameter	Potevio	

The document was presented by Liangang Chi from Potevio and Correct the parameter PREAMBLE_INITIAL_RECEIVED_TARGET_POWER to the *preambleInitialReceivedTargetPower*.
Discussion (Question / Comment): Definitely not a Rel-8 CR, according to Mr Chairman.
Decision: The document is noted and draft_CR is not agreed. The CR shall be readdressed once Rel-10 specifications are available.

R1-103992	36.213 DraftCR (Rel-9, A) Small correction to PUSCH power control parameter	Potevio	

See decision on R1-103991 above.

R1-104001	Draft Rel-8 CR on correction on CRS transmission	CATT	

The document was presented by Zhukang Shen from CATT and specifies that CRS shall be transmitted in all DwPTS of frame structure type 2.
Discussion (Question / Comment): Whether cell-specific reference signals shall be transmitted in all downlink subframes and DwPTS is the question. The only case where CR will be needed is when downlink subframes do not include DwPTS, said Mr Chairman.
Nokia supports Mr Chairman'view.
Decision: The document is noted and draft_CR is not agreed. Following off line discussion, it is clear that the statement that Cell-specific reference signals shall be transmitted in all downlink subframes in a cell supporting non-MBSFN transmission includes DwPTS in FS2.

R1-104002	Draft Rel-9 CR on correction on CRS transmission	CATT	

See decision on R1-104001 above.

R1-104135	Confirmation of UE behaviour in case of simultaneously-triggered SR, SRS and CQI	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	(R1-104073)

The document was presented by Yu Yong from Alcatel-Lucent Shanghai Bell and provides the following clarifications:

- UE behaviour (send shortened SR together with SRS, drop CQI) is the right interpretation according to the specifications under this situation;
- UE behaviour (send shortened SR only, drop both SRS and CQI) shall be avoided in the implementation;

Decision: The document is noted. This is the understanding of RAN1.

Before closing the AI, Mr Chairman clarified a few issues for Rel-10 CRs.
In relation with the 3 Rel-10 WIs, rapporteurs are asked to provide draft CRs as soon as possible, such that these draft CRs can be already reviewed by next meeting.

6.2 Carrier Aggregation

6.2.1 PCFICH

R1-103530	Remaining details of PCFICH with cross-carrier scheduling	Qualcomm Incorporated	

The document was presented by Wanshi Chen from Qualcomm and proposes the following:

- Additional solutions to indicate the start position of a cross-carrier scheduled PDSCH to a UE are not needed
- In case of the cross-scheduled PDSCH, RRC signaling provides two values, one indicating the number of OFDM symbols used for PDCCH in non-MBSFN subframes, and the other indicating the number of OFDM symbols used for PDCCH in MBSFN subframes.

Discussion (Question / Comment): NEC questioned how the scheme will work in case of pico/femto cells subframes.
Decision: The document is noted.

R1-103825	Remaining issues of PCFICH	NEC Group	

The document was presented by Boon Ng from NEC and proposes to adopt for cross-carrier CFI signalling: Two CFI values, with each value corresponding to a different set of subframes, are signalled by RRC. The details of RRC signalling design can be decided in RAN2.
Discussion (Question / Comment): NEC confirmed that focus was actually on Het-Net deployment scenario.
Decision: The document is noted.

R1-103607	PCFICH for cross-carrier scheduling	HTC	

The document was presented by … from HTC and suggests that PCFICH signalling for cross-carrier scheduling should be a dynamic approach, e.g a DCI signalling, or at least a dynamic-like approach, switching between static and dynamic for varied scenarios.
Decision: The document is noted.

R1-103714	Cross-carrier PCFICH signaling	Sharp	

The document was presented by … from Sharp and proposes the following:

- A dynamic cross-carrier PCFICH signaling method is necessary in addition to the RRC signaling method.
- CIF/CFI joint coding with CRC masking method is supported in addition to the RRC signaling method.

Decision: The document is noted.

R1-103954	Remaining Issues for PDSCH Starting Point Indication with Cross-carrier Scheduling	LG Electronics	

The document was presented by … from LGE and suggests drafting an LS regarding the RRC signaling for PDSCH starting points considering the following points for MBSFN subframes:

- It should be clarified whether additional control signaling of PDSCH starting point for MBSFN subframes is necessary or not.
- If it is necessary, it should be clarified whether it is cell-specific or UE-specific.

Discussion (Question / Comment): Mr Chairman confirmed that RRC signalling was not to be discussed in RAN1.
Decision: The document is noted.

R1-104074	PCFICH	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Mrs Jungah Lee from Alcatel-Lucent and proposes to agree the baseline from RAN1#61 pertaining to the PDSCH starting position indication, ie

- In case of cross-carrier scheduling, UE always follow the value signalled by RRC for ascertaining the PDSCH starting position on the CC carrying the PDSCH.

- One value of PDSCH starting position per CC for normal subframes is signalled by RRC

Decision: The document is noted.

Conclusions: No consensus on additional solutions.

Signalling of second PDSCH starting position by RRC for a certain set of subframes
- Yes: Qualcomm, NEC, (Philips)
- No: Ericsson, ST-Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Huawei, LGE, Nokia, NSN

LS to RAN2 in R1-104232 (NSN) stating the following:
- RAN1 has determined that for UEs that may be cross-carrier scheduled using CIF, a single value of the PDSCH starting position on the CC carrying the PDSCH should be indicated to the UE by RRC.
- RAN1 was not able to agree on whether signalling of a second PDSCH starting position for a certain set of subframes could also be useful.

Friday 2nd

R1-104232	DRAFT LS on Signaling of PDSCH Starting Position for Cross-CC Scheduling	Nokia Siemens Networks, Nokia	

The document was presented by Mieszko Chmiel from NSN.
Discussion (Question / Comment): NEC possible single values to be added + one paragraph deleted
Decision: The document is noted and shall be revised in R1-104262. Following hard debate on the single value per CC to be indicated to the UE by RRC, LS is finally agreed in R1-104267.

R1-104011	On RRC signaling of PDSCH starting position	NTT DOCOMO	

The document was presented by Kazuaki Takeda from NTT DoCoMo and proposes to extend the support of RRC signaling of the PDSCH starting position for any component carrier including the case when the number of component carriers is one.
Discussion (Question / Comment): Clarification was given that "number of component carrier is one" only concerns Primary CC. It would also apply in case of non cross carriers selection.
Decision: The document is noted.

6.2.2 PHICH

R1-103531	PHICH for CA operation	Qualcomm Incorporated	

The document was presented by Wanshi Chen from Qualcomm and proposes the following for PHICH design, in line with the previous decision that PHICH is transmitted on the carrier where the UL grant was transmitted:
- Rel-8 mapping rules with UL resource indexing across applicable UL CCs
  - The UL resource indexing for the purpose of PHICH resource determination on a DL CC starts from the UL CC paired with that DL CC as defined in Rel-8 system information
  - The UL resource indexing for the purpose of PHICH resource determination on a DL CC is unique for each CC
    - E.g. cyclic indexing across UL CCs for which the UL grant may be transmitted on that DL CC
    - Applicable only to LTE-A UEs.

Decision: The document is noted.

R1-103629	PHICH Resource Indexing with UL CA	Samsung	

The document was presented by Aris Papasakellariou from Samsung and proposes that, when one DL CC conveys PHICH in response to PUSCH in multiple UL CCs then, for PHICH resource mapping, the PRBs in the multiple UL CCs are numbered either serially (modulo $N_g \cdot N_{\mathrm{RB}}^{\mathrm{DL}}$) or with CC-specific offsets.

Decision: The document is noted.

R1-103715	Handling PHICH collisions in Carrier Aggregation	Sharp	(R1-103202)

The document was presented by … from Sharp and states that an additional mechanism for handling PHICH collision is needed.

- HARQ bundling and adaptive transmission can be a good complement to the already agreed cyclic shift mechanism to alleviate the PHICH collision problem.

Decision: The document is noted.

All remainaing contributions came to the conclusion that there is no need for a standardized solution for handling PHICH collisions, as stated by Mr Chairman.

Companies in favor of standardized solutions: Sharp, Alcatel-Lucent, Samsung, Qualcomm
Companies against standardized solutions: Motorola, Ericsson, ST-Ericsson, InterDigital, Intel, TI, CATT, Huawei, NSN, Nokia, Panasonic, LGE, MediaTek, NEC

Conclusions:
- Working assumption is confirmed that a single set of PHICH resources is shared by all UEs (Rel-8 to Rel-10).
- No consensus for additional standardised mechanism for handling PHICH collisions in Rel-10.

R1-103862	PHICH collision handling for carrier aggregation	Intel Corporation (UK) Ltd	

The document was presented by … from Intel and shows simulation results that there is no need to specify additional mechanisms to handle PHICH collision issue, either for dynamic transmissions or SPS transmissions.

Decision: The document is noted.

Not treated.

R1-103465	PHICH collision in LTE-A	CATT	
R1-103501	On PHICH for carrier aggregation	Ericsson. ST-Ericsson	
R1-103779	PHICH mapping	Nokia, Nokia Siemens Networks	
R1-103826	Views on LTE-A PHICH collision handling	NEC Group	
R1-103904	PHICH collision handling in carrier aggregation	HTC	
R1-103936	PHICH Resource Selection for LTE-A	Motorola	
R1-103955	PHICH Resource Mapping in Carrier Aggregation	LG Electronics	
R1-104075	PHICH resource allocation in LTE-A	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

6.2.3 PDCCH

6.2.3.1 Blind decoding and search spaces

Search space design details

R1-103432	Search space design for cross-CC scheduling	Huawei, CMCC	

The document was presented by Ms Elean Fan from Huawei and proposes that starting CCE index for each search space is independently derived and randomized using hashing function.

Decision: The document is noted.

R1-103466	PDCCH search space design in LTE-A	CATT	

The document was presented by Zukang Shen from CATT and draws the following proposals:
- It is supported in Rel-10 that the serving eNB can semi-statically configure the number of PDCCH candidates for each CCE aggregation level. Such a configuration is UE specific.

- Interleaved search space placement is not preferable due to the issue of search space ambiguity during DL/UL CC set reconfiguration or CC activation/deactivation.

Decision: The document is noted.

R1-103503	On search space design for carrier aggregation	Ericsson. ST-Ericsson	

The document was presented by Daniel Larsson from ST-Ericsson and proposes:

- In case CIF is not configured the common search space and UE specific search space is defined as in Rel-8/9.
- In case CIF is configured the common search space is defined as in Rel-8/9.
- The UE specific search spaces for a UE in case CIF is configured are placed according to the Rel-8 hashing function and each component carriers' UE specific search space is offset from each other according to the CIF given by the following equation $L \cdot \{(Y_k + m + 16 \cdot CIF_{index}) \bmod \lfloor N_{CCE,k} / L \rfloor\} + i$

Decision: The document is noted.

R1-103577	PDCCH search space for cross-carrier scheduling in LTE-A	ZTE	

The document was presented by … from ZTE and proposes that, from the viewpoint of blocking probability and CCE utilization, the distributed scheme (more distributed way to locate the search spaces of each component carrier) for UE-specific search spaces should be considered in case of cross-carrier scheduling. The same hashing function as in R8 to define the starting CCE index for each component carrier should be supported.

Decision: The document is noted.

R1-103630	PDCCH Search Space Design for CA	Samsung	

The document was presented by Aris Papasakellariou from Samsung and proposes the following.

- With cross-carrier scheduling, the total UE-dedicated search space consists of individual UE-dedicated search spaces, each corresponding to each cross-scheduled cell.
- With cross-carrier scheduling, $S_k^{(L)} = L \cdot \{(Y_k + m + f(I)) \bmod \lfloor N_{\mathrm{CCE},k} / L \rfloor\} + i$ or $Y_k = \left(A\left(Y_{k-1} + f(I)\right)\right) \bmod D$ can be selected for each UE-dedicated search space, where $f(I)$ is a function of the CIF.

Decision: The document is noted.

R1-103746	Search space for cross carrier scheduling	Panasonic	update of R1-102852

The document was presented by … from Panasonic and proposes to use one hashing function and UE-specific offset for multiple PDSCH/PUSCH CCs.

Decision: The document is noted.

R1-103780	On UE specific search space definitions for cross-CC scheduling for carrier aggregation	Nokia, Nokia Siemens Networks	

The document was presented by Lars Lindh from Nokia and proposes that the search space definition in case of cross-CC scheduling is defined as:

- Search spaces in case of cross-CC scheduling is derived from the carrier index (CI), independent on the number of configured and/or activated CCs.
- Search spaces for different component carriers are fully non-overlapping.
- If possible, concatenation of search spaces should be the primary target.

Decision: The document is noted.

R1-103827	Discussions on blind decoding and search spaces	NEC Group	

The document was presented by … from NEC and can be summarised as follows:

- Interleaved search spaces should be ruled out for LTE Rel-10. The Rel-8 search space placement in the PDCCH CC should not be altered due to cross-carrier scheduling.
- Offset-based placement of CC-specific search spaces in a CC is adopted. Further details are FFS.

Decision: The document is noted.

R1-103864	Evaluation on PDCCH Search Space Design	Intel Corporation (UK) Ltd	

The document was presented by … from Intel and concludes:

- The single hashing function with the consecutive assignment can show the better performance in the self-overlapping ratio than the multiple hashing functions, which can be one option to the PDCCH search spaces for the aggregated CCs;
- The proposed option 1 of the multiple hashing functions can demonstrate the good performance in the self-overlapping ratio over the other options of the multiple hashing functions, which can also be another option to the PDCCH search spaces for the aggregated CCs when the multiple hashing functions are adopted.

Decision: The document is noted.

R1-103925	Further Details on PDCCH Design with CIF	Motorola	

The document (section 2.1) was presented by Ravikiran Nory from Motorola and proposes the following.

- For a CC configured with CIF, additional UESS starting positions corresponding to each cross scheduled CC are determined by adding an offset to Rel8 UESS starting position for different aggregation levels.

Decision: The document is noted.

R1-103957	UE-specific Search Space Design for Cross-Carrier Scheduling	LG Electronics	

The document was presented by Ms… from LGE and draws a preference to the following UE-specific SS design for the cross-carrier scheduling.

- On top of the single hashing function based UE-specific SS structure, interlacing within a SS and UE-specific offset between SSs can be considered futher to apply *sparseness* on SS structure.

Decision: The document is noted.

R1-103990	Search space design in carrier aggregation	Potevio	

The document was presented by … from Potevio and is an attempt for defining the hashing function design of SS in carrier aggregation.

Decision: The document is noted.

R1-104041	Location of UE-specific search space	Fujitsu	

Same conclusion as Samsung and Huawei.

Decision: The document is noted.

R1-104054	Search Space for Carrier Aggregation	Research In Motion UK Limited	

The document was presented by Ms Youn Heo from RIM and lists three possible alternatives, all feasible to be implemented without introducing significant modifications on Rel-8 specification:

- Approach 1: Each CC-specific search space is pseudo-randomly located.
- Approach 2: One CC's search space is pseudo-randomly located based on the Rel-8 method and the other CCs' search spaces follow consecutively after the first CC search space.
- Approach 3: The starting CCE of the consolidated search spaces is pseudo-randomly located based on the Rel-8 method. PDCCH candidates for each CC are mapped to CCEs in an interleaved manner.

Decision: The document is noted.

R1-104012	Investigation on UE-specific Search Space for Carrier Aggregation	NTT DOCOMO	

The document was presented by Kazuaki Takeda from NTT DoCoMo and concludes that The use of the same and different hashing function generation methods was presented. Based on the results, no clear performance difference was observed.

Decision: The document is noted.

R1-103532	Further details on search space and blind decodes for CA	Qualcomm Incorporated	

The document was presented by Wanshi Chen from Qualcomm and proposes the following:

- For any CC carrying PDCCH, the starting CCE indices for all aggregation levels corresponding to its own UE-specific search space follow the same LTE Rel-8 design. For a CC carrying cross-carrier PDCCH, search spaces for other CCs are specified relative to the given CC utilizing offsets.

Decision: The document is noted.

Conclusions

From the above set of contributions, several options are on the table, as follows:

- Independent hashing functions (time-varying offset)
- Same hashing function (non-time-varying offset)
  - CC-specific offset (with or without concatenation)
  - Interleaved (with or without offset)

Very few companies to support interleaving and many demonstrating the drawbacks of interleaving
Time varying offset doesn't look so attractive to many. Huawei do not agree to exclude it.
Discussion occurred having CC-specific offset signalling → Signalling is excluded

Finally the following is agreed:

- Same hashing function (offset between search spaces for different CCs is not a function of the subframe number)
  - CC-specific offset
    - Offset is a function of (at least) CIF
      - Details could be confirmed later this week if a way forward is available
    - No additional RRC signalled parameters
    - Additional refinements FFS

Friday 2nd
No further progress on the details. FFS until RAN1#62

Not treated.

R1-103433	Summary of PDCCH BD reduction methods on DSS	Huawei	
R1-103502	Further consideration on blind decodes for carrier aggregation	Ericsson. ST-Ericsson	
R1-103578	PDCCH Blind decoding and search space on SCC	ZTE	
R1-103631	PDCCH Blind Decoding Operations for CA	Samsung	
R1-103632	Confusion Between DCI Formats for Different CCs. Tx Modes and Bandwidths	Samsung	
R1-103633	Effectiveness of virtual CRC	Samsung	
R1-103956	Considerations on PDCCH Blind Decoding in Carrier Aggregation	LG Electronics	
R1-104053	Reduction of Blind Decodes for Carrier Aggregation	Research In Motion UK Limited	
R1-104189	The actual number of blind decodes in LTE-A	Huawei	

6.2.3.2 Ambiguity issues and Configuration / reconfiguration of CIF

R1-103505	On collision between common and UE specific search spaces	Ericsson. ST-Ericsson	

The document was presented by Daniel Larsson from ST-Ericsson and deals with the case when there is a DCI format size ambiguity in case the common search space and the UE specific search space collide.

- In case of a collision between DCI format sizes between the common search space and the UE specific search space, the UE should always monitor the common search space.

Decision: The document is noted.

R1-103727	Handling of search space overlap for cross-carrier scheduling	LG Electronics	

The document was presented by … from LGE and suggests that, in case of overlap between common and UE-specific search spaces in which the same size DCI formats are configured with C-RNTI, the DCI format with C-RNTI having no CIF should be configured not to be scheduled within the overlapped search space region.
Decision: The document is noted.

R1-103880	DCI format ambiguity in the overlapping region of common and UE-specific search spaces in cross-carrier scheduling	ETRI	

The document was presented by Young-jo Ko from ETRI and proposes the followings.

- In the overlapping region of CSS and USS with aggregation level 4 or 8, only USS PDCCHs are allowed to be transmitted.
- In the overlapping region of CSS and USS with aggregation level 1 or 2, the CSS PDCCH candidates having one of the first CCEs of USS PDCCH candidates as the starting CCE are not allowed to be transmitted.

Decision: The document is noted.

R1-103434	Analysis of Solutions for Handling DCI Format Ambiguity between CSS and UESS at Cross-Carrier Scheduling	Huawei, CMCC	

The document was presented by Ms Meng Zhao from Huawei and proposes the following two alternatives, in case CSS for a DCI format without CIF and UESS for a DCI format with CIF are overlapped and the payload sizes of the DCI formats scrambled by C-RNTI are the same:

- Only the DCI format in CSS is allowed to be transmitted at the overlapped region.
- Only the DCI format in UESS is allowed to be transmitted at the overlapped region only after the RRC reconfiguration period.

Decision: The document is noted.

R1-103467	Discussion on remaining issues for CIF in LTE-A	CATT	

The document was presented by Zukang Shen from CATT and proposes that:

- CIF is always present in the DCI formats in UE specific search space for a Rel-10 UE, irrespective whether cross carrier scheduling is enabled.
- If the CSS DCI and the UESS DCI are of the same payload size, only the CSS DCI can be transmitted the overlapping PDCCH candidates between CSS and UESS.
- No additional RAN1 specification is needed to resolve the DL/UL DCI ambiguity problem in Rel-10 and the same CIF value can be applied to the SIB2 paired DL/UL CCs.

Decision: The document is noted.

R1-103533	Configuring and reconfiguring CIF	Qualcomm Incorporated	

The document was presented by Wanshi Chen from Qualcomm and concludes that there is a number of solutions that would avoid the ambiguity problem in the transient where the CIF use is (re-)configured. The following is a list of possible implementation based solutions:

- Utilize DCI format 1A/0 in UE common search space
- eNB to transmit two DCI format sizes in the UE-specific space addressing the same PDSCH, one with CIF and the other one without CIF
- Sequential reconfiguration of CCs, so that the last CC is reconfigured only after the conformation of the completed reconfiguration of the other one(s) is received

Decision: The document is noted.

R1-103504	On configuration and reconfiguration of CIF	Ericsson. ST-Ericsson	

The document was presented by Daniel Larsson from ST-Ericsson and provides an analysis of the impact of configuration, de-configuration and reconfiguration of CIF. It is proposed that:

- Problems associated with reconfiguration of CIF shall be discussed in RAN 2
- All component carriers DCI formats in the UE specific search space shall carry CIF in case CIF is configured.

Decision: The document is noted.

R1-103576	Remaining issues on carrier indicator field	ZTE	

The document was presented by … from ZTE and can be summarized as follows:

- Reconfiguration issue can be avoided by implementation based solution.
- Restrict DCI formats in the UE-specific search space is preferred.
- RAN2 shall consider the solution for ambiguity between DCI formats for DL CC and UL CC when the CIF configuration is under discussion.

Decision: The document is noted.

R1-103634	CIF Configuration	Samsung	

The document was presented by Aris Papasakellariou from Samsung and considers the aspects of:

- Time uncertainty for configuration of CIF presence/absence and re/configuration of the CIF-to-CC mapping.
- UE-Common Search Space (CSS) and UE-Specific Search Space (SSS) overlap with cross-carrier scheduling.

The paper's conclusion is:

- If CIF re/configuration is not a frequent even in the system, implementation-based methods using the DCI formats 0/1A in the CSS can be used to perform scheduling (if needed) to the UE during the time uncertainty period. Otherwise, the DL/UL PCC should operate without CIF.
- For the DCI format ambiguity problem in case of CSS and SSS overlap, it is preferred that the UE assumes that the DCI format originates from the SSS.
- It should also be determined whether DCI format 0/1A are assumed to provide the initial transmission mode with CIF re/configuration (or CC activation) or whether the initial transmission mode is also configured with CIF re/configuration (or CC activation).

Decision: The document is noted.

R1-103747	CIF reconfiguration issue	Panasonic	resubmission of 2853

The document was presented by Akihiko Nishio from Panasonic and proposes that CIF is not added to PDCCH which assigns the same DL CC and paired UL CC.

Decision: The document is noted.

R1-103781	Reconfigurations and search spaces overlap conflicts	Nokia Siemens Networks. Nokia	

The document was presented by Mieszko Chmiel from NSN and proposes:

- The DCI size ambiguities during CIF addition/removal are handled via implementation based solutions
- In case of DCI type ambiguity due to UESS and CSS overlap, the UE assumes that the DCI in the CSS will be transmitted

Decision: The document is noted.

R1-103907	Review of CIF Reconfiguration	Philips	(R1-103365)

The document was presented by Tim Moulsley from Philips and concludes that, if reconfiguration of CIF is expected to be frequent (e.g. on handover), a standardised solution may be considered. The proposals are:

- Delay the reconfiguration of CIF for Format 0/1A until after the RRCConnectionReconfigurationComplete message is transmitted by the UE, or
- The UE monitors for DCI format 0/1A both with and without CIF (in UESSS) until format 0/1A is received with the new value of CIF.
    - If the UE capability allows, then other DCI formats can also be monitored both with and without CIF. Details FFS

Decision: The document is noted.

R1-103925	Further Details on PDCCH Design with CIF	Motorola	

The document was presented by Ravikiran Nory from Motorola and proposes the following

- For a CC configured with CIF, additional UESS starting positions corresponding to each cross scheduled CC are determined by adding an offset to Rel8 UESS starting position for different aggregation levels.
- When a UE is configured to receive PDCCH with CIF on a particular CC, CIF is included in the DCI of all PDCCH messages received in UESS(s) of that CC.

Decision: The document is noted.

R1-103958	Considerations on CIF Initialization and Reconfiguration	LG Electronics	

The document was presented by … from LGE and proposes that:

- The uncertain period caused by CIF presence and absence should be handled by the option in which CIF is not attached only DCI format 0/1A for non cross-carrier scheduling in UE-specific search space.
- For efficient CIF-related data and control transmissions, the CI-to-CC mapping should be reconfigured under the following rules:
    - The existing CI-to-CC mappings should be maintained during addition and removal of CCs

- The CIs for newly added CCs should be different from CIs simultaneously removed during the reconfiguration.

Decision: The document is noted.

R1-104013	UE-specific Search Space during CIF reconfiguration	NTT DOCOMO	

The document was presented by Hidekazu Taoka from NTT DoCoMo and concludes that the UE-specific SS on the PCC without the CIF can effectively eliminate the CIF reconfiguration problem without concern.
Decision: The document is noted.

R1-104190	Search Space sharing with CIF	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	(R1-104076)

The document was presented by … from Alcatel Lucent Shanghai Bell and proposes:

- To maximise the benefit of search space sharing, reserved bits may be considered to give the same DCI format regardless of the scheduled BW. This should be configurable, so that reserved bits are only used when the number of such bits is low, to avoid excessive overhead2.
- CSS overlap can be supported via a CC-specific CCE offset
- USS/CSS overlap can be supported via a fixed CCE offset

Decision: The document is noted.

Discuss offline (revisit Tuesday):

- whether it can be agreed that the baseline is no standardised solution in RAN1 for ambiguities related to CIF (re-)configuration.
- how to handle ambiguity in case of overlap between CSS and UESSS:

Thursday 1st
Conclusion on the ambiguity in case of overlap between CSS and UESSS:

R1-104233	Way forward on handling of overlap between search spaces	LGE, Philips, Nokia, Nokia Siemens Networks, Huawei, RIM, ETRI, Pantech, ZTE, Panasonic, Ericsson, ST-Ericsson, Samsung, CATT, Qualcomm, NTT Docomo	

The document was presented by Joon-Kui Ahn from LGE.
Decision: The document is noted and the "Unified proposal" is agreed as follows:

If a PDCCH candidate of CSS-DCI format without CIF and a PDCCH candidate of USS-DCI format with CIF both have the same payload size, scrambling by C-RNTI and the same starting CCE, the UE shall assume that only the PDCCH candidate of CSS-DCI format may be transmitted, and the UE shall assume that the PDCCH candidate of USS-DCI format will not be transmitted

Friday 2nd
Conclusion on configuration/reconfiguration

- It is considered that the available implementation-based methods are sufficient from a RAN1 point of view for handling ambiguities related to CIF (re-)configuration.

Not treated.

R1-103608	CIF field configuration and release	HTC	
R1-103609	CIF content mapping	HTC	
R1-103624	Details on CI-to-CC mapping	Mitsubishi Electric	
R1-103748	Details of CI-to-CC mapping	Panasonic	
R1-103959	Carrier Index (CI) Configuration per UE for Carrier Aggregation	LG Electronics	
R1-103960	Uplink CC-to-CI Mapping for Carrier Aggregation	LG Electronics	

R1-104077	Remaining Issues on CIF Configuration and Mapping	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

6.2.3.3 Other

Not treated.

R1-103635	PDCCH CC configuration for linkage between PDSCH/PUSCH and PDCCH	Samsung	
R1-103750	Cross carrier scheduling from SCC to PCC	Panasonic	
R1-104042	CIF inclusion in Msg0	Fujitsu	
R1-104113	On the need of PDCCH monitoring set	LG Electronics	

6.2.4 PUCCH

6.2.4.1 Method(s) for A/N multiplexing

R1-103908	Summary of email discussion on PUCCH A/N multiplexing for CA	Philips	

The document was presented by Tim Moulsley from Philips and provides the outcomes of the email discussion under [61-01-LTE-A].
Discussion (Question / Comment):
Decision: The document is noted. The link level simulation assumptions as listed in sections 2.1 and 2.2 are endorsed for evaluation of PUCCH A/N multiplexing schemes.
No further schemes than those listed in Section 2.3 are considered for Release 10 (DTX FFS).
For the purpose of the evaluation, use mapping tables for A/N from R1-104140.

Evaluation results

R1-103468	Performance evaluation of UL ACK/NACK multiplexing methods in LTE-A	CATT	

The document was presented by Zukang Shen from CATT and deals the ACK/NAK BER performance and multiplexing capacity of different ACK/NAK transmission schemes in Rel-10. it is proposed:

- One scheme between PUCCH format 2 and DFT-S-OFDM is supported as the ACK/NAK transmission scheme for Rel-10 CA.

Decision: The document is noted.

R1-103507	Evaluation of PUCCH proposals for carrier aggregation	Ericsson. ST-Ericsson	

The document was presented by Daniel Larsson from ST-Ericsson and recommends adopting a single CA PUCCH transmission scheme based on DFT-S-OFDM (SF=5) with codebook slowly adapted to the number of configured CCs for reliable Rel-10 system operation [R1-103506][R1-103508]
Decision: The document is noted.

R1-103534	Further link comparisons of multi UL-ACK transmission schemes in support of CA	Qualcomm Incorporated	

The document was presented by Wanshi Chen from Qualcomm and proposes the following for ACK/NAK multiplexing in support of CA:

- PUCCH format 1b with SF=4 is used to convey 2~3 HARQ-ACK bits
- PUCCH format 1b with SF=2 is used to convey 4~6 HARQ-ACK bits
  - channel selection is utilized in conjunction with SF reduction
- PUCCH format 2 is used to convey 8 or more HARQ-ACK bits
  - PUCCH format 2 is preferred over DFT-S-OFDM because of its backward compatibility and less specification efforts needed

Discussion (Question / Comment): Mr Chairman asked if we'd go for one scheme, which one be preferred? Qualcomm answered none.

Decision: The document is noted.

R1-104127	Evaluation on A/N multiplexing schemes	ZTE	(R1-103605)

The document was presented by … from ZTE and suggests that:

- Channel selection based on PUCCH format 1b is supported as ACK/NACK transmission scheme on PUCCH for up to 4bits ACK/NACK.
- An enhanced ACK/NACK transmission scheme on PUCCH based on PUCCH format 2 is also supported, at least for the case of >4 bits ACK/NACK.

Discussion (Question / Comment): Ericsson asked for the reason using different DTX detection methods for the different schemes? TI asked what kind of receiver has been considered? RMC receiver
Decision: The document is noted.

R1-103636	PUCCH HARQ-ACK Signal Transmission for DL CA	Samsung	

The document was presented by Aris Papasakellariou from Samsung and deals with the metrics of HARQ-ACK transmission methods in support of DL CA and proposes:

- Channel selection, with or without SF=2, is used for HARQ-ACK payloads up to 4 or 6 bits.
- PUCCH format 2 is used for HARQ-ACK payloads above 4 or 6 bits.
- HARQ-ACK sub-frame bundling is baseline for TDD.

Decision: The document is noted.

R1-103782	Multi-A/N performance comparison	Nokia Siemens Networks. Nokia	

The document was presented by Timo Lunttila from NSN and concludes:

- For the smaller payload sizes (up to ~6 bits) (enhanced) channel selection should be supported
- For the larger payload sizes Format 2 is the natural baseline
- As a performance optimized solution Multiple Sequence Modulation should be supported

Decision: The document is noted.

R1-103884	Evaluation of ACK/NACK transmission schemes for carrier aggregation	Huawei	

The document was presented by Fredrik Berggren from Huawei and shows an evaluation of candidate schemes (Channel selection/Enhanced channel selection/Spreading factor reduction/Format2/DFT-S-OFDM with SF=5) for CA ACK/NACK transmission under different channel models. Based on the performance, capacity and backward compatibility, it is proposed that

- When PUCCH payload size is 3~6 bits, Enhanced channel selection/Channel selection is used.
- When PUCCH payload size is larger than 6 bits, Format 2 based scheme is used.

Decision: The document is noted.

R1-104128	Link-level evaluation of PUCCH proposals for Carrier Aggregation	InterDigital Communications, LLC	(R1-103945)

The document was presented by … from InterDigital and

- Rel-8 Channel Selection is the AN transmission scheme for N=3 and N=4 bits for FDD in Rel-10
- DFT-S OFDM SF=5 is the AN transmission scheme for N=5-10 bits in Rel-10

Decision: The document is noted.

R1-103961	Evaluation on A/N multiplexing schemes	LG Electronics	

The document was presented by SeungHee han from LGE and proposes that a single A/N multiplexing scheme of DFT-S-OFDM with RPF=1 is introduced for CA PUCCH regardless of the number of configured DL CCs in all A/N bit ranges.
Decision: The document is noted.

R1-104194	Comparison of PUCCH A/N multiplexing methods	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	(R1-104078)

The document was presented by Mrs Jungah Lee from Alcatel-Lucent and concludes as follows:

- For small payload sizes (≤ 5 bits)
  - Channel selection has good link level performance. But the resources needed increases with the number of bits significant impact on multiplexing capacity.
  - PUCCH Format 2 and DFT-S-OFDM outperforms SF=2.

        - DFT-S-OFDM slightly outperforms PUCCH Format 2 but smaller multiplexing capacity.
    - SF=2 is a good compromise solution between required SINR and multiplexing capacity.
- For large payload sizes
    - DFT-S-OFDM outperforms PUCCH Format 2 for the channels simulated (EPA3/ETU30)

Decision: The document is noted.

R1-104015	Investigation on PUCCH Format for Full A/N Transmission	NTT DOCOMO	

The document was presented by Yoshihisa Kishiyama from NTT DoCoMo and provides the following comparison:

Format	Shortened format		Performance
	Applicability	Operation	
PUCCH format 2 based	Possible (Multiplexing capability and number of RS symbols are retained)	UE-specific	Worse for relatively large payload size (> 5 bits) (FFS improvement by multi-sequence modulation)
DFTS-OFDM based	Possible (Either spreading factor reduction or RS symbol removal is required in the second slot)	Cell-specific	Better for relatively large payload size (> 5 bits)

Decision: The document is noted.

Mr Chairman thanked companies for providing simulations results although time to perform such simulations has been rather short. Prior to any conclusion, Mr Chairman suggested to look at more papers:

R1-103751	ACK/NACK transmission schemes on PUCCH	Panasonic	

The document was presented by Seigo Nakao from Panasonic and proposes the followings.

- PUCCH overhead (multiplexing capacity) should be considered when designing the A/N transmission scheme(s) for 2 DL CCs.
- Channel selection and large payload size format should be supported as A/N transmission schemes in release 10
- Even when UE is configured for carrier aggregation, it shall use release-8 ACK/NACK transmission scheme if it receives only one DL assignment for PCC
- Channel selection should be as simple as possible. Only the changes on the mapping rules should be considered in release 10. Consequently, channel selection supports up to 4 DL CCs
- Large payload size format should support 2 to 5 DL CCs.

Discussion (Question / Comment): Philips commented the attractiveness of bullet 3 but problem may occur if, in case of network error, more than one DL assignment is transmitted.
Decision: The document is noted.

R1-103934	Uplink ACK/NACK Transmission Format for Carrier Aggregation	Motorola	

The document (section 2) was presented by Rapeepat Ratasuk from Motorola and proposes the following recommendations:

- For FDD, reuse existing Rel-8 UL transmission formats for UL ACK/NACK in LTE-A.
- For FDD, PUCCH Format 1 with code selection and PUCCH Format 2 are supported for UL ACK/NACK in LTE-A.

Discussion (Question / Comment): Samsung believes that it should be possible to accommodate FDD and TDD at once.
Decision: The document is noted. Mr Chairman then suggested to further look at the TDD papers.

R1-103436	A/N transmission in TDD CA	Huawei	

The document was presented by Ms Meng Zhao from Huawei and focuses on UL A/N transmission for carrier aggregation in LTE-A TDD system. The following is proposed:

- The full A/N bundling should be supported for the power-limited case.
    - CC first DAI design is preferred.
- The ACK/NACK multiplexing with channel selection is supported for A/N feedback with a relatively small payload.

  - For the reason of less bundled A/N bit required and the less average number of bundled PDSCHs, partial bundling in the CC domain within a sub-frame is preferred.
- The ACK/NACK multiplexing with joint coding is supported for A/N feedback with a relatively large payload.
- FFS on the need of PUSCH-triggered scheme to support the extreme case.

Decision: The document is noted.

R1-103469	UL ACK/NAK transmission for TDD with CA	CATT	

The document was presented by Zukang Shen from CATT and provides the following preferences for UL ACK/NAK feedback for LTE-A TDD with carrier aggregation:

- Frequency and spatial ACK/NAK bundling shall be considered to reduce ACK/NAK feedback bits.
- Two ACK/NAK feedback modes shall be supported:
  - For full ACK/NAK bundling mode, PUCCH format 1a/1b is used.
  - For ACK/NAK multiplexing mode, either PUCCH format 2 or the DFT-S-OFDM based scheme shall be supported.
- Full ACK/NAK feedback shall be supported on PUSCH.

Decision: The document is noted.

R1-103784	UL ACK/NAK Feedback for Non-Power-Limited UE in LTE-A TDD	Nokia, Nokia Siemens Networks	

The document was presented by … from Nokia and proposes:

- ACK/NAK bundling across spatial code-words is enabled.
- ACK/NAK 2-state feedback is the baseline.
  - DTX state compression is desirable if the use cases for explicit DTX feedback are justified.
- Existing PUCCH formats are the baseline as ACK/NAK containers.
  - MSM or DFT-s-OFDM is FFS as ACK/NAK container for extremely DL-heavy cases.

Decision: The document is noted.

Mr Chairman highlighted the main topics being kept in mind for further off line discussions with the expectation to reach a way forward by Thursday. Observations are as follows:

- Generally good alignment between the different simulation results shown by companies
- For large payload sizes, DFT-S-OFDM is generally shown to perform the best
  - Choice is between DFT-S-OFDM and Format 2 is basically between performance and possible specification effort
- For small payload sizes, channel selection is generally performing the best (although the performance difference is generally small)
  - Choice is between maintaining a single format (same as with large payload sizes) and performance / similarity with Rel-8 for simple implementation.
- Discuss further offline to reach way forward, keeping overhead in mind

Thursday 1st

R1-104215	Way forward on CA PUCCH	CATR, CATT, CMCC, Ericsson, InterDigital, ITRI, LG Electronics, LG-Nortel, MediaTek, Potevio, Sharp, ST-Ericsson	

The document was presented by Zukang Shen from CATT and proposes for carrier aggregation and ACK/NAK transmission on PUCCH

- A single PUCCH format based on DFT-S-OFDM is supported for HARQ feedback corresponding to DL assignments on multiple carriers
- FFS for power limited UEs

Discussion (Question / Comment): Panasonic didn't co-source neither R1-104215 nor R1-104217 willing to see a consensus coming out from the debate.

Decision: The document is noted.

R1-104217	Way forward on UL HARQ-ACK transmission	ETRI, Huawei, Motorola, Nokia, Nokia Siemens Networks, Pantech, Qualcomm, RIM, Samsung, ZTE	

The document was presented by Aris Papasakellariou from Samsung and proposes to reuse Rel-8 based PUCCH formats

- For 3-4 bits → PUCCH format 1b with channel selection
- For 5-6 bits → FFS between Format 2 and PUCCH format 1b with enhanced channel selection
- For 7-10 bits → PUCCH Format 2
    - FFS if more than 10 bits are supported

Discussion (Question / Comment):
Decision: The document is noted.

Aiming at getting a consensus, Mr Chairman proposed:

- For up to 4bits: PUCCH format 1b with channel selection
- 5 to 10 bits: DFT-S-OFDM

Proposal further evolved as

- For Rel-10 UEs that support up to X A/N bits: PUCCH format 1b with channel selection
- For Rel-10 UEs that support more than X A/N bits: DFT-S-OFDM
- X=4 for FDD
- X=FFS for TDD

X=4 for TDD is supported by Panasonic, LGE, Samsung, Philips, MediaTek

Agreement both for FDD and TDD

- For Rel-10 UEs that support up to 4 A/N bits: PUCCH format 1b with channel selection
- For Rel-10 UEs that support more than 4 A/N bits: DFT-S-OFDM

General

R1-103435	Explicit HARQ DTX feedback for CA	Huawei	

The document was presented by Ms Meng Zhao from Huawei and discusses the merits of explicitly signalling the DTX information of each component carrier. As DTX information can be important for the HARQ operation and the eNodeB scheduler, it is proposed that explicit DTX state should be signalled in the UCI. As for the resultant increased number of A/N bits, some special designs are needed to ensure both the HARQ performance and A/N transmission performance.
Discussion (Question / Comment):
Decision: The document is noted.

R1-103508	On ACK/NACK codebook performance for carrier aggregation	Ericsson. ST-Ericsson	

The document was presented by Daniel Larsson from ST-Ericsson and deals with performance comparison of fast codebook adaptation and slow encoding codebook adaptation with dynamic decoding. Based on the evaluation results, it is proposed that slow codebook adaptation based on the number of configured component carriers is adopted for Rel-10 LTE.
Discussion (Question / Comment):
Decision: The document is noted.

Consider further:

- whether Rel-8 PUCCH resources are used for A/N feedback if the UE receives only a DL PCC assignment (regardless of the number of configured and/or activated DL CCs)
- whether explicit "DTX" signalling is needed
- what is the update rate for the ACK/NACK codebook (semi-static or dynamic)

Thursday 1st : Not actually further discussed

Power limited case

R1-103752	Support of UL ACK/NACK bundling across CC for carrier aggregation	Panasonic	Update of 2857

The document was presented by Seigo Nakao from Panasonic and discusses the limited UL ACK/NACK transmission method on PUCCH in carrier aggregation for power limited UEs. The proposal for CC bundling scheme is:

- ACK/NACK bundling across CCs for power limited case is supported in release 10 without introducing new DAI
- For bundling across CCs, consider to avoid the reservation of multiple ACK/NACK resources by linking the PUCCH resources only to the CCEs in Pcells
    - In case that UE does not receive DL assignment for Pcell, perform the DTX of ACK/NACK

Decision: The document is noted.

R1-103472	ACK/NAK bundling for FDD with CA	CATT	

The document was presented by Zukang Shen from CATT and concludes that a certain percentage of UE may not be able to support ACK/NAK multiplexing due to its power limitation on UL transmissions. Since the application of DL carrier aggregation is rather independent of the UE PUCCH geometry, it is proposed that full ACK/NAK bundling, i.e. 1 or 2 bundled ACK/NAK feedbacks, shall be supported for FDD with carrier aggregation in Rel-10.
Decision: The document is noted.

R1-103790	On the need for cross-carrier A/N bundling	Nokia Siemens Networks. Nokia	

The document was presented by Timo Lunttila from NSN and discusses the need for cross-carrier ACK/NACK bundling for the power limited UEs. It is proposed the following actions:

- Support cross-carrier A/N bundling for power-limited UEs
- Support cross-carrier A/N bundling w/o DAI bits
- Cross-carrier A/N bundling is applied when multiplexing multi-A/N with CQI or SR
- Cross-carrier A/N bundling is applied only for PUCCH format 1a/1b based schemes

Decision: The document is noted.

R1-103885	On the necessity of ACK/NACK bundling for carrier aggregation	Huawei	

The document was presented by Ms Meng Zhao from Huawei and deals with the PUCCH SINR geometry. It is found that a significant percentage of UEs may not be able to support A/N multiplexing. Considering the interference condition and transmission power may be very different between UL and DL, A/N bundling will be advantageous on making eNodeB more flexible to configure UE with DL carrier aggregation. A/N bundling may be helpful to deal with the simultaneous transmission of multiple A/N and other UCI types. Besides, it is possible to support A/N bundling in LTE-Advanced without introducing extra DCI overhead. Hence it is proposed that cross-carrier A/N bundling shall be supported for carrier aggregation in LTE-Advanced.
Decision: The document is noted.

Proposal:

- A/N bundling across CCs is supported for the case of power-limited UEs.
  - Support: Panasonic, CATT, NSN, Nokia, Huawei, Ericsson, ST-Ericsson, LGE, InterDigital, Sharp, Pantech
  - Do not support: Mediatek, Qualcomm, Samsung (would like to think more), Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Motorola

PUCCH resource allocation

R1-103473	PUCCH resource allocation for CA	CATT	

The document was presented by Zukang Shen from CATT and deals with dynamic ACK/NAK resource assignment with carrier aggregation and concludes that, with a single UE-specific PUCCH CC:

- A system-specific one-to-one DL/UL CC linkage for dynamic ACK/NACK resource reservation shall be supported.
- A set of ACK/NAK resources are pre-configured for each UE configured with multiple DL CCs, and the ACK/NAK resource used in an UL subframe is indicated by the corresponding PDCCH.
- PDCCH can indicate the UE to use the implicit PUCCH format 1a/1b resource on the UL PCC.

Decision: The document is noted.

R1-103637	PUCCH HARQ-ACK Resource Mapping for DL CA	Samsung	

The document was presented by Aris Papasakellariou from Samsung and proposes:

- If all DCI formats for PDSCH reception at a UE are transmitted in the DL PCC, the Rel-8 FDD HARQ-ACK resource mapping in the PUCCH applies in case of Rel-8 TDD channel selection.
- If some DCI formats for PDSCH reception at a UE are transmitted in DL SCCs and HARQ-ACK resource compression is applied, the following alternatives are considered:
  - Explicit HARQ-ACK resource indexing (complemented by implicit signaling in case of channel selection).

- Implicit HARQ-ACK resource indexing based on the Rel-8 one in the Rel-8 HARQ-ACK region for the DL PCC and in a second HARQ-ACK region for the DL SCCs using the smallest CCE number carrying the corresponding PDCCH in the DL PCC in case of Rel-8 TDD channel selection.

Decision: The document is noted.

R1-103728	Resource allocation for ACK/NACK PUCCH	LG Electronics	

The document was presented by Joon-Kui Ahn from LGE and suggests:

- For the UE operating with multiple CCs, explicit ACK/NACK resource allocation and implicit ACK/NACK resource allocation should be the baseline. In addition, ACK/NACK resource sharing between multiple UEs should be considered.
- A UE transmits ACK/NACK bits via Rel-8 PUCCH format 1a/1b following Rel-8 ACK/NACK transmission rule (that is, using the Rel-8 ACK/NACK PUCCH resource linked to the scheduling PDCCH) when the UE detects only a self-scheduling PDCCH in the DL PCC.
- Uplink ACK/NACK bundling across the downlink carriers should be supported for the power limited UEs.

Decision: The document is noted.

R1-103783	On the PUCCH Resource Allocation and A/N Codebook Size for Carrier Aggregation	Nokia Siemens Networks. Nokia	

The document was presented by Timo Lunttila from NSN and proposes the following actions:

- A/N signalling mode is configured in UE-specific manner
- Explicit resource allocation is the baseline RA scheme available for all channel types and the only option for large PUCCH formats (e.g. PUCCH format 2 or new physical channel(s)).
- Hybrid RA is supported with channel selection and cross-carrier A/N bundling
- Explicit allocation for Multi-A/N resources on PUCCH is made using RRC-level signalling
- A/N codebook size is based on the number of configured CCs in the cases when channel selection has not been configured
- A/N codebook size is based on maximum number of DL CCs in the cases when channel selection has been configured.

Decision: The document is noted.

R1-103934	Uplink ACK/NACK Transmission Format for Carrier Aggregation	Motorola	

The document (section 3) was presented by Rapeepat Ratasuk from Motorola and proposes the following recommendation:

- Consider whether ACK/NACK resource assignment should be implicitly or explicitly provided in case of assignment in multiple downlink carriers. Hybrid scheme can also be considered to reduce the overhead.

Decision: The document is noted.

R1-104016	Uplink ACK/NACK Resource Assignments for Carrier Aggregation	NTT DOCOMO	

The document was presented by Yoshihisa Kishiyama from NTT DoCoMo and proposes:

- Radio resources for joint coding based A/N transmission are explicitly assigned for each UE using RRC signaling.
- For the explicit resource assignments, additional dynamic resource indication using the PDCCH is beneficial.
- For channel selection based A/N transmission, implicit resource assignment is used at least when only the DL PCC is used to send the PDCCH by configuring the CIF.
- Piggy back onto the PUSCH should be supported irrespective of A/N transmission schemes.

Decision: The document is noted.

Partly related to PUCCH format discussion, said Mr Chairman. Continue discussion on implicit vs. explicit PUCCH resource allocation. Revisit after agreement on PUCCH format.

Not treated.

R1-103470	DAI Design for LTE-A	CATT	
R1-103506	PUCCH design for carrier aggregation	Ericsson. ST-Ericsson	

R1-103535	Number of bits conveyed on multi-bit ACK PUCCH format	Qualcomm Incorporated	
R1-103570	Discussion on PUCCH designs for carrier aggregation in LTE-A	MediaTek	
R1-103638	UL HARQ-ACK Multiplexing: Mapping for 4 Bits	Samsung	
R1-103639	DAI design for LTE-A TDD	Samsung	
R1-103640	Discussion on ACK/NACK transmission method for LTE-A TDD	Samsung	
R1-103693	HARQ-ACK Multiplexing Schemes for Carrier Aggregation	Texas Instruments	
R1-104192	Combined Component Aggregated HARQ A/N	Sharp	(R1-103716)
R1-103785	PUCCH Format 1a/1b Resource Allocation in LTE-A TDD	Nokia, Nokia Siemens Networks	
R1-103786	UL ACK/NAK Feedback in LTE-A TDD	Nokia, Nokia Siemens Networks	
R1-103787	Evaluation of UL ACK/NAK Bundling Ways in LTE-A TDD	Nokia, Nokia Siemens Networks	
R1-103788	UL ACK/NAK Feedback for Power-Limited UE in LTE-A TDD	Nokia Siemens Networks. Nokia	
R1-103886	A/N Codebook Design for Carrier Aggregation using format 2 and DFT-S-OFDM	Huawei	
R1-104014	Uplink ACK/NACK Transmission Schemes for Carrier Aggregation	NTT DOCOMO	

6.2.4.2 Transmit diversity

Not treated.

R1-103437	SORTD resource allocation for PUCCH format 1a/1b	Huawei	
R1-103471	PUCCH Format 1/1a/1b Resource Allocation with SORTD	CATT	
R1-103536	UL-ACK resource allocation for DL transmission with single CCE and UL TxD	Qualcomm Incorporated	
R1-103641	Transmit Diversity for PUCCH Format 1/1a/1b.	Samsung	
R1-103717	Resource Allocation for PUCCH Format 1a/1b SORTD	Sharp	
R1-103754	PUCCH resource indication for SORTD and carrier aggregation	Panasonic	Update of 2860
R1-103755	SORTD configurations for ACK/NACK information and SRI	Panasonic	Update of 2859
R1-103789	SORTD resource allocation	Nokia Siemens Networks. Nokia	
R1-103962	Resource Allocation for SORTD	LG Electronics	

6.2.4.3 Other

Periodic CQI

R1-103537	CQI for CA	Qualcomm Incorporated	

The document was presented by Wanshi Chen from Qualcomm and proposes the following:

- Cycling through the CQI/PMI/RI feedbacks of all corresponding DL component carriers is applied. Exact information that is conveyed in the feedback is FFS

- CQI/PMI/RI feedback among multiple DL CCs can be grouped into sets depending on the UE transmission mode (SIMO, MIMO), or some other criterion, where a specific CQI configuration within the set is applied
- When a component carrier is deactivated, UE stops transmitting on the CQI/PMI/RI reporting instances corresponding to the deactivated carrier. When component carrier is activated, UE transmits on the CQI/PMI/RI reporting instances corresponding to the activated component carrier, according to the current CQI/PMI/RI configuration.

Discussion (Question / Comment): NSN wondered whether specifying cycling rule is required and commented that not only cycling but different periodicities should be considered.
Decision: The document is noted.

R1-103474	CQI feedback for LTE-A	CATT	

The document was presented by Zukang Shen from CATT and concludes:

- For periodic CQI feedback, since CQIs of multiple carriers shall be reported, the amount of feedback is expected to increase andcan be accommodated either by increasing the CQI payload size in one reporting instance, or by feeding back CQI over multiple reporting instances. In particular, PUSCH based CQI transmission scheme with time-domain CDM shall be considered as a new CQI transmission scheme to support larger CQI payload size in Rel-10, since it provides higher CQI multiplexing capacity than the Rel-8 PUSCH based aperiodic CQI transmission scheme.
- For aperiodic CQI feedback, UE shall feed back CQIs for multiple DL CCs in a single UL subframe, when the CQI request bit in the corresponding UL grant is set to 1.

Decision: The document is noted.

R1-103438	CQI/PMI/RI reporting for carrier aggregation	Huawei	

The document was presented by Fredrik Berggren from Huawei and proposes that:

- Aperiodic reporting is supported for all activated DL CCs.
- The CQI request bit in the UL grant is used for triggering aperiodic CQI reporting. It is FFS whether triggering aperiodic CQI reporting can be supported by the carrier activation MAC CE.
- Periodic reporting periods and offsets are configurable per CC.

Decision: The document is noted.

R1-103642	Support for Increased CSI Feedback Payloads in PUCCH	Samsung	

The document was presented by Aris Papasakellariou from Samsung and concludes that the periodic PUSCH is just a PUCCH format for supporting large payloads.

- Proposal: Consider the definition of a new PUCCH format to support larger than in Rel-8 CSI payloads.
- Proposal: Avoid introducing new sub-frame structures – prioritize utilization of Rel-8 sub-frame structures.

Decision: The document is noted.

R1-103718	Periodic CQI Reporting for Multiple Component Carriers	Sharp	

The document was presented by John Kowalski from Sharp and proposes to:

- Impose a restriction on the minimum reporting interval for multiple CC reporting in Rel-10. The exact reporting interval is FFS.
- Impose a minimum aggregation level for periodic CQI reporting for multiple CCs. The aggregation level is FFS.
- Extend differential feedback reporting mechanism from Rel-8 for multiple CC CQI reporting at the same time instance.

Decision: The document is noted.

R1-103749	Periodic CQI for Carrier Aggregation	Panasonic	Resubmission of 2861

The document was presented by Alex Golitschek edler von elbwart from Panasonic and proposes to consider mainly a Release 8 PUSCH-based solution for multiple CQI/PMI/RI and a Release 8 PUCCH-based solution for prioritised single CQI/PMI/RI transmission for Release 10. It is observed that before introducing a new transmission format for the purpose of multiple periodic CQI reports per subframe, the scenario requiring such a format should be justified against the existing methods and formats.
Decision: The document is noted.

R1-103797	CSI reporting for Carrier Aggregation	Nokia Siemens Networks. Nokia	(R1-102952)

The document was presented by Timo Lunttila from NSN and makes the following proposals:

- Periodic CSI reporting on PUCCH is configured independently for each component carrier with RRC signalling similar to LTE Rel-8 (periodicity, subframe offset, reporting mode, resource allocation etc.)
- The CC specific bandwidth dependent subband sizes and the basic compression mechanisms defined for LTE Release-8 should remain supported in LTE-Rel10 with carrier aggregation.
- Detailed, Release-8 like CSI is reported for only one CC at the time. Additionally, including wideband CSI for other CCs should be considered.

Decision: The document is noted.

R1-104043	Considerations on Periodic CQI Feedback for Carrier Aggregation	Fujitsu	

The document was presented by … from Fujitsu and provides the following observations w.r.t Rel.8 DL CC cycling:

- There may be some restriction on the order of wideband CQI/PMI and subband CQI/PMI reporting if subband CQI/PMI is related to wideband CQI/PMI.
- The larger period of cycling can be minimized by using in CA system with small number of CC, for other case, different schemes such as PUCCH with larger payload may be used
- Feedback framework and concerned CSI-RS transmission offset between CC can be design for each CC configuration.

Discussion (Question / Comment): Panasonic commented that their preference is to avoid too many different schemes
Decision: The document is noted.

Proposal:

- For periodic CQI/PMI/RI reporting for CA, at least configuration of different (in time) PUCCH resources for reports for each CC is supported.
    - Additional possibilities are FFS until RAN1#62.

Friday 2nd
Hereabove proposal is agreed as baseline for further progress.

Not treated.

R1-103643	Concurrent transmission of Scheduling Request indicator and ACK/NACK information for LTE-Advanced	Samsung	
R1-103729	UCI multiplexing for LTE-A	LG Electronics	
R1-103756	Discussion on various UL transmission configurations	Panasonic	Update of 2863
R1-103757	Simultaneous transmission of Scheduling request indicator and ACK/NACK information for LTE-Advanced	Panasonic	Update of 2862
R1-103791	On the PUCCH Multiplexing Combinations for CA	Nokia Siemens Networks. Nokia	
R1-103887	Simultaneous transmission of CQI, ACK/NACK or SRI on PUCCH in Carrier Aggregation	Huawei	

6.2.5 UL Power Control

Not treated.

R1-103439	Uplink multi-antenna power control	Huawei	
R1-103440	Consideration of DCI 3/3A for Carrier Aggregation	Huawei	
R1-103441	Pathloss derivation for UL PC in LTE-A	Huawei	
R1-103475	Discussions on remaining details for LTE-A UL PC	CATT	
R1-103509	On use cases of DCI format 3/3A	Ericsson. ST-Ericsson	

R1-103538	Cross-carrier power control with DCI format 3/3A	Qualcomm Incorporated	
R1-103539	Power control for multi-antenna transmission	Qualcomm Incorporated	
R1-103603	Issues on UL TPC transmission for carrier aggregation	ZTE	
R1-103644	Path-Loss Derivation for CA	Samsung	
R1-103645	Cross-carrier UL PC for LTE-A	Samsung	
R1-103646	Power control for UL SU-MIMO	Samsung	
R1-103719	Issues with per-antenna uplink power control	Sharp	(R1-103205)
R1-103730	Cross carrier power control with DCI format 3/3A	LG Electronics	
R1-103731	TPC in multiple DL grants	LG Electronics	
R1-103743	Per UE PHR for carrier aggregation	MediaTek	
R1-103792	Remaining issues on uplink power control	Nokia Siemens Networks. Nokia	
R1-103888	Performance evaluation of approaches for multi-antenna power control	Huawei	
R1-103901	remaining aspect of UL power control	HTC	
R1-103914	UL Power Control for Multi-Antenna UE	Motorola	
R1-103963	Consideration on power control for UL multiple antenna transmission	LG Electronics	
R1-104017	CC-common TPC Command for UL Carrier Aggregation	NTT DOCOMO	
R1-104018	Uplink Power Control for Multi-antenna Transmission	NTT DOCOMO	
R1-104079	Clarification on power scaling	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-104080	Way Forward on cross-carrier power control	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, etc	
R1-104081	Power control for multiple antennas	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

6.2.6 PUSCH Resource allocation

R1-103540	Multi-cluster PUSCH transmission	Qualcomm Incorporated	

The document was presented by Wanshi Chen from Qualcomm and proposes that:

- For single Tx anntenna, support option 2 (i.e., number of clusters not limited by the signalling – with UL DCI format aligned with configured DL DCI formats)
- Support clustered PUSCH resource allocation for UL SU-MIMO

Discussion (Question / Comment): Motorola commented that their own simulation results w.r.t the proposed option, don't show too much performance gains.
Decision: The document is noted.

R1-103648	Number of Clusters and DCI Format for Non-Contiguous PUSCH Transmissions	Samsung	

The document was presented by Aris Papasakellariou from Samsung and proposes that support of non-contiguous RA is with 2 clusters and DCI format aligned with DCI format 0.
Decision: The document is noted.

R1-104225	Comparison of Non-contiguous PUSCH resource allocation techniques	Motorola	(R1-103919)

The document was presented by Ravikiran Nory from Motorola and proposes that Rel8 type 0/1 DL resource allocation scheme should be re-used for supporting UL non-contiguous PUSCH grants.
Decision: The document is noted.

R1-103793	Performance evaluation for clustered resource allocation	Nokia Siemens Networks. Nokia	

The document was presented by … from NSN and proposes the following:

- Cluster size should be N*2PRB. N is an integer number for each cluster.
- The maximum number of clusters is 2.
- UL DCI format should be aligned with DCI format 0.
- Resource allocation needs to restrict in such the maximum separation between clusters is half of system bandwidth.

Decision: The document is noted.

R1-103828	Maximum number of clusters and DCI format of non-contiguous UL RA for single Tx antenna	NEC Group	

The document was presented by Yoshikazu Kakura from NEC and shows preference for option 2 due to the larger throughput gain not by limiting the number of clusters up to 2. However, option1 can be considered if option2 has the significant drawbacks, as it still achieves large throughput gain compared to contiguous RA.
Decision: The document is noted.

Number of clusters

- 2 clusters
  - Samsung, NSN, Nokia, Huawei, LGE, Mitsubishi, AsusTek, MediaTek, Ericsson, ST-Ericsson, Pantech, RIM, ETRI, TI
    - If choice is between unlimited clusters and non-contiguous RA
      - Unlimited: Mitsubishi, LGE
      - Non-contiguous RA: Samsung, NSN, Nokia, Huawei, AsusTek, MediaTek, Pantech, RIM, ETRI, TI
- Unlimited:
  - Sharp, NEC, Motorola, Panasonic, Qualcomm, NTT DoCoMo, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Fujitsu
    - If choice is between 2 clusters and non-contiguous RA
      - 2: Sharp, NEC, Panasonic, NTT DoCoMo (CQI-based RA), Alcatel-Lucent, Alcatel-Lucent Shanghai Bell
      - Non-contiguous RA: Motorola, Qualcomm, Fujitsu

Mr Chairman warned the group that decision has to be taken during current meeting. Philips highlighted that the risk of non decision means no non-contiguous RA in Rel-10
Friday 2nd : Topic shall be readdressed at next meeting.

Not treated.

R1-103529	Signaling scheme for non-contiguous 2-cluster resource allocation.	ASUSTeK	
R1-103611	Comparison of non-contiguous UL RA signaling	Pantech	
R1-103612	Further details on the non-contiguous UL RA scheme with limited clusters	Pantech	
R1-103621	DCI format for multi-cluster PUSCH resource allocation	Mitsubishi Electric	
R1-103622	Details on multi-cluster PUSCH resource allocation schemes	Mitsubishi Electric	
R1-103647	Resource Allocation for Non-Contiguous PUSCH Transmissions	Samsung	
R1-103720	Views on Signalling for Non-contiguous PUSCH Resource Allocation	Sharp	
R1-103758	Discussion on inter-modulation issue for clustered PUSCH transmission	Panasonic	Update of 2867

R1-103759	Signaling for UL non-contiguous resource allocation	Panasonic	Resubmission of 2866
R1-103794	RA design for clustered allocation	Nokia, Nokia Siemens Networks	
R1-103795	Output power back-off aspects for clustered PUSCH	Nokia Siemens Networks. Nokia	
R1-103889	UL Non-contiguous Transmission for CA	Huawei	
R1-103935	Resource allocation schemes for non-contiguous PUSCH	Motorola	
R1-103964	Non-Contiguous PUSCH Resource Allocation Scheme on LTE-A	LG Electronics	
R1-104019	Further Discussion on Signaling to Support Non-contiguous RB Allocation	NTT DOCOMO	
R1-104224	PUSCH resource allocation	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	(R1-104082)

6.2.7 UCI on PUSCH

R1-103694	UCI Transmission on PUSCH for Carrier Aggregation	Texas Instruments	

The document was presented by Anthony Ekpenyong from TI and draws the following preferences:

- The UE transmits periodic UCI on the UL PCC when it is scheduled for PUSCH transmission on the UL PCC. In the event that a grant is not detected for the UL PCC the UE transmits UCI on the CC with the largest UL grant. Either method may be combined with eNB scheduling to avoid ambiguous scenarios.
- As baseline a 1-bit aperiodic CQI request refers to one DL CC. The CSI-CC can be indicated by SIB2-linkage.
- For full eNB flexibility a bit map could be used to select a subset of CCs for CSI feedback.
- To reduce testing complexity aperiodic CQI request without UL-SCH data is restricted to CSI report for the DL CC conveying the UL grant.
- For the case of multiple UL grants, aperiodic CQI request is only triggered in only one UL grant.

Decision: The document is noted.

R1-103649	PUSCH Selection for UCI Multiplexing with UL CA	Samsung	

The document was presented by Aris Papasakellariou from Samsung and deals with the selection of the PUSCH conveying UCI in a sub-frame in case of no "CQI Request" or in case of multiple "CQI Requests" (for a single "CQI request", UCI is by default in the respective PUSCH) and proposes the following:

- The UE selects for UCI inclusion the PUSCH minimizing the absolute or the relative UCI overhead.
- It is FFS whether:
  - eNodeB indication of the selected PUSCH should be also supported (the determination by a rule can then be complementary in case the UE misses the respective PDCCH).
  - The PUSCH transmission in the Pcell, if any, should be prioritized.

Discussion (Question / Comment): Overhead saving estimation was questioned (CATT).
Decision: The document is noted.

R1-103475	Discussions on remaining details for LTE-A UL PC	CATT	

The document (section 2) was presented by Zukang Shen from CATT and proposes that UCI shall be transmitted on the UL PCC PUSCH if scheduled, for a Rel-10 UE without simultaneous PUCCH and PUSCH transmission configured, when PUSCH are scheduled on multiple UL CCs in a given sub-frame.
Decision: The document is noted.

Long debate on whether having PUCCH on one CC simultaneously with PUSCH on another CC is required and is aligned with RAN4 understanding.

Proposed working assumption:

- PUCCH on one CC simultaneously with PUSCH on another CC is supported as part of CA

Proposal LS to RAN4:

- PUCCH on one CC simultaneously with PUSCH on another CC is understood to be a different case from the simultaneous PUCCH+PUSCH and non-contiguous PUSCH recently addressed by RAN4 and RAN#48.

- Therefore from RAN1 point of view PUCCH on one CC simultaneously with PUSCH on another CC is included in CA and RAN1 would like to know if it should be aware of any restrictions from RAN4 point of view.

Discuss further offline - revisit later in the week.

R1-103796	UCI mapping on PUSCH with Carrier Aggregation	Nokia Siemens Networks. Nokia	

The document was presented by Timo Lunttila from NSN and proposes the following:

- PUSCH carrying UCI is signalled implicitly based on pre-defined priority between UL CCs
- UL PCC has the highest priority
- Priority order between UL SCCs can be based on pre-defined component carrier indexes.

Decision: The document is noted.

R1-103890	UCI on PUSCH for carrier aggregation	Huawei	

The document was presented by Fredrik Berggren from Huawei and concludes that:

- UCI multiplexing on PUSCH should be supported such that simultaneous PUSCH and PUCCH transmission is not mandatory.
- The UL CC for UCI multiplexing on PUSCH is non-fixed.
- The selection of PUSCH for UCI is based on UL CC priorities known to the eNodeB and UE.
- A PUSCH scheduled for carrying aperiodic CSI always has the highest priority.

Decision: The document is noted.

R1-104055	UCI Transmission in the Presence of UL-SCH Data	Research In Motion UK Limited	

The document was presented by Ms Youn Heo from RIM and draws the following conclusions:

- The baseline configuration is that UCI is transmitted on a scheduled PUSCH resource regardless of which CCs are scheduled.
- The eNB and UE should know exactly which UL CC is used as UCI CC for a given UCI transmission.
- Either the order of UL CCs or a rule for the selection of the UCI CC should be supported instead of semi-statically configuring a certain UL CC as UCI CC.
- The puncturing loss due to a large number of UCI bits should be investigated. If this puncturing loss is severe, we should consider transmitting UCI on a CC which does not transmit UL-SCH data sensitive to the puncturing loss.

Decision: The document is noted.

R1-104083	UCI on PUSCH	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Mrs Jungah Lee from Alcatel-Lucent and makes the following recommendations:

- If there is one UL CC scheduled in a subframe, UCI is multiplexed in the PUSCH on the scheduled UL CC as in Rel-8.
- For cases when multiple UL CCs are scheduled simultaneously in a subframe, a UCI-mapping priority order of the UL CCs is pre-configured by RRC signalling: the UCI is carried on the scheduled PUSCH with the highest UCI-mapping priority.
- Concurrent transmission of PUCCH and PUSCH with UCI is not allowed in Rel-10.

Decision: The document is noted.

R1-103522	UCI on PUSCH	Ericsson. ST-Ericsson	

The document (section 2.3) was presented by Daniel Larsson from ST-Ericsson and proposes:

- If PUSCH is transmitted on the UL PCC, the UCI (A/N, aperiodic or periodic CSI) can be transmitted on PUSCH on the UL PCC.
- If PUSCH is transmitted on any UL CC but not on the UL PCC, discuss further whether to transmit UCI (A/N, periodic CSI) always on the PUCCH or on the PUSCH according to a rule. Aperiodic CSI reports can be carried on PUSCH on the UL CC indicated in the UL grant.

Decision: The document is noted.

Proposal:

- If a UE has only one PUSCH transmission in a subframe, any UCI on PUSCH is multiplexed on the PUSCH as in Rel-8.
- If the UE has a PUSCH transmission on PCC, then any UCI on PUSCH is carried on PCC

    - the choice of PUSCH in the following cases are FFS:
        - SPS
        - non-adaptive retransmissions
        - small PUSCH payloads
- In case of transmissions on multiple PUSCHs (and no PUSCH transmission on PCC): FFS (discuss further during this week)

Samsung first objected to the above statements but, as the only objecting company, further decided to go with. Therefore hereabove proposal is agreed.
Note that multiple simultaneous triggers for aperiodic CSI is considered an error case.

Friday 2nd

R1-104250	Proposal on the agreement for UCI transmission	Panasonic and co….	

The document was presented by Hidetoshi Suzuki from Panasonic.
Discussion (Question / Comment): Sourcing companies not yet finalized.
CATT don't see the reason for an exception as stated in sub-bullet "If the UE has a PUSCH transmission on PCC, then any UCI on PUSCH is carried on PCC with the exception of the case of aperiodic CSI…"
Decision: The document is noted. Mr Chairman suggested to reshuffle and correct the proposal as follows:

- PUCCH + PUSCH on same and different CCs supported as part of CA WI
    - Single UE capability assumed (inter and intra CC) and single configuration from network side unless concerns are raised by RAN4
- Control piggy-backing on PUSCH (UCI on PUSCH) supported for CA and non-CA operation
- The choice of PUSCH in the following cases are FFS:
    - aperiodic CSI
    - SPS
    - non-adaptive retransmissions
    - small PUSCH payloads
- In all other cases, if the UE has a PUSCH transmission on PCC, then any UCI on PUSCH is carried on PCC.
- In case of transmissions on one or multiple PUSCHs and no PUSCH transmission on PCC:
    - Then any UCI on PUSCH is carried on one PUSCH on SCC
- If simultaneous PUCCH + PUSCH is not configured and there is at least one PUSCH transmission, all UCI shall be piggybacked on a PUSCH
- If simultaneous PUCCH+PUSCH is configured and there is at least one PUSCH transmission
    - UCI can be transmitted on either PUCCH or PUSCH with a dependency on the situation that needs to be further discussed
    - All UCI mapped onto PUSCH in a given subframe gets mapped onto a single CC irrespective of the number of PUSCH CCs
        - Whether part of UCI gets mapped onto PUCCH and part of UCI gets mapped on to PUSCH in same or different CCs needs to be discussed

Note that the above does not imply anything about which DL CC(s) an aperiodic CSI report relates to.
Note that the number of possible triggers for aperiodic CSI and the DL CC(s) to which they relate is FFS.

R1-103522	UCI on PUSCH	Ericsson. ST-Ericsson	

The document (section 2.1 and 2.2) was presented by Daniel Larsson from ST-Ericsson and proposes the following:

- For CSI:
    - Reuse Rel-8 RM code for up to 11 bits RI
    - Reuse the Rel-8 tailbiting convolutional code for up to 15 bits RI
    - CQI/PMI is reported for each activated DL CC.
- For A/N:
    - Reuse Rel-8 scheme for up to 2 bits A/N
    - Study whether Rel-8 RM code can be reused for larger number of A/N bits.

Decision: The document is noted.

Mr Chairman decided to skip presenting R1-103732 as the conclusions are all FFS (for saving meeting time).

R1-103732	UCI on PUSCH for carrier aggregation	LG Electronics	

Decision: The document is noted.

R1-103650	HARQ-ACK and RI Multiplexing in PUSCH for DL CA	Samsung	

The document was presented by Aris Papasakellariou from Samsung and proposes the following:

- The (32, O) block code is used to support payloads of O > 2 bits.
- For O > 2 bits, the offset β_{offset}^{PUSCH} should account for SINR gains of block coding over repetition coding.
- The UE always feeds-back the maximum number of HARQ-ACK bits as determined from the number of configured cells and the configured DL transmission mode in each configured cell.

Decision: The document is noted.

R1-103760	ACK/NACK transmission scheme on PUSCH	Panasonic	

The document was presented by Seigo Nakao from Panasonic and proposes the followings.

- TDM of carrier aggregation ACK/NACK and UL data is supported
- TDM of 10 bits (12 bits in case of explicit DTX indication) ACK/NACK and UL data is supported
- Even when UE is configured for carrier aggregation, it shall use release-8 TDM scheme of ACK/NACK and UL data, if it receives "only one DL assignment for Pcell" simultaneously with UL grant(s)
- In case of carrier aggregation assignment, study further both "joint coding" and "separate coding" of the ACK/NACK information bits for Pcell and those for Scell(s).

Decision: The document is noted.

Based on the above 3 contributions, conclusion can be drawn as follows:

Agreements for coding of UCI transmitted on PUSCH:

- For up to 2 bits A/N (at least for single DL CC), reuse Rel-8 coding scheme
- For 3-11 (if needed) bits RI and A/N, reuse Rel-8 RM PUSCH UCI block code
  - If it is decided to be necessary to transmit more than 11 bits RI, code and number of bits at which the code switches is FFS
  - Note: exact max number of RI bits to be supported is FFS.

Discuss further the FFS points.

Not treated.

R1-103541	UCI transmission for CA	Qualcomm Incorporated	
R1-103761	Aperiodic CQI for Carrier Aggregation	Panasonic	Resubmission of 2868

6.2.8 Other

Not treated.

R1-103520	Timing alignment for CA	Ericsson. ST-Ericsson	
R1-103651	Simultaneous PUSCH and PUCCH Transmissions	Samsung	
R1-103652	Aperiodic CQI activation in CA	Samsung	
R1-104044	Aperiodic CQI reporting for multiple DL component carriers	Fujitsu	

6.3 Enhanced Downlink Multiple Antenna Transmission

R1-104239	DL RS Chairman's notes	Ad Hoc chairman (NTT DoCoMo)	

The document was presented by Tetsushi Abe from NTT DoCoMo.
Decision: The document is endorsed and reported as follows in sections 6.3.1 and 6.3.2.

6.3.1 DM RS

6.3.1.1 OCC mapping

R1-103442	DL DMRS OCC mapping	Huawei	

Decision: The document is noted.

R1-103517	OCC mapping design in LTE-A	Ericsson. ST-Ericsson	

Decision: The document is noted.

R1-103542	Details on OCC mapping for DL MIMO operation	Qualcomm Incorporated	

Decision: The document is noted.

R1-103585	OCC allocation and OCC mapping	ZTE	

Decision: The document is noted.

R1-103628	A further consideration for OCC Mapping	ITRI	

Decision: The document is noted.

R1-104208	Discussion on DMRS OCC-4 Mapping	Samsung	(R1-103653)

Decision: The document is noted.

R1-104201	OCC mapping for DM-RS rank 5~8	Panasonic	(R1-103762)

Decision: The document is noted.

R1-104028	Design Criteria for Length-4 OCC Mapping	NTT DOCOMO, CATT	

Decision: The document is noted.

R1-104045	DM-RS OCC design for Rank 5-8 in LTE-Advanced	Fujitsu	

Decision: The document is noted.

R1-104207	WF on DM RS OCC Mapping	AT&T, Broadcom, CeWit, CHTTL, ETRI, HTC, HT `mMobile, I2R, III, LG Electronics, MediaTek, Motorola, Pantech, Samsung	

Decision: The document is noted.

R1-104162	Way forward on length-4 OCC mapping for DL DM RS	Ericsson, ST-Ericsson, CATT, Mitsubishi, Nokia, Nokia Siemens Networks, NTT DOCOMO, Panasonic, Qualcomm, SHARP, ZTE	

Decision: The document is noted.

Conclusion:
The following design criteria should be prioritized for length-4 OCC mapping scheme of downlink DMRS

- Backward compatibility to agreed length 2 OCC mapping scheme in Rel-9
- Alphabet
  - Alt1: BPSK before scrambling
    - Docomo, ZTE, Panasonic, Nokia/NSN, Ericsson, ST- Ericsson, Mitsubishi, Fujitsu, Qualcomm, I2R, CATT, SHARP, NEC, ITRI,
  - Alt2: 6 PSK

- Samsung, LGE, Broadcom, CHTTL, ETRI, HTC, HT `mMobile, III, MediaTek, Motorola, Pantech

WF: Companies supporting each alternative are suggested to bring concrete proposal to compare against each other: Revisit on Friday.

Friday 2nd

R1-104254	Way forward on DL DMRS OCC mapping in Rel-10	CATT, Ericsson, ST-Ericsson, I2R, Mitsubishi, NEC, Nokia, Nokia Siemens Networks, NTT DOCOMO, Panasonic, Potevio, Qualcomm, Sharp, Sony, Vodafone	

The document was presented by Kazuaki Takeda from NTT DoCoMo.
Also supported by Deutsche Telekom
Decision: The document is noted.

R1-104255	Way forward on DL DMRS OCC mapping	AT&T, Broadcom, CHTTL, ETRI, HTC, HT mMobile, III, LG Electronics, MediaTek, Pantech, Research In Motion, Samsung	(R1-104207)

The document was presented by … from Samsung.
Decision: The document is noted.
Mr Chairman suggested to let each interested companies evaluate those two proposals and decide by next meeting

6.3.1.2 DM RS pattern for extended CP

R1-103443	DMRS pattern for extended CP	Huawei	

Decision: The document is noted.

R1-103482	Further investigation on DMRS design for extended CP	CATT	

Decision: The document is noted.

R1-103518	Discussion on DM-RS pattern for extended CP	Ericsson. ST-Ericsson	

Decision: The document is noted.

R1-103543	UE-RS patterns for rank 1-4 and extended CP	Qualcomm Incorporated	

Decision: The document is noted.

R1-103586	DMRS design under extended-CP	ZTE	

Decision: The document is noted.

R1-103654	DM RS for extended CP	Samsung	

Decision: The document is noted.

R1-103798	DM-RS views on extended CP	Nokia. Nokia Siemens Networks	

Decision: The document is noted.

R1-103928	Extended CP DM-RS Pattern	Motorola	

Decision: The document is noted.

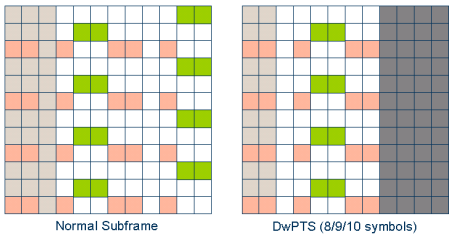
R1-103965	Remaining Issues on DM-RS Pattern for Extended CP	LG Electronics	

Decision: The document is noted.

R1-104177	Way forward on DM-RS pattern for extended CP	CMCC, Ericsson, LG Electronics, NEC, Nokia, Nokia Siemens Networks, NTT DoCoMo, ST-Ericsson, Texas Instruments, ZTE	

Decision: The document is noted.

Conclusion: Following DMRS pattern is baseline:

- The following DM-RS patterns are adopted for rank 1-2
  - Staggered structure is used in normal subframe
  - Punctured version is used in DwPTS
  - 

- Rank 3-8 transmission not supported in Rel-10 for both normal subframe and DwPTS
  - It is not precluded in later release

6.3.1.3 Other

Not treated.

R1-103544	Remaining aspects of PRB bundling	Qualcomm Incorporated	
R1-103695	Remaining details on PRB bundling size	Texas Instruments	
R1-103829	Remaining issues of PRB bundling	NEC Group	
R1-103891	Remaining issues for DMRS bundling	Huawei	
R1-103966	Remaining Details on PRB bundling	LG Electronics	
R1-104084	Explicitly configured PRB bundling	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-104210	Way Forward on DM-RS PRB Bundling configuration	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CHTTL, Huawei, HT mMobile, III, ITRI, Marvell, Motorola, Panasonic, RIM	

6.3.2 CSI RS

6.3.2.1 Intra-cell CSI-RS

Patterns

R1-103444	Email Discussion on CSI-RS pattern	Huawei	

The document was presented by Xia Yuan from Huawei and provides the outcomes of email discussion [61-02-LTE-A].
Decision: The document is noted.

Terminologies

- Base pattern:
  - CSI-RS base unit with a unique time/frequency/code structure
- Single pattern for N CSI-RS ports:
  - A single arrangement of N REs based on one/multiple base pattern(s) and the time/frequency shifts of the base pattern(s)
  - The single arrangement of N REs can be shifted in frequency/time domain for different cells
- Multiple patterns
  - At least 2 single patterns

Observation:
Legacy UE performance difference between CDM-T with 1RE overlapping with port-5 and CDM-F with no overlapping with port-5 is not significant compared with the degradation due to CSI-RS insertion.

Avoidance of antenna port 5:
Option 1: There should be at least one CSI-RS pattern not colliding with port-5
Huawei, CATT, Intel , Motorola, Qualcomm, Alcatel Lucent, Alcatel Lucent Shanghai Bell, HTC, CMCC, Potevio, ZTE

Option2: There should be at least one CSI-RS pattern with maximum 1 RE collision with port-5.
Pantech, Nokia, Nokia Siemens Networks, NTT DOCOMO, LG, ZTE, Ericsson, ST-Ericsson, NEC, Mitsubishi, TI, Sharp, MediaTek, Fujitsu, Samsung, Panasonic, LG-Nortel, ETRI, ITRI

Continue offline discussion until Friday
Friday 2nd

R1-104263	Harmonized proposal for CSI RS pattern	LG Electronics, NTT DoCoMo, CMCC, Qualcomm Inc., Ericsson, ST-Ericsson, Texas Instruments, Nokia, Nokia Siemens Networks, Motorola, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATR, CATT, CHTTL, Huawei, HTC, HT mMobile, MediaTek, Potevio, III, ITRI, ZTE, Sharp, NEC, Mitsubishi, Hitachi	

The document was presented by … from LGE.
Discussion (Question / Comment): Samsung would prefer common design solutions for both FDD and TDD and have concerns with the optionality for FS1.
Decision: The document is noted and the patterns in R1-104263 are agreed, assuming:

- Figures 1 and 2 apply to FS2 only
- Patterns on slide 4 apply to both FS1 and FS2

R1-104204	CSI RS pattern design	Huawei	(R1-103445)

Decision: The document is noted.

R1-104116	Further Considerations on CSI-RS Pattern Design	CMCC	

Decision: The document is noted.

R1-103545	CSI-RS for LTE-Advanced	Qualcomm Incorporated	

Decision: The document is noted.

R1-103799	Intra-cell CSI-RS design	Nokia. Nokia Siemens Networks	

Decision: The document is noted.

R1-103967	Intra-cell CSI-RS Pattern Design	LG Electronics	

Decision: The document is noted.

R1-104199	Intra-cell CSI-RS Design	NTT DOCOMO	(R1-104024)

Decision: The document is noted.

Interference estimation

R1-103802	Achievable CQI measurement accuracy over CSI-RS	Nokia. Nokia Siemens Networks	(R1-102955)

Decision: The document is noted.

R1-103843	Views on Muting	Ericsson. ST-Ericsson	

Decision: The document is noted.

R1-103545	CSI-RS for LTE-Advanced	Qualcomm Incorporated	

Decision: The document (section 7) is noted.

R1-103940	Muting, Interference estimation and reuse factors for CSI-RS	Motorola	

Decision: The document (section 2) is noted.

R1-103446	Evaluation on muting benefit for CSI RS design	Huawei	

Decision: The document (section 2.2.1) is noted.

Conclusion:
- Current RAN1 simulation assumption for interference estimation is to use CRS
- Further study is needed to verify the need of introducing new standard support for interference estimation.

Not treated.

R1-103483	Remaining issues on CSIRS design	CATT	
R1-103588	CSI-RS Pattern Design in Normal-CP Subframe	ZTE	
R1-103589	CSI-RS Pattern Design in Extended-CP Subframe	ZTE	
R1-103613	CSI-RS pattern design in LTE-Advanced	Pantech	
R1-103655	Discussions on CSI-RS design	Samsung	
R1-103696	CSI-RS patterns for LTE-Advanced	Texas Instruments	
R1-103763	Views on Intra-cell CSI-RS pattern	Panasonic	
R1-103842	Considerations on CSI RS	Ericsson. ST-Ericsson	
R1-103865	Proposal on CSI-RS pattern	Intel Corporation (UK) Ltd	
R1-103918	CSI-RS Pattern Design	Motorola	
R1-103943	Intra-cell CSI-RS pattern proposal	Motorola	
R1-104085	Comparison of CSI-RS patterns	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-104205	Joint Proposal on CSI-RS Patterns with CDM-F OCC=2	Huawei, CMCC, Intel, ITRI, CHTTL	
R1-104212	Way forward on CSI-RS patterns	Qualcomm, CMCC, ZTE, Potevio, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Huawei	

6.3.2.2 Muting

R1-104027	Summary of email discussion on PDSCH muting	NTT DOCOMO	

The document was presented by Tetsushi Abe from NTT DoCoMo and provides the outcomes of email discussion [61-03-LTE-A].
Decision: The document is noted.

Observation of the results of the legacy impact of PDSCH muting
- There is a performance impact due to muting for case 1 and case 2.
- Especially, when PDSCH muting is applied in other subframes than the ones transmitting CSI-RS of the serving cell, performance degradation of Rel-8/9 UE becomes more significant.
- Thus, in terms of legacy impact, it is preferable that PDSCH muting (if supported) is limited to the same subframe as the ones transmitting CSI-RS on the condition that sufficient reuse factor providing the muting gain can be obtained.

Observation of the results of the step-1 evaluation.
- MSE performance improvement is achieved by CSI-RS with PDSCH muting compared with CSI-RS without muting and CRS in channel estimation of neighboring cells.
- Throughput performance should be evaluated to further clarify the benefit of muting

Step 1 and legacy impact:

R1-103697	PDSCH muting for inter-cell CSI estimation: Rel-8 UE performance	Texas Instruments	
R1-103698	PDSCH muting: N-MSE for inter-cell CSI estimation	Texas Instruments	
R1-103764	Link level analysis on RE muting for CSI-RS design: Step1 evaluation	Panasonic	Resubmission of 2871
R1-103800	Stage 1 simulation study of RE muting for inter-cell CSI-RS	Nokia. Nokia Siemens Networks	(R1-102957)
R1-103980	Evaluation results of PDSCH muting for CSI RS design	CATR	
R1-104025	MSE Performance Evaluation of RE Muting for Inter-cell CSI-RS	NTT DOCOMO	

Step 2:

R1-103446	Evaluation on muting benefit for CSI RS design	Huawei	

Decision: The document is noted.

R1-103587	Investigation on CSI-RS muting	ZTE	

Decision: The document is noted.

R1-103657	Discussion on the overhead of muting	Samsung	

Decision: The document is noted.

R1-104202	Study on efficient power usage of muted off REs for CSI-RS	Samsung	(R1-103658)

Decision: The document is noted.

R1-103733	Muting aspects and Intercell CSI-RS design	LG Electronics	

Decision: The document is noted.

R1-103765	Link level analysis on RE muting for CSI-RS design: Step2 evaluation	Panasonic	Resubmission of 3382

Decision: The document is noted.

R1-103801	Stage 2 simulation study of RE muting for inter-cell CSI-RS	Nokia. Nokia Siemens Networks	

Decision: The document is noted.

R1-104026	Throughput Performance Evaluation of RE Muting for Inter-cell CSI-RS	NTT DOCOMO	

Decision: The document is noted.

Observation based on the presented contributions:

- Throughput performance of CoMP UE is improved by CSI RS with PDSCH muting compared with CSI-RS without muting and CRS.
- PDSCH muting is beneficial for CoMP schemes that require inter-cell channel measurements in future release.
- It is noted that introduction of PDSCH muting in future release (>Rel-10) would cause negative impact to Rel-10 UE

Possible specification impact of muting for Rel-10

- Rate matching around muted RE
- Following signaling support (implicit or explicit) to UE:
  - Enabling/disabling of muting
  - Muted RE location (offsets and duty cycle), where more study will be needed on
    - Signaling formats
    - Reduction of muting patterns
- Power usage of muted RE

WF for the next meeting

- Each company is suggested to study further if PDSCH muting can be supported in Rel-10. If yes, how to support muting should be proposed considering the specification impacts.

6.3.2.3 Other

Not treated.

R1-103659	Study on periodic feedback of PMI/CQI responding to CSI-RS	Samsung	

6.3.3 DL Single-Cell MU-MIMO

6.3.3.1 Transparent vs. non-transparent MU-MIMO

R1-103476	Control signaling for DL MIMO	CATT	
R1-103546	Signaling requirements for transparent MU-MIMO operation	Qualcomm Incorporated	
R1-103590	Analysis of PDCCH capacity in support of MU-MIMO	ZTE	
R1-103591	Considerations on downlink control signalling design for MU-MIMO transparency	ZTE	
R1-103614	DMRS Indicator of DL signalling for Non-transparent MU-MIMO	Pantech	
R1-103660	Discussions on DL control signalling for LTE-A MU-MIMO	Samsung	
R1-103661	Discussion on PDCCH capacity considering MU-MIMO	Samsung	
R1-103662	Compact DCI Design for MU-MIMO	Samsung	
R1-103699	On MU-MIMO transparency in Rel-10	Texas Instruments	
R1-103841	On DMRS Dimensioning for DL MU-MIMO	Ericsson. ST-Ericsson	
R1-103942	Transparent MU-MIMO operation for Rel-10	Motorola	
R1-103968	Discussion on MU-MIMO Transparency in LTE-A	LG Electronics	
R1-104020	Transparent/Non-transparent MU-MIMO in LTE-Advanced	NTT DOCOMO	
R1-104021	Control Signaling to Support for Enhanced DL MIMO	NTT DOCOMO	

R1-104086	DCI formats for MU-MIMO	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

6.3.3.2 Use of DM RS ports / scrambling sequences for MU-MIMO

R1-104178	Summary of email discussion on way forward for Rel-10 MU-MIMO	Huawei	

The document was presented by Yunzhe Hou from Huawei and provides the outcomes of email thread under [61-04-LTE-A]. Rapporteur's proposal is:

- Alternative 1 (4 orthogonal DM RS ports and 1 scrambling sequence) should further assume 12 RE (OCC length 4)
- And both alternatives should be further evaluated

Discussion (Question / Comment): CATT indicated that there is no performance benefit with 12 REs either.
RIM also supports 12 REs.
Decision: The document is noted.

R1-104206	Way Forward on Rel-10 DL MU MIMO	Broadcom, CATT, CATR, CEWiT, CHTTL, CMCC, Ericsson, ST-Ericsson, Fujitsu, HTC, HT mMobile, ITRI, LG Electronics, MediaTek, NewPostCom, Nokia, Nokia Siemens Networks, NTT DOCOMO, Panasonic, Samsung, Texas Instruments, Vodafone	

The document was presented by Rakesh Tamrakar from CATT and proposes:

- Only Alt2 (2 orthogonal DM RS ports and 2 scrambling sequences are defined as in Rel-9) is supported
- Only transparent MU-MIMO is supported

Discussion (Question / Comment): Huawei do not support it due to companies's views as expressed in R1-104178.
NEC questioned the exact meaning of "Only transparent MU-MIMO": No DL signalling to indicate to a UE whether a DL transmission to another UE is taking place.
Qualcomm do not see how better performance can be achieved with such proposal but agree to follow the majority.
Decision: The document is noted.

Prior to any conclusion, Mr Chairman decided looking at:

R1-103592	Performance study of MU-MIMO with quasi-orthogonal DMRS and orthogonal DMRS	ZTE	

The document was presented by Shupeng Li from ZTE and deals with MU performance with quasi-orthogonal DMRS by means of the scrambling sequence. Both quasi-orthogonal DMRS and orthogonal DMRS have its pros and cons and should be adopted and configurable in Rel-10 to give better flexibility for eNB to choose which form of DMRS is used according to channel scenarios.
Decision: The document is noted.

R1-103803	On the downlink DM-RS support for MU-MIMO in LTE Rel-10	Nokia, Nokia Siemens Networks	(R1-102958)

The document was presented by Timo Roman from Nokia and shows simulation results with neither a use case nor evidence of significant gains to be expected from MU-MIMO over four DM-RS ports within LTE Rel-10 timeframe compared to Rel-9 baseline.
Decision: The document is noted.

Conclusion (below statements in bold are agreed):

- **2 orthogonal DM RS ports and 2 scrambling sequences are supported in Rel-10**
- Is 4 orthogonal DM RS ports also supported?
  - Yes: ZTE, RIM, Pantech, Qualcomm
  - No: Broadcom, CATT, CATR, CEWiT, CHTTL, CMCC, Ericsson, ST-Ericsson, Fujitsu, HTC, HT mMobile, ITRI, LG Electronics, MediaTek, NewPostCom, Nokia, Nokia Siemens Networks, NTT DOCOMO, Panasonic, Samsung, Texas Instruments, Vodafone, NEC

Based on the number of supporting companies, it is concluded that:

- **4 orthogonal DM RS ports is not supported for MU-MIMO in Rel-10**

Furthermore, the following is agreed:

- No dynamic downlink signalling is provided to indicate to a UE whether a downlink transmission to another UE is taking place in the same RB as the one in which the UE is scheduled

Not treated.

R1-103477	Discussion on the use of DMRS ports/ scrambling sequences	CATT	
R1-103547	DM-RS assignment for MU-MIMO	Qualcomm Incorporated	
R1-103593	Considerations on downlink control signalling design for DMRS port indication with different MU dimensions	ZTE	
R1-103700	On DMRS dimensioning of MU-MIMO in Rel-10	Texas Instruments	
R1-103766	DMRS port indication with MU-MIMO considerations	Panasonic	Resubmission of 2874
R1-103830	Views on the use of DM RS ports / scrambling sequences for MU-MIMO	NEC Group	
R1-103892	DMRS for MU MIMO	Huawei	
R1-103929	Orthgonal DM-RS Ports and length-4 OCC Design for Transparent MU-MIMO	Motorola	
R1-103941	Results on DM RS port allocation for MU-MIMO	Motorola	
R1-103969	DM-RS Support for Downlink MU-MIMO in Rel-10	LG Electronics	
R1-104022	DMRS Configuration for DL MU-MIMO in LTE-Advanced	NTT DOCOMO	
R1-104056	Support of DM RS Ports and Its Signaling for LTE-A MU-MIMO	Research In Motion UK Limited	
R1-104115	DMRS indication in DL enhanced Multiple antenna transmission	CMCC	

6.3.4 Feedback design & Codebook

R1-104184	Rationale for mandating simulation of 4Tx Widely-Spaced Antenna Configuration for LTE-A MU-MIMO	AT&T	(R1-104123)

The document was presented by Sharat Chander from AT&T and justifies the reason simulating 4Tx MU-MIMO with the widely spaced cross-polarized antenna configuration. The paper also provides system simulation results pertaining to the performance of MU-MIMO in both closely spaced dual cross-pol ("XX") and widely spaced dual cross-pol ("X___X") configurations, showing equal performances.
Discussion (Question / Comment): Samsung asked clarification why widely spaced will be beneficial to low frequency bands (700MHz)
Orange highlighted their interest in these scenarios. Both TI and Huawei expressed their support as well.
Decision: The document is noted. 4Tx widely spaced cross-polarized antenna configuration is added to the set of configurations to be taken into account for the MU-MIMO feedback enhancement evaluation.

Evaluations

R1-103447	Performance evaluation of adaptive codebook as enhancement of 4 tx feedback	Huawei	

The document was presented by Yang Tang from Huawei and provides an evaluation of the use of double codebook structure for 4 antenna ports eNB showing an around 20% cell average throughput gain compared to using the single codebook (i.e. keeping the Rel.8 feedback as it is). Therefore it is proposed:

- Feedback enhancements for the 4Tx codebook should be introduced in Rel-10
- The codebook for W1 or the codebook for W2 should be the Rel-8 codebook

In addition, for Rel-10 4Tx feedback it is proposed to adopt at least the double codebook structure $\mathbf{W} = \mathbf{W}_1\mathbf{W}_2$

- A codebook of Hermitian matrices is used for $\mathbf{W}_1$
- The Rel.-8 4-antenna-codebook is reused for $\mathbf{W}_2$

Decision: The document is noted.

R1-103566	Evaluation of Codebook Adaptation with 4TX and PUCCH	Marvell	

The document was presented by Adoram Erell from Marvell and shows that codebook adaptation based on covariance is an effective technique to improve CSI accuracy for periodic feedback (PUCCH), either with or without feeding back the covariance.
Decision: The document is noted.

R1-103595	Further Performance Evaluation of LTE-A DL MIMO with 2-Level codebook	ZTE	

The document was presented by Ruyue Li from ZTE and proposes a method of enhancing feedback accuracy for MU-MIMO by using 2-level codebook demonstrating the following advantages:

- Good performance under both ULA and XPOL antenna configurations. 9%-14% gain can be achieved over Rel-8 codebook.
- Low implementation complexity (including low codeword searching complexity and good backward compatibility)
- Same technique can be applied to both for 4Tx and 8Tx.
- Small feedback overhead – potentially less overhead than Rel-8
- Support dynamic switching between Rank2 SU and Rank1 MU very easily

Decision: The document is noted.

R1-103665	Performance evaluations of Rel.10 feedback enhancement for 4Tx	Samsung	

The document was presented by Bruno Clerckx from Samsung and draws the following conclusions for 4Tx:

- Rel. 10 should support feedback enhancements based on the the new feedback framework relying on W1 and W2 matrices
- In both dual-polarized and single-polarized scenarios, performance gains and feedback overhead reduction can be achieved
- With practical feedback overhead, the performance enhancements are more visible in single-polarized channels than in dual-polarized channels
- The feedback framework based on W2W1 should be supported in Rel. 10
- The PUCCH mode 2-2, consisting of the extension of mode 2-1 to enable the report of a subband matrix indicator (corresponding to W2 $\in$C2) along with a subband CQI, should be supported.

Discussion (Question / Comment): The complexity at the UE is not the only issue according to Samsung, responding to Huawei's comment.
Evaluations performed on each feedback modes aligned with Rel-8 according to Samsung, responding to Alcatel-Lucent's comment.
Decision: The document is noted.

R1-103805	Double codebook performance evaluation	Nokia, Nokia Siemens Networks	

The document was presented by Timo Roman from Nokia and proposes to:

- Adopt the block diagonal structure for W1 and way of forming the precoder as W=W1 W2.
- For ranks 1 and 2, use four beam groups each comprised of four DFT vectors which correspond to adjacent beams in angular domain.
- Discuss the optimized scenario for ranks 3 and 4:
  - If $\lambda/2$ –spaced arrays, use four beam groups each comprised of eight DFT vectors which correspond to adjacent beams in angular domain.
  - If 4λ-spaced arrays, set W1 to identity matrix and W2 as a DFT codebook.

Decision: The document is noted.

R1-103831	Results for MU-MIMO under 4 TX Evaluation Assumptions	NEC Group	

The document was presented by Boon Ng from NEC and concludes that, for MU-MIMO, the newly introduced feedback structure [WF in R1-101683] should facilitate eNB MU-MIMO operation, like CQI estimation.
Decision: The document is noted.

R1-103839	Design and Evaluation of Precoder Codebooks for CSI Feedback	Ericsson. ST-Ericsson	

The document was presented by George Jöngren from Ericsson and proposes the following:

- The inner precoder $\mathbf{W}^{(1)}$ (i.e., closest to the channel) should typically be a tall matrix so that dimension reduction is offered.
- For 8 Tx rank 1 and 2, introduce support for either GoB 1 or GoB 2 designs as described above
  - Inline with way forward on feedback refinement and supports at least 16 beams for ULA and 16 beams for cross-pole
  - GoB 1: 4 bits for wideband $\mathbf{W}^{(1)}$ and 2 and 1 bits per subband for $\mathbf{W}^{(2)}$ for rank 1 and 2, respectively
  - GoB 2: 5 bits for wideband $\mathbf{W}^{(1)}$ and 2 and 1 bits per subband for $\mathbf{W}^{(2)}$ for rank 1 and 2, respectively
- For 8 Tx rank 3 – 8
  - GoB 1 design extended as described in Section **Error! Reference source not found.** with signaling overhead figures given by Table 2

Discussion (Question / Comment): Discussion around the description of the CQI design used in.
Decision: The document is noted.

R1-103860	Evaluation of Enhanced MIMO feedbacks for LTE-A	Intel Corporation (UK) Ltd	

The document was presented by Kamran Etemad from Intel and proposes:

- A mode 2-2 over PUCCH is defined that has 2 or 3-bit subband PMI sent together with 4 bits subband CQI and L bits subband label for one BP.
- If all three antenna configurations in [R1-103376] are required for real deployment, a 3-bit differential codebook following the principle in [R1-102813] should be adopted.
- If operators are only interested in closely spaced ULA, a 2-bit differential codebook following the principle in [R1-103377] should be adopted.

Discussion (Question / Comment):
Decision: The document is noted.

R1-103939	Results on W1W2 and W2W1 feedback for 8Tx and 4Tx	Motorola	

The document was presented by Rapeepat Ratasuk from Motorola and concludes:
1. The structure W1W2 can potentially provide better performance in XP scenarios. Further optimization of the codebooks (not limiting to a GoB structure) may provide improved performance in uncalibrated antenna scenarios. PUCCH feedback signaling with W2 fixed can cause significant degradation in performance.
o The particular W1W2 GoB design [6](Ericsson) proposal is significantly worse than IEEE802.16m D5 specifications [8] for 4Tx ULA configuration and does not enhance MU-MIMO performance.
2. The structure W2W1 [7](Samsung) provides robust performance in uncalibrated antenna scenarios and a significant advantage over W1W2 for the case of 4Tx ULA with MU-MIMO.
3. The choice of structure between W1W2 and W2W1 depends on the prioritization of use cases, specifically prioritization between XP and ULA antenna configurations and between 4Tx and 8Tx port configurations.
4. Irrespective of the choice between W1W2 and W2W1, the applicability of the double codebook structure to ranks higher than 2 need further investigation.

Discussion (Question / Comment):
Decision: The document is noted.

R1-103946	Performance evaluation of two-matrix based feedback for 4 Tx	InterDigital Communications, LLC	

The document was presented by … from InterDigital and observe the following:
• Even with realistic CSI-RS and DM-RS channel estimation error and feedback channel error, two-matrix based codebook construction methods and associated feedback schemes, such as adpative codebook, GOB and Kronecker, can still provide reasonably good performance gains over Release-8 feedback for MU-MIMO operation.
• Performance gains of antennas with low angle spread are larger than those of antennas with high angle spread.
• No single codebook construction method and associated feedback is a clear winner in all antenna configutations: Adaptive codebook provides better performance for ULA antenna configuration, while GOB and Kronecker provide better performance for XPOL antenna configuration.

• For XPOL antenna configuration, GOB offers an interesting trade-off between feedback overhead and performance: it has the second-best performance but significantly lower feedback ovehead.
Discussion (Question / Comment):
Decision: The document is noted.

R1-103952	Codebook system evaluations	Qualcomm Incorporated	

The document was presented by … from Qualcomm and proposes an updated 8x8 codebook design that achieves performance gains in the order of 1-4% compared to other proposals. Further enhancements of the proposed codebook are ongoing and may lead to additional performance enhancements.
Decision: The document is noted.

R1-104198	Performance evaluations of two-stage feedback proposals	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	(R1-104087)

The document was presented by Hongwei Yang from Alcatel-Lucent Shanghai Bell and evaluates the major feedback approaches discussed in previous RAN1 meetings. Simulation results show for co-polarized and cross-polarized antennas, approach 2 (aligned with the agreed two-stage codebook structure, where $\mathbf{W}_1$ is a $M \times M$ channel correlation matrix and $\mathbf{W}_2$ is a $M \times 1$ vector) based on spatial correlation feedback is robust to spatially correlated channels.
Decision: The document is noted.

As feedback will be discussed again in Friday morning session, Mr Chairman encouraged companies to make a good use of the different contributions for further progress.

General development of feedback framework

R1-103481	Disscussions on dual-codebook feedback framework	CATT	

The document was presented by Rakesh Tamrakar from CATT and proposes a dual-codebook structure named as EGOB. The overall precoder of rank *r* for a subband constructed by EGOB is given as

$$\mathbf{W} = \mathbf{W}_1\mathbf{W}_2 = \frac{1}{\sqrt{r}}\begin{bmatrix} \text{diag}(\mathbf{v}) & \mathbf{0} \\ \mathbf{0} & \text{diag}(\mathbf{v}) \end{bmatrix}\mathbf{M}$$

where
- The overall precoder $\mathbf{W}$ is an $N_T \times r$ unitary precoding matrix
- $\mathbf{W}_1$ targeting wideband/long-term channel properties is a square diagonal $N_T \times N_T$ matrix
- $\mathbf{W}_2$ targeting frequency-selective/short-term channel properties is a tall $N_T \times r$ unitary matrix
- $\mathbf{W}_1 = \begin{bmatrix} \text{diag}(\mathbf{v}) & \mathbf{0} \\ \mathbf{0} & \text{diag}(\mathbf{v}) \end{bmatrix}$, and $\mathbf{v}$ is an $N_T/2 \times 1$ DFT vector corresponding to the principal channel direction
- $\mathbf{W}_2 = 1/\sqrt{r} \times \mathbf{M}$, and $\mathbf{M}$ is an $N_T \times r$ unitary matrix, which contains the refined information of channel properties, such as the channel properties between two ULA groups, and the difference between the overall precoder and $\mathbf{W}_1$

Discussion (Question / Comment): Samsung commented a limited number of solution to build W1 as a drawback of the proposal.
Decision: The document is noted.

R1-103449	Double codebook based Differential feedback for MU-MIMO enhancement	Huawei	

The document was presented by Philippe Sartori from Huawei and proposes that:
- feedback enhancements for the 4Tx codebook should be introduced in Rel-10
- the codebook for W_1 or the codebook for W_2 should be the Rel-8 codebook
- some of the bits of W_1 may be reported with RI

In addition, for Rel-10 4Tx feedback it is proposed to adopt at least the double codebook based differential feedback
- the precoding matrix recommended by the UE is W = W2W1
- W1 is wideband, from the Rel-8 4Tx codebook
- W2 is subband, a diagonal matrix from the codebook shown in conlusion.

Decision: The document is noted.

R1-103664	A feedback framework based on W2W1 for Rel. 10	Samsung	

The document was presented by Bruno Clerckx from Samsung and proposes the precoder **W** for a subband to be build as

$W=W_2 W_1$ where

- The recommended precoder **W** is a N_t x R unitary precoding matrix
- The outer matrix $\mathbf{W}_1 \in C_1$ is a tall N_t x R unitary precoding matrix
  - For 4Tx, C_1 is Rel. 8 4Tx codebook
  - For 8Tx, C_1 is designed following the same principles as Rel. 8 4Tx codebook, i.e. nested property, PSK alphabet, constant modulus. It can be motivated by the following structure
    - Rank 1: $\mathbf{W}_1 = \frac{\sqrt{2}}{2}\begin{bmatrix} \mathbf{A} \\ e^{j\phi}\mathbf{A} \end{bmatrix}$
    - Rank 2: $\mathbf{W}_1 = \frac{1}{2}\begin{bmatrix} \mathbf{A} & \mathbf{A} \\ e^{j\phi}\mathbf{A} & -e^{j\phi}\mathbf{A} \end{bmatrix}$ with **A** a DFT vector
- The inner matrix $\mathbf{W}_2 \in C_2$ is a square unitary N_t x N_t diagonal matrix
  - For 4Tx, $\mathbf{W}_2 \in C_2$ has the following structure

$$\Theta = \begin{bmatrix} 1 & & & \\ & e^{j\pi\theta} & & \\ & & e^{j2\pi\theta} & \\ & & & e^{j3\pi\theta} \end{bmatrix}$$

  - For 8Tx, $\mathbf{W}_2 \in C_2$ has the following structure

$$\Psi = \begin{bmatrix} \sqrt{2-|\alpha|^2}\Theta & 0_{4x4} \\ 0_{4x4} & \alpha\Theta \end{bmatrix}$$ with α a complex scalar with $|\alpha| = 1$

Decision: The document is noted.

R1-103804	Double codebook design principles	Nokia, Nokia Siemens Networks	

The document was presented by Timo Roman from Nokia and proposes the following:

- Precoder **W** is formed as a matrix product $\mathbf{W=W_1W_2}$.
- For ranks 1-2:
  - $\mathbf{W_1}$ is block-diagonal. Each block matrix in $\mathbf{W_1}$ comprises N_b DFT vectors which correspond to adjacent beams in angular domain.
    - For ranks 1-2, $N_b=4$.
  - Each $\mathbf{W_2}$ codeword comprises column (beam) selection and co-phasing.
- For ranks 3-8:
  - $\mathbf{W_1}$ is the identity matrix and $\mathbf{W_2}$ consists of a small number of matrices per rank (e.g. one to four per rank).
  - $\mathbf{W_2}$ is based on a DFT codebook.

Decision: The document is noted.

R1-103840	CSI Feedback Signaling	Ericsson. ST-Ericsson	

The document was presented by George Jöngren from Ericsson and proposes the following:

- The extensions in Rel-10 of the wideband reports in Rel-8 (PUSCH 3-1, PUCCH 1-1) are still wideband
  - A single $\mathbf{W}^{(1)}$ and a single $\mathbf{W}^{(2)}$ is reported for the entire bandwidth
- Perform subsampling of the codebook(s) on PUCCH for maintaining the coverage of CSI on PUCCH which anyway can only support coarse reports
- Report self-contained with $\mathbf{W}^{(1)}$ and $\mathbf{W}^{(2)}$ in the same subframe for extending all PUSCH based reporting modes
- For PUCCH possible to report $\mathbf{W}^{(1)}$ and $\mathbf{W}^{(2)}$ in the same subframe using subsampling of codebooks to maintain control signaling coverage
  - PUCCH 1-1 is simple in Rel-8 and should be kept simple in Rel-10 as well
    - Report self-contained with $\mathbf{W}^{(1)}$ and $\mathbf{W}^{(2)}$ in the same subframe and codebooks spatially subsampled to fit within present payload sizes (corresponding to CSI mode 2 in R1-103419)
- Reporting $\mathbf{W}^{(1)}$ and $\mathbf{W}^{(2)}$ in different subframes only considered for PUCCH 2-1 which anyway already departs from self contained principle
- Independent configuration of periodic PUCCH CSI reporting for each carrier

- Implements cycling over carriers

Decision: The document is noted.

R1-104134	Two-component Feedback Design and Codebooks	Motorola	(R1-103917)

The document was presented by … from Motorola and proposes to:

- Construct the subband precoder as W1W2 with W2 capturing the subband component for the cross-pol sub-stucture and W1 capturing the wideband component for ULA sub-structure
  - W1 is a diagonal matrix of dimension Nt X 2r, where Nt is the number of transmit antennas and r is the rank of transmission.
  - W2 is a diagonal matrix of dimension 2r X r for rank 2
  - W1 = $\begin{bmatrix} v_1 & v_2 & 0 & 0 \\ 0 & 0 & v_1 & v_2 \end{bmatrix}$ for rank 2
  - [v1, v2] is from DFT based codebook. v1,v2 is based on 3 or 4 bit DFT
  - Further details on W2 2r X r matrix can be found in the contribution
- Construct the subband precoder as W2W1 with W1 still capturing the wideband component for ULA sub-structure, but W2 capturing the subband component of both the cross-pol and ULA sub-structure
  - W1 is a diagonal matrix of size r.Nt X r, where Nt is the number of transmit antennas and r is the rank of transmission.
  - W2 is a Nt X r.Nt matrix
  - W1 = $\begin{bmatrix} v_1 & v_2 & 0 & 0 \\ 0 & 0 & v_1 & v_2 \end{bmatrix}$ for rank 2
  - [v1, v2] is from DFT based codebook. v1,v2 is based on 3 or 4 bit DFT
  - Ex: W2 = $\begin{bmatrix} a_{11}D & . & . & a_{14}D \\ a_{21}D & . & . & a_{24}D \end{bmatrix}$, $D = diag(u)$, u=rotation vector to adjust/up-sample wideband ULA component.

Decision: The document is noted.

R1-104088	Discussion of two-stage feedback proposals	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	

The document was presented by Hongwei Yang from Alcatel-Lucent Shanghai Bell and deals with $\mathbf{W}_1$ feedback periodicity is discussed, and it is shown that $\mathbf{W}_1$ feedback should be sent only when necessary. It is proposed that the two-stage feedback approach with square $\mathbf{W}_1$ be adopted for Rel-10.

Decision: The document is noted.

R1-104195	On the importance of successive feedback refinement for cross-polarized antenna configurations	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Intel, Philips	(R1-104136)

The document was presented by Federico Boccardi from Alcatel-Lucent and propose:

- In order to improve the performance, the CSI feedback should be designed in order to exploit time and/or frequency correlation via successive feedback refinement.
- The different proposals for successive feedback refinement, should be evaluated taking into account robustness w.r.t. errors in the feedback channels, robustness w.r.t. channel variations and performance improvement in different antenna configuration scenarios.

Decision: The document is noted.

R1-103568	Successive Codebook Refinement: Further Evaluation	Marvell	

The document was presented by … from Marvell and introduces a method called “Successive codebook refinement” where the codebook is adapted based on the past feedback history as a feedback enhancement solution for improving CSI accuracy of PUCCH signalling. The paper concludes that RAN1 should further evaluate the use of such method.

Decision: The document is noted.

R1-104169	WF on Rel. 10 feedback for 4Tx	Samsung, ALU, ALU Shanghai Bell, Huawei, Intel, Marvell, ZTE, RIM, Pantech, Qualcomm, Fujitsu, CATT, Orange, ETRI, AT&T, NEC, Toshiba, Philips, Panasonic, Interdigital, MediaTek, Vodafone	

The document was presented by Bruno Clerckx from Samsung and proposes that in order to improve MU-MIMO performance, the feedback accuracy for 4Tx in Rel.10 is enhanced over Rel.8 by the framework defined in R1-101683, R1-103332 and R1-103419.
Discussion (Question / Comment): Ericsson commented that the WF looks very similar to the one extensively discussed on the reflector that could not reach consensus. TI agreed that the WF doesn't help too much to further progress. Mr Chairman commented that the content was somehow already agreed and suggested to move ahead and try to agree the details of feedback design.
Decision: The document is noted and the WF is not agreed.

Conclusion:

- It is noted that the cosigning companies of R1-104169 have agreed that there are significant gains for enhanced feedback schemes that are based on the cited WFs.
- It is noted that the cited WFs are already agreed including the case of 4Tx and the focus will be on making the way forward more concrete for 4Tx.
- It is also noted that 4Tx is the priority.

Friday 2nd

R1-104241	Way Forward on Rel. 10 4Tx feedback framework	Samsung, Huawei, ALU, Alcatel-Lucent Shanghai Bell, Pantech, NEC, Intel, ZTE, Fujitsu, ETRI, Marvell, InterDigital, MediaTek	

The document was presented by Bruno Clerckx from Samsung.
Discussion (Question / Comment): CMCC also cosourced the proposed WF. Motorola commented that this codebook structure needs further enhancements (refering to their contribution – the Nt x Nt matrix dimensioning seems the problem – the proposed structure might not be optimal for the cross pol cases).
Samsung agreed that design details still need to be worked out but should be understood as a step forward.
Feedback structure is more important that detailed codebook design at this stage, according to Philips (who support the WF). TI don't see how the proposal helps (wideband cases not taken into account) providing step forward.
Mr Chairman warned that the group should be prepared to accept compromises in order to help further progress.
Decision: The document is noted. Companies with alternative proposals should describe them for 4 Tx.
Consider possible update to evaluation assumptions agreed in RAN1#61 to take antenna calibration / time misalignment into account.

R1-104252	Proposal on Calibration Error Model for Evaluations	Qualcomm Incorporated	

The document was presented by Peter Gaal from Qualcomm and proposes a calibration error model to be used in the feedback evaluations for both 4Tx and 8Tx scenarios.
Decision: The document is noted and Mr Chairman requested companies to draw their attention to that proposal.

Uplink control signalling aspects

R1-103478	Control signaling design for dual-codebook operation	CATT	

The document was presented by Rakesh Tamrakar from CATT and proposes:

- For periodic reporting using PUCCH
  - W1,CQI/W2 and RI are reported with distinct periods, offsets as well as priorities
  - In case of collision, the report with lower priority is dropped
- For aperiodic reporting using PUSCH
  - Multi-granularity feedback with wideband, UE selected and higher layer configured CQI reports can be considered in Rel-10

Discussion (Question / Comment): NSN commented that the proposed solution implies more complex PUCCH design and may significantly increase the overhead. Similar comment from Samsung.
Decision: The document is noted.

R1-103567	Covariance Compression and Transmission on PUCCH for Codebook Adaptation	Marvell	

The document was presented by Adoram Erell from Marvell and proposes a framework for covariance quantization codebook that is common to both 4Tx and 8Tx and works for both polarized and cross polarized antenna configurations. The paper concludes that a codebook of size 5 bits works well in all configurations.
Decision: The document is noted.

R1-104196	Consideration on Signaling for Two-component Feedback	ZTE	(R1-103596)

The document was presented by Ruyue Li from ZTE and proposes three options of UL PUCCH signaling to support two-component feedback. The three options inherit the framework of Rel.8.

- For Option A, RI is jointly coded with the entire W1 in one report type. W2 is jointly coded together with wideband CQI in another report type.
- For Option B, RI is jointly coded with one part of W1 in one report type. Another part of W1 is jointly coded together with W2 and wideband CQI in another report type.
- For Option C, RI is individually reported in one report type. W1 and W2 are jointly coded together with wideband CQIs with reduced the differential CQI overhead.in another report type.

For enhancement , a new report type for subband CSI contains a frequency selective CQI and a frequency selective W2 in the form of bandwidth parts.
For PUSCH, RI and PMIs should be separated even if joint coding of RI and W1 is employed in PUCCH.
Discussion (Question / Comment): NSN questioned what the preferred option was for PUCCH. ZTE: none
Decision: The document is noted.

R1-103667	Control signaling to support Rel. 10 feedback framework	Samsung	

The document was presented by Bruno Clerckx from Samsung and proposes the reporting modes for Rel. 10 UEs to be based on the following design principles:

- $\mathbf{W}_1 \in C_1$ is considered as a precoding matrix while $\mathbf{W}_2 \in C_2$ is a matrix.
- The feedback enhancement requiring the report of $\mathbf{W}_1 \in C_1$ and $\mathbf{W}_2 \in C_2$ would be applied to rank not larger than 2.
- For RI ≤ 2 , the precoding matrix $\mathbf{W}_1 \in C_1$ is reported whenever a wideband matrix indicator is required and $\mathbf{W}_2 \in C_2$ is reported whenever a wideband matrix indicator with higher accuracy is required or whenever a subband matrix indicator is required. For RI > 2, the precoding matrix is selected in C_1.
- A CQI is always computed based on the recommended precoder $\mathbf{W}$, function of $\mathbf{W}_1 \in C_1$ and $\mathbf{W}_2 \in C_2$.
- The reporting mechanism follows Rel. 8 philosophy.

Decision: The document is noted.

R1-103806	UL CSI feedback channel design & performance	Nokia Siemens Networks. Nokia	

The document was presented by Timo Lunttila from NSN and proposes:

- PUCCH format 2 is used for signalling the CSI
- $\mathbf{W_1}$ and $\mathbf{W_2}$ are signalled in separate subframes.
- $\mathbf{W_1}$ is encoded jointly with RI and thus signalled in the same subframe as RI.
- $\mathbf{W_2}$ is signalled in same subframe together with CQI(s).
- FFS if subsampling of the $\mathbf{W_1}/\mathbf{W_2}$ codebooks is needed for PUCCH reporting.

To minimize the number of options in the specification, we feel that RAN1 should carefully consider leaving CSI mode 2 unspecified.
Decision: The document is noted.

R1-103971	Consideration on Feedback Design for Rel-10	LG Electronics	

The document was presented by … from LGE and can be summarized as follows:

- It seems appropriate to define the dual-codebook properties as
  - W_1: long-term/wideband
  - W_2: short-term/subband
- The concept of Rel-8 reporting modes in PUSCH and PUCCH can be reused for Rel-8 dual-codebook reporting
  - It should be discussed that which reporting modes in Rel-8 should be prioritized for the Rel-10 feedback extension

Decision: The document is noted.

R1-104023	Further Views on CSI Feedback Signaling on PUSCH/PUCCH for LTE-Advanced	NTT DOCOMO	

The document was presented by … from NTT DoCoMo and deals with periodic and aperiodic PMI/CQI/RI reporting of a double codebook structure on the PUCCH and PUSCH in Rel-10. Following is observed:

- Reuse the Rel-8 CSI feedback framework as much as possible even for Rel-10 feedback based on a double codebook structure to reduce the burden of specification effort. More specifically, consider only modes 1-2, 2-2, and 3-1 of Rel-8/9 as extension for Rel-10 and not more for the aperiodic PUSCH reporting.
- For periodic reporting on the PUCCH, the subband size for selecting precoder W2 should be set to the system bandwidth or bandwidth of a component carrier (CC), e.g., 20 MHz, for all the PUCCH reporting mode.
- In case of rank > 2, it might make sense to fix one of W1 or W2 to reduce the feedback overhead. This is because the codebook design for rank > 2 should be targeted only for SU-MIMO with less correlated scenario, and significant performance loss would not be observed even when W1 (or W2) is fixed.

Decision: The document is noted.

R1-104046	CSI Feedback for LTE-A with double codebook structure	Fujitsu	

The document was presented by … from Fujitsu and proposes:

- In the subframes with CSI values estimated for the same BP using the same CSI-RS, one alternative is UE only feedback once in one subframe and do not feedback anything in other subframes. The other alternative is to configure other CSI values to be fed back in the subframe with same CSI values.
- W2 is preferred to be encoded with other CSI, such as its corresponding subband CQI, etc. The other option is jointly encoded W2 of all the subbands for reporting.

Decision: The document is noted.

R1-104062	On the design of two-matrix feedback framework for Rel-10	CHTTL	

The document was presented by … from CHTL and suggests for the periodic reporting on the PUCCH:

- PMI2 is reported with wideband CQI and the subband PMI2 is set to the system bandwidth
- CQI/PMI2, PMI1/RI can be sent on PUCCH in different sub-frames, where PMI1/RI can be sent in different or the same subframes.
- Some new parameter like NOFFSET,PMI1 can be added to specify the location of PMI1
- PMI1 should be robustly encoded to prevent from the long period of error propagation
- A new reporting mode for PUCCH is required which can be extended from mode 1-1/2-1 in Rel-8

For the aperiodic reporting on the PUSCH, it is suggested to report PMI1 and PMI2 in the same subframe concurrently with a UL grant indicator.

Decision: The document is noted.

R1-104090	CQI/PMI reporting modes for two-stage feedback	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Federico Boccardi from Alcatel-Lucent and concludes:

- For PUCCH reporting, modes 1-1 and 2-1 are extended.
  - The RI reports are extended by 1 bit to indicate whether the associated reporting cycle includes an update of W1 or only W2 feedback.
  - W1 is fed back in a single report on its own.
  - The CQI report corresponding to W1 is transmitted in the reporting instance immediately following the W1 report.
  - W2 and the CQI report corresponding to W2 are transmitted together in a single reporting instance.
- For PUSCH reporting, modes 1-2, 2-2 and 3-1 are extended.
  - Each report contains both W1 and W2 feedback.
- 6 bits are used for each W1 report, and 4 bits for each W2 report.

Decision: The document is noted.

R1-104120	Extending Rel.8/9 CSI Feedback Schemes for Rel.10	Texas Instruments	

The document was presented by f and proposes that Rel.8/9 aperiodic PUSCH CQI modes are extended as follows:

CQI mode	W1	W2
1-2	Single: One for the	Multiple: one per sub-band (frequency selective)

2-2	entire system BW (wideband)	Two: One for the entire system BW (wideband) + one representing all the "best-M-average" (UE-selected) sub-bands (frequency selective)
3-1		Single: One for the entire system BW (wideband)

For the Rel.8/9 periodic PUCCH CQI modes:

- Extension of frequency-selective W2 is not supported.
- Mode 1-1 and 2-1 are extended as follows:
  - W (the composite precoder) is derived from a single wideband W1 and a single wideband W2
  - *CSI mode 1* (W1 and W2 are reported in separate subframes): Propose that W1 be reported in the same subframe as RI. The overhead associated with W1+RI should be minimized via, e.g. joint encoding whenever applicable or sub-sampling of W1 if necessary.
  - *CSI mode 2* (W1 and W2 are contained in the same report): When W1 and W2 are contained in the same subframe, sub-sampling of W1, W2, or both is needed to ensure that the total payload of W1+W2 does not exceed 4 bits.

Decision: The document is noted.

Mr Chairman closed the session highlighting 3 main points

- Focus is clearly on 4Tx antenna and companies are encouraged to prioritize their efforts on it
- W.r.t the uplink control signalling, there is a need now to narrow down the number of options
- Third point vanished from Mr Chairman's mind

Friday 2nd

R1-104234	Way Forward on CSI Feedback for Rel.10 DL MIMO	Texas Instruments, LG Electronics, Nokia, Nokia Siemens Networks, NTT DoCoMo	

The document was presented by Eko Onggosanusi from TI.
Discussion (Question / Comment): Samsung commented only one company has provided simulation results on jointly encoding for CSI Mode 1 → premature to conclude from results from one company.
Decision: The document is noted.

R1-104244	Way-forward on Rel. 10 CSI Feedback signaling	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, ASUSTek, CHTTL, CMCC,ETRI, Fujitsu, HTC, Huawei, III, Intel, Marvell, MediaTek, NEC, Potevio, Samsung, ZTE	

The document was presented by Federico Boccardi from Alcatel-Lucent.
Discussion (Question / Comment): TI recommended to keep focus on commonalities between the two WF and let hot topic (CSI Mode 2-1) for further discussion.
Decision: The document is noted. Mr Chairman strongly suggested to interested companies to see over lunch whether a combined WF could be drawn for final review in the afternoon.

R1-104259	Way Forward on CSI Feedback for Rel.10 DL MIMO	Texas Instruments, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT, Ericsson, Huawei, Marvell, NEC, Nokia, Nokia Siemens Networks, NTT DoCoMo, Panasonic, Samsung, Sharp, ST-Ericsson	

The document was presented by Eko Onggosanusi from TI.
Decision: The document is noted. Companies are strongly encouraged to work together to come up with a joint way forward.

CQI/PMI derivation

R1-103615	CQI feedback for Downlink MU-MIMO	Pantech	

The document was presented by … from Pantech and proposes a new CQI feedback scheme for MU-MIMO. which indicates the average noise plus intercell interference (the interference among different layers of MIMO operation is not included). By using this feedback, the eNB can predict the post SINR for MU-MIMO mode with much higher accuracy.
Decision: The document is noted.

R1-103663	Multi-component feedback for SU/MU-MIMO dynamic switching enhancement	Samsung	

The document was presented by Bruno Clerckx from Samsung and provides inputs on what will dynamic switching of SU-MIMO and MU-MIMO may bring based on multi-component feedback (rank restricted feedback). Furthermore, it provides a technique based on best companion CQI that shows that some performance gain can be obtained by reporting some CQI that accounts for intra-cell interference.
Decision: The document is noted.

R1-103768	Discussion on aperiodic feedback of PMI/CQI responding to CSI-RS	Panasonic	

The document was presented by Seigo Nakao from Panasonic and discusses the relation between CSI-RS and aperiodic feedback especially from load balancing of PDCCH and PUSCH, for further considerations.
Decision: The document is noted.

R1-103832	MU-MIMO: CQI Computation and PMI Selection	NEC Group	

The document was presented by Boon Ng from NEC and deals with enhancements to the MU-MIMO operation which aim to reduce the mismatch between the user reported SINRs and the ones it actually observes in the aftermath of scheduling. It is observed that indicating the expected total number of streams (that the eNodeB expects to co-schedule on a sub-band) to a user can substantially reduce this mismatch and hence help realize the benefits of MU-MIMO.
Decision: The document is noted.

R1-103903	Enhanced PMI Indication for Refining MIMO Precoder Codebook	HTC	

The document was presented by … from HTC and proposes an enhanced PMI-based feedback scheme in which UEs can feed back multiple PMIs along with some auxiliary scalar coefficient(s) to allow the eNB to construct a refined precoding matrix.
Discussion (Question / Comment): Not compatible with W2 W1 framework according to Mr Chairman. Work should be focused on what RAN1 has already agreed on.
Decision: The document is noted.

Not treated.

R1-103668	Discussion on CSI-RS based CQI Reporting for Rel-10	Samsung	
R1-103479	Further investigation on 8Tx codebooks	CATT	
R1-103480	Multi-granularity codebooks for 4Tx DL MIMO	CATT	
R1-103523	Problem of dual-codebook feedback framework with RF timing misalignment	CATT	
R1-103569	Evaluation of 8TX Codebooks	Marvell	
R1-103594	Further Discussion on Two-component Feedback Framework for 8Tx	ZTE	
R1-103616	On the two stage 8 Tx codebook	Pantech	
R1-103617	Companion subset based PMI feedback for rank 1/2 MIMO transmission	Pantech	
R1-103666	Performance evaluations of Rel.10 feedback framework for 8Tx	Samsung	
R1-103701	8Tx Codebook Design	Texas Instruments	
R1-103702	Link-level simulation results for 8Tx codebook design	Texas Instruments	
R1-103703	System-level simulation results for 8Tx codebook design	Texas Instruments	

R1-103767	Further considerations on 8Tx codebook design	Panasonic	Update of 2875
R1-103866	Dual-indicator feedback for Rel-10 extension	Toshiba	
R1-103867	Further considerations on Rel-10 feedback design and codebook	Toshiba	
R1-103909	Codebook alphabet and PA power balance	Philips	
R1-103910	Analysis of polarisation aspects in rank 2 transmission	Philips	
R1-103970	Feedback Codebook Design and Performance Evaluation	LG Electronics	
R1-104047	Discussion on Feedback Design for LTE-A	Fujitsu	
R1-104052	Feedback reduction mechanism for MU-MIMO	HTC	
R1-104057	Pre-Assigned Companion Subsets for Feedback Reduction and 2-Stage Codebook Design	Research In Motion UK Limited	
R1-104058	Companion Subset Based PMI/CQI Feedback for LTE-A MU-MIMO	Research In Motion UK Limited	
R1-104089	Further evaluation of differential feedback in the context of the Rel-10 two-stage implicit feedback framework	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-104091	Further analysis of companion feedback performance and feedback signalling overhead reduction	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-104139	Multiple PMI feedback for dynamic SU/MU switching	Texas Instruments	
R1-104191	DL codebook for 8TX	Huawei	(R1-103448)
R1-104164	Way Forward on 8Tx Codebook for Rel.10 DL MIMO	Texas Instruments, Nokia, Nokia Siemens Networks, Ericsson, ST-Ericsson, NTT DoCoMo	

6.3.5 Other

Not treared.

R1-103669	TX diversity on MBSFN subframe	Samsung	
R1-103670	DL transmission modes for Rel-10	Samsung	
R1-103704	DL MIMO transmission modes in Rel-10	Texas Instruments	
R1-103911	Correction to Cross-Polar Channel Modelling in TR36.814	Philips	
R1-103972	Remaining Issues on Downlink TxD in LTE-A Subframe	LG Electronics	

6.4 UL Multiple Antenna Transmission

R1-104240	Summary of UL MIMO and UL RS Ad-hoc Session	Ad Hoc chairman (Samsung)	

The document was presented by Charlie Zhang of Samsung and provides the outcomes of the ad-hoc session.
Decision: The document is endorsed and reported as follows in sections 6.4.1 to 6.5.2.

6.4.1 Transmission modes and Signalling requirements

Not treated.

R1-103450	Uplink transmission modes	Huawei	
R1-103484	Further discussion on signaling of UL MIMO	CATT	
R1-103548	UL transmission modes for LTE-A operation	Qualcomm Incorporated	
R1-103598	PMI signalling for UL MIMO	ZTE	
R1-103599	UL Transmission Modes and Signalling requirements for LTE-A	ZTE	
R1-103671	Further Discussions on UL MIMO signaling requirements	Samsung	
R1-103672	Re-using DCI format0 for UL SU-MIMO retransmission	Samsung	
R1-103673	Further discussion on UL SU-MIMO precoding in PHICH-triggered retransmissions	Samsung	
R1-103674	PMI signaling in DCI format for UL MIMO	Samsung	
R1-103705	Remaining Issues on UL MIMO Transmission Mode and DCI Format Design	Texas Instruments	
R1-103769	Discussion on uplink transmission mode	Panasonic	
R1-103807	On UL SU-MIMO transmission modes and control signalling	Nokia Siemens Networks. Nokia	
R1-103893	Control signalling design for UL MIMO	Huawei	
R1-103930	Control Signalling for UL MIMO	Motorola	
R1-103953	UL MIMO scheme for retransmissions triggered by PHICH	Qualcomm Incorporated	
R1-103973	Discussion on Control Signaling for Uplink Transmission Mode	LG Electronics	
R1-104226	Further discussion of UL transmission modes and DCI format designs	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	(R1-104092)
R1-104229	UL grants for MIMO transmissions	Qualcomm Incorporated	(R1-103549)
R1-104230	Way forward on TB Disabling	Huawei, Texas Instruments, Nokia, Nokia Siemens Networks, Motorola, CATT, Samsung	

6.4.2 UCI multiplexing on PUSCH in case of SU-MIMO

R1-104165	Clarification for HARQ-ACK/RI Replica on PUSCH with SU-MIMO	Sharp	(R1-103721)

Decision: The document is noted.

R1-103451	Remaining issues of of Multiplexing Schemes of control and data in multi-layer PUSCH transmission	Huawei	

Decision: The document is noted.

R1-103550	Further details on UCI multiplexing for SU-MIMO transmission	Qualcomm Incorporated	

Decision: The document is noted.

R1-104167	UCI Multiplexing on PUSCH with MIMO Transmission	ZTE	(R1-103601)

Decision: The document is noted.

R1-103675	Further disucssion on Data and Control Multiplexing in UL MIMO Transmissions	Samsung	

Decision: The document is noted.

R1-103706	Remaining Issues on UCI Multiplexing for UL MIMO	Texas Instruments	

Decision: The document is noted.

R1-103722	Codeword and symbol length determination for UCI multiplexing on the PUSCH with SU-MIMO	Sharp	

Decision: The document is noted.

R1-103770	UCI multiplexing on PUSCH with MIMO transmission	Panasonic	

Decision: The document is noted.

R1-103808	UCI multiplexing on PUSCH with SU-MIMO	Nokia Siemens Networks. Nokia	

Decision: The document is noted.

R1-103844	Signaling of UCI on PUSCH	Ericsson. ST-Ericsson	

Decision: The document is noted.

R1-103845	Resource allocation for UCI on PUSCH	Ericsson. ST-Ericsson	

Decision: The document is noted.

R1-104216	UCI Multiplexing on PUSCH in UL-MIMO Transmissions	Motorola	(R1-103916)

Decision: The document is noted.

R1-103974	UCI Multiplexing for Multi-layer PUSCH Transmission	LG Electronics	

Decision: The document is noted.

R1-104163	Further discussions on UCI Multiplexing on PUSCH in case of SU-MIMO	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	(R1-104093)

Decision: The document is noted.

R1-103723	UCI Differentiation for Transmission on PUSCH with SU-MIMO	Sharp	

Decision: The document is noted.

Agreement:

HARQ and RI resource size

- Take Alt 1 as baseline assumption
  - FFS whether or not a compensation factor should be included to account for large RI/AN payload
  - FFS whether or not a rank-dependent spectrum efficiency adjustment, or spectrum efficiency cap, is needed for multi-layer case

- Number of resources per layer is given by
  - Alt 1: In case single beta value is agreed, simple extension of Rel-8

$$Q' = \min\left\{\left\lceil \frac{O \cdot M_{sc}^{PUSCH-initial} \cdot N_{symb}^{PUSCH-initial} \cdot \beta_{offset}^{PUSCH}}{\sum_{r=0}^{C^{(0)}-1} K_r^{(0)} + \sum_{r=0}^{C^{(1)}-1} K_r^{(1)}} \right\rceil, 4 \cdot M_{sc}^{PUSCH}\right\}$$

    In the case multiple beta values are agreed, the equation can be further changed to account for multiple beta value.

  - Alt2: further optimization for high-payload cases

$$Q'_{RI} = \min\left(\left\lceil \max\left(\frac{Q_{all}}{K^{(0)} + K^{(1)} + \alpha_{RI}}, \frac{1}{s_{\max}}\right) \cdot \beta_{offset}^{RI} \cdot O^{RI} \right\rceil, Q'_{\max.,RI}\right)$$

$$Q'_{HARQ-ACK} = \min\left(\left\lceil \max\left(\frac{Q_{all}}{K^{(0)} + K^{(1)} + \alpha_{HARQ-ACK}}, \frac{1}{s_{\max}}\right) \cdot \beta_{offset}^{HARQ-ACK} \cdot O^{HARQ-ACK} \right\rceil, Q'_{\max,HARQ-ACK}\right)$$

CQI/PMI resource size:

- Take Alt 1 as baseline assumption
  - FFS whether or not a compensation factor should be included to account for large RI/AN payload
- Number of resources per layer is given by
  - Alt 1: In case single beta value is agreed, simple extension of Rel-8

$$Q' = \min\left\{\left\lceil \frac{(O+L) \cdot M_{sc}^{PUSCH-initial} \cdot N_{symb}^{PUSCH-initial} \cdot \beta_{offset}^{CQI}}{\sum_{r=0}^{C^{(x)}-1} K_r^{(x)}} \right\rceil, M_{sc}^{PUSCH} \cdot N_{symb}^{PUSCH} - Q'_{RI}\right\}$$

    In the case multiple beta values are agreed, the equation can be further changed to account for multiple beta value.
  - Alt2: further optimization for high-payload cases

$$Q'_{CQI} = \min\left(\left\lceil \frac{Q_{all} - Q'_{RI}}{K^{(k_{CQI})} + \alpha_{CQI}} \cdot \beta_{offset}^{CQI} \cdot (O^{CQI} + L) \right\rceil, Q'_{\max.,CQI}\right)$$

TB choice for CQI/PMI report in the case of 2TB transmission

- Baseline assumption is that TB associated with highest MCS or TBS indicated by the UL grant
  - Can be revisited if major performance loss is identified, compared to other approaches such as lowest MCS
  - FFS whether "Ping-pong" effect is an issue? And if it's an issue, how to address it.
    - "Ping-pong" effect refers to the case when the introduction of UCI reverses the order of MCS among two TBs, if eNB decides to adjust the MCS of the TB with UCI
  - FFS the treatment of TB choice, in case MCS or TBS is the same for both TBs

Other remaining issues to be discussed next meeting:

- Need to clarify the exact interpretation of "Replica"
  - Option A) Replicate before Channel Coding
  - Option B) Replicate after Channel Coding
  - Option C) Replicate after Scrambling
- Need to clarify which modulation is used in case of 2 CW transmission
- Mapping schemes for RI and AN

6.4.3 PHICH mapping for UL SU-MIMO

R1-103551	PHICH mapping in support of UL MIMO operation	Qualcomm Incorporated	

Decision: The document is noted.

R1-104030	PHICH Resource Mapping Design for SU-MIMO	NTT DOCOMO	

Decision: The document is noted.

R1-103676	PHICH Resource Mapping for UL SU-MIMO	Samsung	

Decision: The document is noted.

R1-104129	PHICH assignment for UL SU-MIMO	ZTE	(R1-103575)

Decision: The document is noted.

R1-103707	PHICH Resource Allocation Techniques for UL SU-MIMO	Texas Instruments	

Decision: The document is noted.

Assumption:
CSI: the IE in the UL grant
CS: cyclic shift used for UL DMRS, defined for each layer
CS for all layers will be implicitly determined from the same CSI value

Agreement:
Take Alt 2 as baseline assumption.

- Alt1: The CSI value associated with the PUSCH transmission
  - The first PHICH is determined by CSI (as in Rel-8), the second is determined by replacing CSI with (CSI+ 1) in the same Rel-8 equation
- Alt2: The first PHICH is determined by Rel-8 equation, the second is determined by replacing (lowest PRB index) with (lowest PRB index+1) in the same Rel-8 equation

Not treated.

R1-103809	PHICH mapping for UL SU-MIMO	Nokia. Nokia Siemens Networks	
R1-103894	Discussion on PHICH resource allocation for UL MIMO	Huawei	
R1-103944	PHICH Mapping for UL SU-MIMO	Motorola	
R1-103975	PHICH Resource Assignment for UL SU-MIMO	LG Electronics	
R1-104094	Further discussions on PHICH mapping for UL SU-MIMO	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	

6.4.4 PUCCH TxD transmission scheme

Not treated.

R1-103452	Transmit diversity for PUCCH format 2/2a/2b	Huawei	
R1-103552	Transmit diversity for PUCCH format 2	Qualcomm Incorporated	
R1-103602	Multi-antenna transmission scheme for PUCCH format 2	ZTE	
R1-103677	Transmit Diversity for PUCCH Formats 2/2a/2b	Samsung	
R1-103724	PUCCH TxD for Formats 2/2a/2b for LTE-Advanced	Sharp	(R1-103207)
R1-103810	On transmission diversity for PUCCH Format 2/2a/2b	Nokia Siemens Networks. Nokia	
R1-103976	Further Evaluations on Transmit Diversity for PUCCH format 2/2a/2b	LG Electronics	
R1-104059	Multiplexing Capacity for LTE-A PUCCH Format 2/2a/2b with Transmit Diversity	Research In Motion UK Limited	

6.4.5 Other

Not treated.

R1-103453	Channel Interleaver design for UL MIMO	Huawei	
R1-103600	Consideration on ACK transmission for multi-antenna PUCCH Format 2b in LTE-A	ZTE	

R1-103606	Precoding for UL SU-MIMO in PHICH-triggered retransmission	ZTE	
R1-103708	Specifying Basic Building Blocks of UL Multi-Antenna Transmission	Texas Instruments	
R1-103709	Precoder selection for non-adaptive HARQ UL SU-MIMO	Texas Instruments	
R1-103811	Performance evaluation on UL SU-MIMO channel interleaver	Nokia Siemens Networks. Nokia	
R1-103895	Uplink re-transmssion without UL grant	Huawei	
R1-103915	UL SU-MIMO precoding in PHICH-triggered non-adaptive retransmissions	Motorola	
R1-103977	Precoding for UL SU-MIMO in PHICH-triggered Retransmission	LG Electronics	

6.5 Uplink RS issues relevant to LTE-A Work Items

6.5.1 DM RS

6.5.1.1 OCC

R1-104219	Way Forward on CS and OCC signaling for UL DMRS	Panasonic, Samsung, Motorola, NTT DOCOMO, NEC, Pantech	

Decision: The document is noted.

Agreement

- For initial transmission the CSI to (CS, OCC) should follow the following
  - CS and OCC for layer 0($n_{DMRS,0}^{(2)}$, $n_{OCC,0}$) is derived from 3-bit cyclic shift indicator (CSI) in UL DCI format.
    - Mapping table between CSI and ($n_{DMRS,0}^{(2)}$, $n_{OCC,0}$)
    - Exact mapping is FFS
  - CS for layer k (k=0,1,2,3) is derived from CS offset according to $n_{DMRS,k}^{(2)}=(n_{DMRS,0}^{(2)}+\Delta_k)$ mod 12
    - CS offsets (Δ_k) for 2 layers are 0, 6 for k=0,1
    - CS offsets (Δ_k) for 4 layers are 0, 6, 3, 9 for k=0, 1, 2, 3
    - CS offsets (Δ_k) for 3 layers are FFS.
- FFS applicability of the above to retransmission cases

Not treated.

R1-103485	UL DMRS configuration with OCC	CATT	
R1-103618	Uplink DM-RS design in LTE-Advanced	Pantech	
R1-103623	OCC configuration for uplink DM-RS	Mitsubishi Electric	
R1-103678	UL DMRS Aspects In Rel-10	Samsung	
R1-103725	Design of OCC / CS Mapping for UL DMRS	Sharp	(R1-103209)
R1-103771	OCC and CS for UL DMRS in SU/MU-MIMO	Panasonic	update of R1-102877
R1-103812	Remaining details on UL DM RS	Nokia Siemens Networks. Nokia	
R1-103896	Subframe-level SGH and signaling design for DM RS	Huawei	

R1-103931	OCC and CS Configuration for Uplink DM-RS	Motorola	
R1-103978	Further Considerations on UL DM-RS for LTE-Advanced	LG Electronics	
R1-104203	Uplink DMRS Resource Configuration for Rel-10	Ericsson, ST-Ericsson	(R1-104112)
R1-104228	Conveying OCC for PUSCH transmissions	Qualcomm Incorporated	(R1-103553)

6.5.1.2 Other

Not treated.

R1-103833	CM reduction of UL RS for carrier aggregation in LTE-A	NEC Group. NTT DOCOMO	

6.5.2 SRS

6.5.2.1 Details of dynamic aperiodic SRS

R1-103710	Email discussion on aspects of dynamic aperiodic SRS	Texas Instruments	

Decision: The email summary is endorsed without formal presentation with the agreement of all participants. For meeting time saving, go direct to WF

R1-104249	Proposal on aperiodic SRS features	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT, Ericsson, ST-Ericsson, Huawei, ITRI, KDDI, LG Electronics, MediaTek, Motorola, Nokia, Nokia Siemens Networks, Panasonic, Qualcomm, Research In Motion, Samsung, Sharp, Texas Instruments, ZTE	

The document was presented by Eko Onggosanusi from TI.
Decision: The document is noted. Hopefully such proposal may be agreable at next meeting. Huawei informed of useful complementary info in R1-104231.

R1-104231	Proposal for UL sounding resource extension	Huawei, Samsung, RIM, Potevio, HTC, CHTTL, Fujitsu, Mitsubishi, Asustek	

Not treated.

R1-103486	On aperiodic SRS transmission in LTE-A	CATT	
R1-103519	Further details on aperiodic sounding reference signals	Ericsson. ST-Ericsson	
R1-103554	Further details on aperiodic dynamic SRS	Qualcomm Incorporated	
R1-103571	Further discussions on aperiodic SRS of Rel-10	MediaTek	
R1-103604	On dynamic aperiodic SRS in LTE-A	ZTE	
R1-103619	Further consideration on the support of Aperiodic SRS durations	Pantech	
R1-103620	Further consideration on Aperiodic SRS transmission with holding scheme	Pantech	

R1-103679	Resources for Dynamic SRS Multiplexing	Samsung	
R1-103711	Outstanding issues on dynamic aperiodic SRS	Texas Instruments	
R1-103726	Necessity of Multi-shot Dynamic Aperiodic SRS	Sharp	
R1-103772	Dynamic aperiodic SRS for LTE-Advanced	Panasonic	
R1-103813	Details of dynamic aperiodic SRS	Nokia Siemens Networks. Nokia	
R1-103897	Considerations for dynamic aperiodic SRS	Huawei	
R1-103932	Further Details on LTE-A Aperiodic SRS	Motorola	
R1-103979	Details on Dynamic Aperiodic Sounding for LTE-Advanced	LG Electronics	
R1-104060	Impact on PDCCH Loading for Aperiodic SRS Scheduling	Research In Motion UK Limited	
R1-104061	Performance Enhancement of Aperiodic SRS with Configurable Duration	Research In Motion UK Limited	
R1-104095	Remaining issues of dynamic aperiodic SRS	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

6.5.2.2 Other enhancements

Not treated.

R1-103712	Increasing sounding resources for Rel-10	Texas Instruments	
R1-103814	Channel sounding enhancements for LTE Advanced uplink	Nokia Siemens Networks. Nokia	
R1-103933	Discussion on other SRS Enhancements for LTE-A Uplink	Motorola	
R1-104031	Periodic SRS for Multi-antenna Transmission	NTT DOCOMO	
R1-104096	Summary of SRS enhancements	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-104121	SRS Assignment for UL MIMO	Mitsubishi Electric	

6.6 Relaying

6.6.1 Backhaul design for Type1 relays

R-PDCCH Interleaving

R1-104223	Way forward on R-PDCCH with CRS	ZTE, Huawei, ETRI, RIM, Qualcomm Inc., Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, LGE	

The document was presented by Yifei Yuan from ZTE.
Decision: The document is noted.

R1-104236	Way forward on R-PDCCH with CRS	Nokia, Nokia Siemens Networks, CATT, CMCC, Motorola, Ericsson, ST-Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	(R1-104235)

The document was presented by Eric Zeng from Nokia.

Discussion (Question / Comment): Mr Chairman asked whether ALU has changed their mind → no ALU is OK with both
Decision: The document is noted.

Agreements:

- For R-PDCCH interleaving with CRS, the following are both supported by the specifications:
  - Rel-8 based REG-level interleaving where the (RN specific) set of semi-statically assigned PRBs determines the virtual system bandwidth used for blind decoding
    - A limited set of not more than 18 interleaving depths (measured in number of PRBs) is supported (in total for UL and DL)
      - Exact set is FFS
    - Each RN searches only one set of assigned PRBs for R-PDCCHs
  - No interleaving across R-PDCCHs in a PRB (sometimes referred to as PRB-level interleaving)
    - (same as DMRS "mode 2")
  - Optionality from implementation perspective will be discussed separately.

DMRS for FDD Case 3

Mr Chairman asked for any way forward → None
Qualcomm questioned whether Interference Estimation could be taken into account by other companies for further simulations.
It was decided that simulation results should be provided by RAN1#62.
Decision to be taken at RAN1#62.

HARQ Operation/Timing

R1-103512	Way forward on Un HARQ timeline FDD	Ericsson, ST- Ericsson, Nokia, Nokia Siemens Networks, Huawei, Panasonic, LG Electronics, ZTE, CATT, Samsung, ETRI, RIM, NEC, ITRI, InterDigital, HTC, LG Nortel, NTT Docomo, Vodafone, CMCC, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Christian Hoymann from Ericsson.
Decision: The document is noted and the way forward is agreed as follows:

- Support the following transmission timing in Rel. 10:
  - If an UL grant is transmitted in subframe #k, the corresponding UL data transmission happens in subframe #(k+4)
  - If DL data is transmitted in subframe #k, the corresponding UL ACK/NACK feedback is transmitted in subframe #(k+4)
- UL HARQ re-transmissions are synchronous w.r.t the HARQ process
  - UL re-transmissions are transmitted in the subframe corresponding to the same UL HARQ process as the initial transmission
    - The identification of UL HARQ processes is FFS until RAN1#62.
  - UL HARQ process ID is not indicated by (R-)PDCCH

Mr Chairman asked whether there was any WF for the TDD case, then decided to look at the following contributions

R1-103514	Un HARQ timing for TDD	Ericsson. ST-Ericsson	

The document was presented by Christian Hoymann from Ericsson and proposes the following principles for LTE TDD:

- Downlink-heavy or symmetric UL-DL allocations are supported in the Un
- For each Un UL subframe, the corresponding DL subframe carrying the UL grant on PDCCH based on Rel-8 timing, is a Un subframe as well (subframe pairs)
- In addition to subframe pairs, standalone DL Un subframes might be allocated
- Consider whether to explicitly signal Un subframes (pairs and standalone) or to predefine certain Un subframe allocation(s) per TDD configuration.

Discussion (Question / Comment): CATT and Nokia agreed with the 3 first proposal but not with the last bullet.
Decision: The document is noted.

R1-103682	Backhaul subframe allocation and HARQ timing for TDD	Samsung	

The document was presented by … from Samsung and provides more detailed views on the backhaul subframe allocation and associated HARQ timing for TDD. Since RAN1 already agreed that configuration 0 and configuration 5 would not be supported for type 1 relaying in Rel-10, only Un subframe configurations for TDD configuration 1,2, 3, 4 and 6 are considered.
Decision: The document is noted.

R1-103584	Backhaul Subframe Allocation in TDD LTE-A Relay	ZTE	

The document was presented by … from ZTE and concludes that, similar to FDD, it was observed that Un UL subframe allocation can be derived from DL subframe configuration based on Rel-8 HARQ timing. UL grant and PUSCH timing implicit allocation is prefered although explicit allocation may provide limited extra flexibility.
Discussion (Question / Comment):
Decision: The document is noted.

R1-103734	Backhaul subframe allocation for TDD	LG Electronics	

The document was presented by … from LGE and proposes:

- The set of UL subframes that can be allocated to Un link is given as follows:
  UL-DL configuration #1: {#3, #8} UL-DL configuration #2: {#2, #7}
  UL-DL configuration #3: {#3} UL-DL configuration #4: {#3}
  UL-DL configuration #6: {#4}
- Rel-8 UL grant timing is reused in Un UL.
- ACK/NACK repetition is used to resolve the UL ACK/NACK blocking problem in Uu link. RN can inform R-UEs of the location of Un UL subframes to avoid unnecessary UE transmission.
- Un UL ACK/NACK timing is determined such that Un DL transmission in subframe #n is acknowledged in the first Un UL subframe that appears after #(n+3).

Decision: The document is noted.

R1-103818	Issues on HARQ over Un Interface for TDD In-band Relay	Nokia, Nokia Siemens Networks	(R1-102970)

The document (section 2.3) was presented by Eric Zeng from Nokia and provides the following proposals:

- Asynchronous HARQ is used for DL Un transmissions; Synchronous HARQ is used for UL Un transmissions and UL Un HARQ RTT is always 10ms for all the supported TDD UL-DL configurations.
- Un Subframe allocations in TDD use 10ms periodicity.

Discussion (Question / Comment): Huawei feels more confortable if second proposal would be based on Rel-8 timing.
Decision: The document is noted.

R1-104048	Backhaul HARQ Timing for LTE-A TDD	Fujitsu	

The document was presented by … from Fujitsu and proposes:

- The UL grant and ACK/NACK feedback for UL Un subframes are transmitted in predefined DL Un subframe
- The ACK/NACK feedback for DL Un subframe is transmitted in predefined UL Un subframe.
- The HARQ timing for DL and UL Un subframe may have to be changed to support symmetric and asymmetric implicit Un subframe configuration for some of the TDD configurations.

Decision: The document is noted.

Agreement:

- Uplink-heavy asymmetric UL-DL subframe configurations are not supported in the Un in Rel-10

Working Assumption:

- Asynchronous HARQ is used for DL Un transmissions; Synchronous HARQ is used for UL Un transmissions and UL Un HARQ RTT is always 10ms for all the supported TDD UL-DL configurations.

Aim for an agreeable way forward at RAN1#62.

R-PDCCH Assignment

R1-103773	R-PDCCH placement	Panasonic	Update of 2881

The document was presented by Ms Ayako Iwata from Panasonic and proposes the following:

- Interleaving across R-PDCCHs in CRS case
  - Interleaving across R-PDCCHs in a PRB (like a Rel.8 PDCCH) is not supported. One PRB carries a (part of) R-PDCCH.
- R-CCE size for no interleaving across R-PDCCHs
  - Variable R-CCE size is preferred.
- Localized and distributed
  - Both are supported for DM-RS and CRS in order to be common design between DM-RS and CRS.

Decision: The document is noted.

R1-103737	Consideration on resource assignment in Un DL	LG Electronics	

The document was presented by … from LGE and can be summarized as follows:

- If a RN detects a DL grant with resource allocation type 0, it assumes that, in the RBG including the DL grant, the PRBs that do not contain the DL/UL grant are used for data transmission for it.

Discussion (Question / Comment): Ericsson questioned the efficiency use of resources
Decision: The document is noted.

R1-103579	Resource configuration of R-PDCCH	ZTE	

The document was presented by Yifei Yuan from ZTE and states that two resource configurations are needed - semi-static resource configurations of R-PDCCH for frequency diversity (e.g. Mode 1) and frequency selectivity (e.g. Mode 2 and Mode 3) should be separate if they coexist in the same backhaul subframe.
Decision: The document is noted.

R1-103883	Performance evaluation of CRS based R-PDCCH	Huawei	

The document was presented by Philippe Sartori from Huawei and clarifies the effect of the CM reduction schemes for UL RS for carrier aggregation.

- Different Sequence Groups for each CC or different cyclic shift sequence for each CC is suitable for LTE-A UL, because the CM decreases to similar CM of QPSK data and the effect is independent of the spacing between the allocated RBs of each CC
- Different phase rotation for each CC is not suitable for LTE-A UL, because the effect of CM reduction depends on the spacing between the allocated RBs of each CC.

Decision: The document is noted.

R1-103899	Rate matching techniques for R-PDCCH	Huawei	

The document was presented by Anthony Soong from Huawei and proposes that the rate matching should be applied on the R-PDCCH in order to make sure that the R-PDCCH high efficiently occupies the allocated RBs when radio link conditions allow it. The exact resource matching scheme is FFS
Decision: The document is noted.

R1-103776	DCI formats for R-PDCCH	Panasonic	Resubmission of 2882

The document was presented by Hidetoshi Suzuki from Panasonic and proposes the followings:

- At least, R-PDCCH should support DCI format 2 and 2B for DL and format 0 for UL.
- Among DCI format 2, 2B and 0, not identify the need of the RN specific modification except format 0/1A differentiation is as reserved.

Decision: The document is noted.

At this point, Mr Chairman decided to close the session.
Encouragement was given to companies to come with joint proposals at next meeting. There is no meeting time now left for individual contributions.
In addition, Mr Chairman asked the rapporteur to prepare/draft the very first version of the TS for further review at next meeting. Action to MCC to provide TS number to the rapporteur (whether a dedicated TS is needed is still to be confirmed/decided at next meeting).

PUCCH

R1-104220	Way forward on Un PUCCH resource in Rel-10	CATT, Nokia, Nokia Siemens Networks, Panasonic, Ericsson, ST-Ericsson, LG Electronics, Huawei, Motorola, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, HTC, ETRI, ITRI, CMCC, NEC, Texas Instruments	

The document was presented by Zukang Shen from CATT.
Discussion (Question / Comment): Qualcomm questioned the reason having several PUCCH resource**(s)**. CATT agreed that there is only one resource.
Decision: The document is noted.

The following is agreed for Rel-10:

- In case of Un PDSCH assigned by R-PDCCH, the PUCCH resource for corresponding ACK/NAK on Un is semi-statically configured by higher layers on a RN specific basis
- The Un PUCCH resource for SR or CSI is semi-statically configured by higher layers on a RN specific basis

Search Space Design

R1-103680	R-PDCCH search space design	Samsung	

Not presented as the speaker was not in the room.

R1-103815	Discussion on R-PDCCH Search Space Design	Nokia, Nokia Siemens Networks	

The document was presented by Eric Zeng from Nokia and proposes:

- For CRS case Mode 2 is supported, i.e., no interleaving across R-PDCCHs in a PRB.
- For CRS case it is FFS whether an extra search space based on joint interleaving is needed. If needed it shall be according to Mode 1-1 for which Rel-8 mechanism is reused to minimize the specification effort.
- Frequency-first mapping of R-PDCCH to physical resources as for Rel-8 PDSCH is utilized for R-PDCCH without joint interleaving in case CRS and/or DM RS are scheduled over the backhaul.

Discussion (Question / Comment): Mr Chairman suggested to agree on proposal 3, but it's premature according to Qualcomm as such Rel-8 based proposal needs further checking.
Decision: The document is noted.

R1-103580	The blind decoding of R-PDCCH	ZTE	

The document was presented by Yifei Yuan from ZTE and draws the following proposals:

- In DM-RS case, the DL grant and UL grant in a PRB pair shall be for the same RN. There is no interleaving between R-PDCCHs of different RNs and each RN has its own PRB pairs.
- In CRS case, all of the DL grants are full interleaved together and mapped into the 1st slot of PRB pairs; all of the UL grants are full interleaved and mapped into the 2nd slot of PRB pairs. Blind decoding complexity can be contained by semi-static configuring several interleaving regions.

Decision: The document is noted.

R1-103834	R-PDCCH blind decoding for Frequency Diversity and Frequency Selective R-PDCCH transmissions	NEC Group	

The document was presented by … from NEC and proposes:

- To change the actual resources used for R-PDCCH transmission dynamically (i.e. on subframe by subframe), and blind decoding at the relay is performed.
- In order to reduce the number of bind decodings, the semi-statically assigned PRBs are divided into subsets where each subset makes a common search space and the relay node attempts the blind decodings based on the PRBs in the subsets.
- In case a large number of Relay nodes are in the cell, it shall be possible to divide the semi-statically assigned PRBs into two or more smaller distinct groups (for example each group is 8PRBs with two subsets), and each distinct group of PRBs are separately monitored by a group of relay nodes.

- To support the co-existence of Frequency diversity and Frequency selective R-PDCCH transmissions in the same subframe of the cell.

Decision: The document is noted.

Not treated.

R1-103454	R-PDCCH design	Huawei	
R1-103455	Un symmetric subframe allocation	Huawei	
R1-103456	Un HARQ timing for Uplink FDD	Huawei	
R1-103487	Considerations on Relay Backhaul Control Channels in LTE-A	CATT	
R1-103488	R-PDCCH design in LTE-A	CATT	
R1-103489	Design of DMRS for Backhaul link in LTE-A	CATT	
R1-103490	Performance evaluation of R-PDCCH with CRS in LTE-A	CATT	
R1-103491	Backhaul subframe allocation and HARQ operation	CATT	
R1-103492	Considerations on backhaul uplink transmissions	CATT	
R1-103510	Discussion of the Un DM-RS pattern for downlink timing case 3	Ericsson. ST-Ericsson	
R1-103513	Un HARQ timing for FDD	Ericsson. ST-Ericsson	
R1-103515	Discussion of UL Un HARQ RTTs	Ericsson. ST-Ericsson	
R1-103516	On the standardisation impact of re-using the PDCCH on Un	Ericsson. ST-Ericsson	
R1-103555	Interleaver for R-PDCCH	Qualcomm Incorporated	
R1-103556	Performance characterization of UE-RS for backhaul link	Qualcomm Incorporated	
R1-103557	Views on HARQ timeline for relays	Qualcomm Incorporated	
R1-103581	Remaining aspects of relay timing	ZTE	
R1-103582	Backhaul DMRS and Related Issues	ZTE	
R1-103583	Discussion on Un UL HARQ RTT for FDD	ZTE	
R1-103681	R-PDCCH interleaving in CRS mode	Samsung	
R1-103735	CSI-RS transmission in backhaul link	LG Electronics	
R1-103736	R-PDCCH interleaving alternatives	LG Electronics	
R1-103738	Consideration on R-PDCCH CCE and REG for interleaving	LG Electronics	
R1-103739	Un DM-RS pattern alternatives for DL timing case 3	LG Electronics	
R1-103777	Proposal on Un UL HARQ (FDD)	Panasonic	
R1-103816	Issues on HARQ over Un Interface for FDD In-band Relay	Nokia, Nokia Siemens Networks	
R1-103817	Discussion on Symmetry and Asymmetry SF Allocation for Backhaul	Nokia, Nokia Siemens Networks	(R1-102971)

R1-103819	Discussion On the UL backhaul Design Aspects	Nokia Siemens Networks. Nokia	
R1-103820	DM RS Pattern for Backhaul	Nokia, Nokia Siemens Networks	
R1-103881	Interleaving of CRS based R-PDCCH	ETRI	
R1-103898	Resource allocation for R-PDCCH	Huawei	
R1-103922	Backhaul control channel design	Motorola	
R1-103923	Relay HARQ	Motorola	
R1-103981	Resource Wastage regarding R-PDCCH interleaving with CRS	LG-Nortel	
R1-103982	Resource allocation of R-PDSCH	Panasonic	
R1-104032	DM-RS Design for Backhaul Link	NTT DOCOMO	
R1-104097	Type 1 Relay Un Configuration and HARQ operation	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-104098	Un DM-RS Pattern for DL timing Case 3	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-104117	Un DM-RS	CMCC	
R1-104118	Un R-PDCCH design	CMCC	
R1-104132	UL/DL HARQ timing for backhaul	Panasonic	(R1-103774)
R1-104133	Comparison of UL/DL HARQ for backhaul	Panasonic	(R1-103775)

6.6.2 Other

R1-104033	Relay Node Capability for Rel-10	NTT DOCOMO, Orange, Deutsche Telekom	

The document was presented by Satoshi Nagata from NTT DoCoMo and deals with additional parameters required for the RN to support at least coverage-improvement scenarios assuming the reuse of the *UE-EUTRA-Capability* IE in Rel-10. It is proposed that:

- DeNB should be informed whether or not inband half-duplex relay is supported as a parameter of the RN capability.

Discussion (Question / Comment): Ericsson clarified the use of parameters.
Decision: The document is noted.

Not treated.

R1-103493	System Evaluation of Relay Performance	CATT	
R1-103558	Enabling range expansion for Type I relays	Qualcomm Incorporated	
R1-103559	DL performance for Type I relays with and without range expansion	Qualcomm Incorporated	
R1-103627	Asymmetric carrier configuration for Relay operation	ITRI	
R1-103821	Type-1 Relay Performance for Uplink	Nokia. Nokia Siemens Networks	(R1-102972)
R1-103835	System Level Performance Evaluation for Relays	NEC Group	
R1-104034	Combination of Carrier Aggregation and Relay in Rel-10	NTT DOCOMO	
R1-104035	Downlink Relay System Performance Evaluation	NTT DOCOMO	

6.7 Network Based Positioning Support for LTE

R1-103871	UTDOA Simulation Results	TruePosition	

The document was presented by Simon Isskav from TruePosition and provides simulation results based on the agreed assumptions for the following two scenarios:

- Dynamic scheduling with SRS
- SPS scheduling with SRS

The results show that using energy from both the SRS UE transmission as well as VOIP payload RB's for the TDOA measurement provides more sensitivity and better accuracy primarily for the 1.7 km ISD deployment use cases.
Decision: The document is noted.

R1-103872	Evaluation for Network Based Positioning	Andrew Corporation	

The document was presented by Ariful Hannan from Andrew and provides additional results showing that SRS signals provide a viable solution for network based positioning techniques.
Decision: The document is noted.

R1-104099	Techniques for improving UTDOA Performance with SRS-only scenario	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Fang-Chen Cheng from Alcatel-Lucent and analyzes the characteristics of SRS interference. The simulation results for full and partial SRS hopping show an improvement in UTDOA performance over no SRS hopping. The UTDOA performance still does not meet the USA FCC mandate performance requirements for terrestrial positioning technology, but the SRS hopping provides at least some gain in the right direction.
Decision: The document is noted.

Evaluation shall continue at next meeting.

6.8 Enhanced ICIC for non-CA based deployments of heterogeneous networks for LTE

WID RP-100383

R1-104238	eICIC Chairman's note	Ad Chair (NTT DoCoMo)	

The document was presented by Tetsushi Abe from NTT DoCoMo and provides the outcomes of eICIC session as reported hereafter under AI 6.8.
Decision: The document is endorsed.

R1-104160	Email summary on WF on Identification of Co-Channel problem and needs in Macro-Pico	CATT	

Decision: The document is noted.

Conclusion:

- Macro-Pico deployment- without any range expansion schemes (scenario 1)
  - DL
    - No Problem for control channel
    - Reuse R8/9 ICIC for data channel
  - UL
    - Reuse R8/9 power control mechanism for both control and data channel
- Other enhancements are FFS

R1-104214	Co-channel Macro cell and Pico cell deployment: way forward	Texas Instruments, Alcatel-Lucent Shanghai Bell, Alcatel-Lucent, Nokia, Nokia Siemens Networks, MediaTek	

Decision: The document is noted. Continue offline discussion.

Not treated.

R1-103822	Enhanced ICIC considerations for HetNet scenarios	Nokia Siemens Networks. Nokia	
R1-103905	Performance of ICIC Enhancement by Channel measurement in Relay Stations	HTC	
R1-104051	Co-channel Interference Aspects in Macro-Femto and Macro-Pico Deployments	CMCC	
R1-104119	Discussion on one solution of eICIC interference management for TDD	CMCC	

6.8.1 Control Channel solutions

Power setting

R1-103846	HeNB eICIC for HetNet	picoChip Designs. Kyocera	

Decision: The document is noted.

R1-104102	Performance Evaluation for Power Control based on Femto Deployment	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	

Decision: The document is noted.

R1-103823	HeNB power setting performance under different access constraints	Nokia Siemens Networks. Nokia	

Decision: The document is noted.

R1-103838	Adjustable HeNB power setting in MeNB – HeNB deployment	NEC Group	

Decision: The document is noted.

Observation:

- Power setting is backwards compatible to Rel-8/9 UE
- For further study, specification impact (what needs to be specified) should be clarified for each power setting scheme.

Time/frequency domain approach

R1-103924	Downlink Control Protection in LTE TDD for non-CA Heterogeneous Networks	Motorola	

Decision: The document is noted.

R1-103494	Analysis of Time-Partitioning Solution for Control Channel	CATT	

Decision: The document is noted.

R1-103713	Views on PDCCH interference mitigation for het-nets	Texas Instruments	

Decision: The document is noted.

R1-103561	Improving control reliability in severe interference conditions	Qualcomm Incorporated	

Decision: The document is noted.

R1-104036	Investigation on CRS interference to Downlink Control Channel	NTT DOCOMO	

Decision: The document is noted.

R1-103458	Analysis on the eICIC schemes for the control channels in HetNet	Huawei	

Decision: The document is noted.

R1-104227	Way forward on eICIC for non-CA based HetNets	AT&T, CMCC, CATT, CHTTL, NTT DoCoMo, LGE, Orange, Philips, Qualcomm, Samsung, Verizon Wireless	(R1-104222)

Decision: The document is noted.

Conclusion:

- Solutions for macro-femto deployment:
- Consider power control and time domain solution as baseline solutions
- Frequency domain solution is not precluded.
- More concrete proposal of each solution should be provided (Revisited on Friday)
  - Ensure backwards compatibility to Rel8/9 UE
  - Strive for at least one common TDD and FDD solution whenever possible
- Feedback from other WGs should be consolidated to make decision
- Applicability of macro-pico scenario is FFS

Friday 2nd

R1-104245	Lightly-scheduled description for Macro-Femto discussion	Motorola	
R1-104247	Concrete proposal for frequency domain solution	Huawei	
R1-104256	eICIC solutions details	Qualcomm Incorporated	(R1-104253)

Decision: The concrete proposals submitted on Friday morning are noted.

Proposal (Friday morning):

- Continue discussion on the description of time domain approach
- Identify the issues that are not supported by current specification to be asked to other WGs.
  - Email discussion to clarify proposals including their impact to other WGs; then to agree LS to RAN2/3/4 when the impacts are clarified. Rapporteur Xiaodong Xu (CMCC) until RAN1#62.

Not treated.

R1-103495	DL Power Setting in Macro-Femto	CATT	
R1-103560	Enabling communication in harsh interference scenarios	Qualcomm Incorporated	
R1-103572	Views on joint time shifting and resource muting scheme for co-channel macro and pico eNBs	MediaTek	
R1-103573	eICIC of PCFICH and PDCCH in MeNB plus HeNBs deployment	MediaTek	
R1-103597	Interference coordination for control channels under non-CA based heterogeneous deployments	ZTE	
R1-103626	Considerations on PBCH eICIC for CSG HeNB	ITRI	
R1-103689	PUCCH interference mitigation in heterogeneous networks	New Postcom	
R1-103740	Evaluation of control channel coordination in co-channel CSG deployment	LG Electronics	
R1-103836	Comparison of control channel protection schemes in MeNB – HeNB deployment	NEC Group	
R1-103837	Necessity of new HeNB frequency selection criteria in MeNB – HeNB deployment	NEC Group	
R1-103861	Evaluation of PDCCH Interference Mitigation in LTE-A	Intel Corporation (UK) Ltd	
R1-104049	Discussion on enhanced ICIC schemes for control channels in HetNet	Fujitsu	
R1-104050	Impact of PDSCH RE muting/puncturing on macro-cell performance	Fujitsu	
R1-104064	Further considerations on non-CA based enhanced ICIC	Ericsson, ST-Ericsson	
R1-104100	Control Channel Performance for Hetnet	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

R1-104126	FDM Range Extension in Open-access Heterogeneous Networks	Motorola	(R1-103920)
R1-104166	Performance analysis of PDCCH interference mitigation techniques in Outdoor Hotzone Het-Net	ZTE	(R1-103873)
R1-104218	PDCCH Interference Mitigation framework in LTE-A	Intel Corporation (UK) Ltd, Kyocera, KDDI, Philips, ITRI, Fujitsu, MediaTek, Potevio, New Postcom	

6.8.2 Data Channels

R1-103685	Performance evaluation of dynamic Home eNB ICIC function based on time domain silencing	Samsung	

Decision: The document is noted.

Not treated.

R1-103496	Enhanced Interference Management by Resource Partitioining	CATT	
R1-103497	DL Interference Mitigation via Direction Information in Het-Net	CATT. ITRI	
R1-103562	Data channel ICIC and the benefits of possible extensions	Qualcomm Incorporated	
R1-103563	Increasing the footprint of low power nodes for improved performance	Qualcomm Incorporated	
R1-103564	HeNB deployment impact on macro network	Qualcomm Incorporated	
R1-103625	Enhanced macro/femto and femto/femto ICIC solutions for data channels	Mitsubishi Electric	
R1-103683	Static/Dynamic Home eNB ICIC function	Samsung	
R1-103690	Downlink ICIC based on power reduction for macro-pico co-channel deployment	New Postcom	
R1-103691	Performance of downlink ICIC using power reduction for macro-pico co-channel deployment with range expansion	New Postcom	
R1-103741	Downlink performance over heterogeneous networks	LG Electronics	
R1-103778	the possibility of UE side ICI cancellation in Hetnet	Panasonic	Resubmission of 2885
R1-103882	Enhancement of Rel-8/9 ICIC mechanisms considering relays	ETRI	
R1-103900	Enhanced ICIC and resource specific CQI measurement	Huawei	
R1-103989	Performance evaluation of EICIC in Macro+pico co-channel deployment of HetNet	Potevio	
R1-104065	Downlink data performance with TDM-based interference coordination	Ericsson, ST-Ericsson	
R1-104103	HetNet Rel-8/9 Data Channel Performance	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-104105	Cognitive Interference Management for Pico-Macro Scenarios	CEWiT	
R1-104106	Cognitive Interference Management for Femto-Macro Scenarios	CEWiT	
R1-104107	Interference cancelling block modulation for spectrally effecient Heterogenous networks with flexible pico-cell deplyoments	CEWiT	
R1-104209	Performance evaluation of static Home eNB ICIC function based on frequency domain silencing	Samsung	(R1-103684)

6.8.3 Cell Association

Not treated.

R1-103457	Impact of Range expansion on control channels for macro and outdoor hotzone	Huawei	
R1-103824	Aspects of Pico Node Range Extension	Nokia Siemens Networks. Nokia	
R1-103988	Downlink performance evaluation for cell selection in Macro+Hotzone deployment of HetNets	Potevio	R1-104125
R1-104063	Effect of Serving Cell Association in Pico/Macro HetNet	CHTTL	
R1-104066	Potential Performance of Range Expansion and PDCCH Interference Management	Kyocera	
R1-104104	Cell Association for HetNet	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-104125	Downlink performance evaluation for cell selection in Macro+Hotzone deployment of HetNets	Potevio	(R1-103988)

6.8.4 Uplink

Not treated.

R1-103498	Evaluation of R8/9 Techniques and Enhancements for PUCCH Interferernce Coordination in Macro-Pico	CATT	
R1-103499	Uplink Data Channel Interference Mitigation via Power Control	CATT	
R1-103565	UL operation in HetNets	Qualcomm Incorporated	
R1-103574	Inter-cell interference mitigation between PRACH and PUCCH/PUSCH in heterogeneous networks	MediaTek	
R1-103686	ICIC Support for SRS Transmissions	Samsung	
R1-103874	PUCCH performance for Co-channel Het-Net	ZTE	
R1-103951	eICIC for HeNB UL and MUE DL based on HeNB UL Measurement	I2R	

6.8.5 Other

Not treated.

R1-103500	Fast Fading Modeling Evaluation for Het-Net Deployment	CATT	
R1-103687	Channel quality feedback enhancement for heterogenous network	Samsung	
R1-103688	Need and feasibility of using different uplink-downlink configurations for TDD HeNBs in heterogeneous networks	New Postcom	
R1-103742	Methods to facilitate the inter-cell coordination in heterogeneous networks	LG Electronics	
R1-103912	UE assumptions on interference	Philips	(R1-102985)
R1-103937	System Performance of HetNet with Pico eNB	Motorola	
R1-103938	Antenna pattern for Pico Cells	Motorola	

6.9 Other

UE categories

R1-103459	Proposal for UE categories and capabilities	Huawei	

The document was presented by Weimin Xiao from Huawei and proposes 3 new UE categories for Release 10 where maximum data rate is defined along with baseline/initial CA/MIMO configuration(s), as follows:

Rel-10 UE categories	DL Max. data rate	DL CA/MIMO configurations (#CCs, #layers)	UL Max. data rate	UL CA/MIMO configurations (#CCs, #layers)
Category 1	300 Mbps	(2, 2)	100 Mbps (no 64 QAM)	(2, 1); (1, 2)
Category 2	600 Mbps	(2, 4); (4, 2) and etc	200/300 Mbps (optional 64 QAM)	(2, 2); (4, 1) and etc
Category 3	1.2 Gbps	(2, 8); (4, 4) and etc	600 Mbps (support 64 QAM)	(2, 4); (4, 2) and etc

Decision: The document is noted.

R1-104193	UE categories for Rel-10 evolution of LTE	Vodafone Group, Orange	(R1-104137)

The document was presented by Prakash Bhat from Vodafone and proposes RAN1 to agree on a new UE category to support UL SU-MIMO on an aggregated carrier(s) of 20 MHz with maximum of 2 layers spatial multiplexing with simultaneous support of 64QAM on each of the layers.
Decision: The document is noted.

R1-103610	UE categories in LTE-A	HTC	

The document was presented by … from HTC and proposes:

- UE categorization principle should consider various supports to LTE-A features in not only Rel.10, but also later releases.
- LTE-A UE categories should be extended from current LTE categories.
- In addition to the highest UE category (1.2/0.6 Gbps), several practical UE categories which enable new feature(s) should also be defined for potential or new market applications as well as mobile phones.

Discussion (Question / Comment): Mediatek asked clarifications on what later releases mean.
Decision: The document is noted.

R1-103913	Capabilities for multi-transceiver UEs	Philips	

The document was presented by Tim Moulsley from Philips and concludes that UEs supporting both carrier aggregation in LTE and MBMS or another RTT may benefit from the possibility of dynamic capability in terms of number of carriers and total data rate. This would allow a UE to use multiple transceivers and defined baseband processing resources in a flexible manner. Considering the various options, provision of dynamic signaling for a limited set of UE capabilities appears promising.
Decision: The document is noted.

R1-104131	LTE Rel-10 UE categories	Nokia, Nokia Siemens Networks	

The document was presented by Asbjorn Grovlen from Nokia and lists the following proposals:

- The DL carrier aggregation capability is signaled using the CA band specified in RAN4.
- For UL carrier aggregation capability, additional signaling is introduced to inform the network of the possible differences in DL and UL aggregation capability.
- Like in Rel-8/9, the UE categories contain parameters for maximum data rate and number of layers supported.
- The UE can indicate different UE categories in the UL and the DL.

In addition, 3 UE categories in the DL and 4 more in the UL are proposed.
Decision: The document is noted.

Further discussions are welcomed during this week and until RAN1#62. Likely an LS to RAN2 shall be prepared by next meeting.

Other

Not treated.

R1-103906	Damage Information-assisted HARQ Scheme for LTE-A	HTC	

7 Closing of the meeting

Rapporteurs would have to work over the summer draft specs expected for review @RAN#62.

Mr Chairman thanked EF3 for hosting and organizing the meeting and all delegates for their involvement and hard working hours during the all week long.
Thks for the CoMP demo

The meeting was closed at 17:14.

Note from Friday morning coffee break.
Tim Moulsley from Philips announced Philips management decision and new policy to not anymore contribute to 3GPP RAN activities. Mr Chairman expressed his thanks for all the achievements made by Tim over the past decade(s) who played a major role in 3GPP standardization. Thanks and applauds to Tim from the whole RAN1 community.

Annex A: List of Tdocs at RAN1 #61bis

Please see excel file attached to this report

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Annex B: List of CRs agreed at RAN1#61bis

Spec	CR	Rev	Rel	Title	Cat	Vsn	TDoc	Source to WG	Work Item	Clauses affected
25.212	0287	1	Rel-9	Clarification of uplink frequencies	F	9.2.0	R1-104152	ZTE	RANimp-DC_HSUPA	3.1
25.213	0107	1	Rel-9	Clarification of uplink frequencies	F	9.1.0	R1-104153	ZTE	RANimp-DC_HSUPA	3.3
25.214	0605	3	Rel-7	Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA_PCH states	F	7.15.0	R1-103868	Infineon Technologies, Qualcomm Incorporated	RANimp-EnhState	6A.1, 6A.1.1A, 6A.1.1B, 6A.1.3.2, 6A.1.3.3
25.214	0606	2	Rel-8	Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA_PCH states	A	8.9.0	R1-103869	Infineon Technologies, Qualcomm Incorporated	RANimp-EnhState	6A.1, 6A.1.1A, 6A.1.1B, 6A.1.3.2, 6A.1.3.3
25.214	0607	2	Rel-9	Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA_PCH states	A	9.2.0	R1-103870	Infineon Technologies, Qualcomm Incorporated	RANimp-EnhState	6A.1, 6A.1.1A, 6A.1.1B, 6A.1.3.2, 6A.1.3.3
25.214	0612	-	Rel-7	Clarification of E-AGCH/E-RGCH monitoring in a CM gap when DL_DRX_Active is TRUE	F	7.15.0	R1-104154	Qualcomm Incorporated	RANimp-CPC	6C.5
25.214	0613	-	Rel-8	Clarification of E-AGCH/E-RGCH monitoring in a CM gap when DL_DRX_Active is TRUE	A	8.9.0	R1-104155	Qualcomm Incorporated	RANimp-CPC	6C.5
25.214	0614	-	Rel-9	Clarification of E-AGCH/E-RGCH monitoring in a CM gap when DL_DRX_Active is TRUE	A	9.2.0	R1-104156	Qualcomm Incorporated	RANimp-CPC	6C.5
36.212	0099	-	Rel-9	Clarify soft buffer size determination for MCH	F	9.2.0	R1-104187	Qualcomm Inc., Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Panasonic, NEC, Ericsson, ST-Ericsson, Nokia, Nokia Siemens Networks	MBMS_LTE	5.1.4.1.2

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CRs endorsed @RAN1#61b

25.211	0284	1	Rel-9	Clarify soft buffer size determination for MCH	F	9.1.0	R1-104170	Qualcomm Inc., Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Panasonic, NEC, Ericsson, ST-Ericsson, Nokia, Nokia Siemens Networks	MBMS_LTE	
25.212	0288	1	Rel-9	Clarify soft buffer size determination for MCH	F	9.2.0	R1-104171	Qualcomm Inc., Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Panasonic, NEC, Ericsson, ST-Ericsson, Nokia, Nokia Siemens Networks	MBMS_LTE	
25.213	0108	1	Rel-9	Clarify soft buffer size determination for MCH	F	9.1.0	R1-104172	Qualcomm Inc., Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Panasonic, NEC, Ericsson, ST-Ericsson, Nokia, Nokia Siemens Networks	MBMS_LTE	
25.214	0611	2	Rel-9	Clarify soft buffer size determination for MCH	F	9.2.0	R1-104175	Qualcomm Inc., Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Panasonic, NEC, Ericsson, ST-Ericsson, Nokia, Nokia Siemens Networks	MBMS_LTE	

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Annex C - 1: List of Outgoing LSs from RAN1#61bis

R1	Response to (Ic LS)	To	Cc	Title	Contact	Ref'd /Attachd Tdoc	Release	WI
R1-104188	None	R2		LS on the description of multi-user MIMO in feature group indicator	Panasonic	None	-	-
R1-104242	None	R2, R3, R4		LS on Draft RAN1 CRs for 4C-HSDPA	Qualcomm	R1-104170, R1-104171, R1-104172, R1-104174	Rel-10	4C_HSDPA
R1-104243	None	R2, R3		LS to RAN2 and RAN3 on Support for different HS-SCCHs in contiguous TTIs in CELL_FACH	Ericsson	R1-103460	Rel-8	RANimp-UplinkEnhState
R1-104258	None	R2, R3, R4		LS on RAN1's agreements on LCR TDD MC-HSUPA	CATT		Rel-10	TDD_MC_HSUPA
R1-104261	None	R2	R4	LS on MBMS UE capability	Panasonic	R1-104260	Rel-9	MBMS_LTE

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Annex C - 2: List of Incoming LSs from RAN1#61bis

Source	Original Tdoc nbr	RAN1 Tdoc nbr	To	Cc	Title	Response to (Ic LS)	Release	WI	Contact
R2	R2-103449	R1-103524	R4	R1	LS on DL timing difference and DL timing reference in Carrier Aggregation		Rel-10	LTE_CA-Core	Qualcomm
R4	R4-101779	R1-103525	R1	R2	Reply LS on UE transmitter structure and power in MC-HSUPA for 1.28Mcps TDD	R1-102577 (R4-101862)	Rel-10	TDD_MC_HSUPA	CATT
R4	R4-102260	R1-103526	R2	R1	Reply LS on pathloss measurements in CA scenarios	R4-101855	Rel-10	LTE_CA-Core	NTT DoCoMo
R4	R4-102268	R1-103527	R2	RAN, R1	LS on in-device coexistence interference		Rel-10	-	CMCC
R4	R4-102337	R1-103528	R1		Reply to LS on DB-DC-HSDPA secondary carrier activation	R1-101685 (R4-101852)	Rel-10		ST-Ericsson
R2	R2-104181	R1-104168	R4	R1	LS on SCell activation/deactivation		Rel-10	LTE_CA-Core	NTT DoCoMo
R2	R2-104209	R1-104264	R1		LS on CIF values		Rel-10	LTE_CA-Core	Qualcomm
R2	R2-104205	R1-104265	R1, R4		Per UE PHR related questions		Rel-10	LTE_CA-Core	MediaTek
R2	R2-104201	R1-104266	R1	R4	LS on status of RAN2 decisions on CA		Rel-10	LTE_CA-Core	Alcatel-Lucent

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Annex D: List of Approved updated WIDs

None

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Annex E: List of draft TSs/TRs agreed at RAN1 #61bis

Tdoc Number	Title	Source	Conclusion/Decision

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Annex F: List of actions

1. **Outgoing LS.**

None

2. **CR approval**

None

3. **Text proposal for TS and TR**

None

4. **Miscellaneous**

[61bis-20-HSPA]
Email discussion to agree evaluation methodology for HS-DPCCH power offsets by Fri 9th July. (Qualcomm)
Done:

[61bis-21-HSPA]
Email discussion until RAN1#62 on which schemes to pick for midamble allocation for MU-MIMO for 1.28Mcps TDD, and whether the standalone midamble allocation is made by the Node B or the RNC. (CATT)
Done:

[61bis-22-HSPA]
Email discussion until RAN1#62 on the extent to which the CELL PORTION concept can be re-used and what additional enhancements may be needed. (ZTE)
Done:

[61bis-01-LTE-A]
Email discussion until RAN1#62 to clarify proposals for control channel solutions for macro-femto het net, including their impact to other WGs; then to agree LS to RAN2/3/4 when the impacts are clarified. Rapporteur Xiaodong Xu (CMCC).
Done:

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Annex G: List of participants at RAN1 #61bis

Please see excel file attached to this report

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Annex H: TSG RAN WG1 meetings in 2010 - 2011

TITLE	TYPE	DATES	LOCATION	CTRY
3GPPRAN1#62	WG	23 – 27 Aug 2010	Madrid	SP
3GPPRAN1#62bis	WG	11 – 15 Oct 2010	Xi'an	China
3GPPRAN1#63	WG	15 – 19 Nov 2010	Jacksonville	US
3GPPRAN1#63bis	WG	17 – 21 Jan 2011	Dublin	Ireland
3GPPRAN1#64	WG	21 – 25 Feb 2011	Taipei	Taiwan
3GPPRAN1#65	WG	9 – 13 May 2011	TBD	JP
3GPPRAN1#66	WG	22 – 26 Aug 2011	Athens	Greece
3GPPRAN1#66bis	WG	10 – 14 Oct 2011	TBD	China
3GPPRAN1#67	WG	14 – 18 Nov 2011	TBD	US

MEETING TYPES	
AH = Ad Hoc	CM = Chairmen's meeting
JM = Joint	OR = Ordinary
PM = Preparatory Meeting	RG = Rapporteurs Group
RM = Resolution Meeting	SG = Steering Group
ST = Startup Meeting	TG = Task Group
WG = Working Group	XO = Extraordinary

End of document

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Appendix D

			3GPP TSG RAN Working Group 1 (Layer 1)		
			List of WG1 Temporary Documents		

Available	Agenda Item	Tdoc Number	Title	Source	Conclusion/ Decision
Yes	2	R1-103430	Draft Agenda for RAN1#61bis meeting	RAN1 Chairman	Approved
Yes	3	R1-103431	Final report of RAN1#61 meeting	MCC Support	Revised
Yes	6.2.3.1	R1-103432	Search space design for cross-CC scheduling	Huawei, CMCC	Noted
Yes	6.2.3.1	R1-103433	Summary of PDCCH BD reduction methods on DSS	Huawei	Not treated
Yes	6.2.3.2	R1-103434	Analysis of Solutions for Handling DCI Format Ambiguity between CSS and UESS at Cross-Carrier Scheduling	Huawei, CMCC	Noted
Yes	6.2.4.1	R1-103435	Explicit HARQ DTX feedback for CA	Huawei	Noted
Yes	6.2.4.1	R1-103436	A/N transmission in TDD CA	Huawei	Noted
Yes	6.2.4.2	R1-103437	SORTD resource allocation for PUCCH format 1a/1b	Huawei	Not treated
Yes	6.2.4.3	R1-103438	CQI/PMI/RI reporting for carrier aggregation	Huawei	Noted
Yes	6.2.5	R1-103439	Uplink multi-antenna power control	Huawei	Not treated
Yes	6.2.5	R1-103440	Consideration of DCI 3/3A for Carrier Aggregation	Huawei	Not treated
Yes	6.2.5	R1-103441	Pathloss derivation for UL PC in LTE-A	Huawei	Not treated
Yes	6.3.1.1	R1-103442	DL DMRS OCC mapping	Huawei	Noted
Yes	6.3.1.2	R1-103443	DMRS pattern for extended CP	Huawei	Noted
Yes	6.3.2.1	R1-103444	Email Discussion on CSI-RS pattern	Huawei	Noted
Yes	6.3.2.1	R1-103445	CSI RS pattern design	Huawei	Revised
Yes	6.3.2.1	R1-103446	Evaluation on muting benefit for CSI RS design	Huawei	Noted
Yes	6.3.4	R1-103447	Performance evaluation of adaptive codebook as enhancement of 4 tx feedback	Huawei	Noted

Yes	6.3.4	R1-103448	DL codebook for 8TX	Huawei	Revised
Yes	6.3.4	R1-103449	Double codebook based Differential feedback for MU-MIMO enhancement	Huawei	Noted
Yes	6.4.1	R1-103450	Uplink transmission modes	Huawei	Not treated
Yes	6.4.2	R1-103451	Remaining issues of of Multiplexing Schemes of control and data in multi-layer PUSCH transmission	Huawei	Noted
Yes	6.4.4	R1-103452	Transmit diversity for PUCCH format 2/2a/2b	Huawei	Not treated
Yes	6.4.5	R1-103453	Channel Interleaver design for UL MIMO	Huawei	Not treated
Yes	6.6.1	R1-103454	R-PDCCH design	Huawei	Not treated
Yes	6.6.1	R1-103455	Un symmetric subframe allocation	Huawei	Not treated
Yes	6.6.1	R1-103456	Un HARQ timing for Uplink FDD	Huawei	Not treated
Yes	6.8.3	R1-103457	Impact of Range expansion on control channels for macro and outdoor hotzone	Huawei	Not treated
Yes	6.8.1	R1-103458	Analysis on the eICIC schemes for the control channels in HetNet	Huawei	Noted
Yes	6.9	R1-103459	Proposal for UE categories and capabilities	Huawei	Noted
Yes	5.1.1	R1-103460	Support for different HS-SCCHs in contiguous TTIs in CELL_FACH	Ericsson. ST-Ericsson	Noted
Yes	5.2.1	R1-103461	Proposed way forward on HS-DPCCH design for 3C-HSDPA w/o MIMO	Ericsson, ST-Ericsson, Nokia Siemens Networks, Nokia, Alcatel-Lucent, Alcatel-	Noted
Yes	5.2.1	R1-103462	HS-DPCCH power offsets for 4C-HSDPA	Ericsson. ST-Ericsson	Noted
Yes	5.2.1	R1-103463	ACK/NACK for 3C-HSDPA without MIMO	Ericsson. ST-Ericsson	Noted
Yes	5.2.1	R1-103464	UE DRX for 4C-HSDPA	Ericsson. ST-Ericsson	Noted
Yes	6.2.2	R1-103465	PHICH collision in LTE-A	CATT	Not treated
Yes	6.2.3.1	R1-103466	PDCCH search space design in LTE-A	CATT	Noted

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Yes	6.2.3.2	R1-103467	Discussion on remaining issues for CIF in LTE-A	CATT	Noted
Yes	6.2.4.1	R1-103468	Performance evaluation of UL ACK/NACK multiplexing methods in LTE-A	CATT	Noted
Yes	6.2.4.1	R1-103469	UL ACK/NAK transmission for TDD with CA	CATT	Noted
Yes	6.2.4.1	R1-103470	DAI Design for LTE-A	CATT	Not treated
Yes	6.2.4.2	R1-103471	PUCCH Format 1/1a/1b Resource Allocation with SORTD	CATT	Not treated
Yes	6.2.4.1	R1-103472	ACK/NAK bundling for FDD with CA	CATT	Noted
Yes	6.2.4.1	R1-103473	PUCCH resource allocation for CA	CATT	Noted
Yes	6.2.4.3	R1-103474	CQI feedback for LTE-A	CATT	Noted
Yes	6.2.5	R1-103475	Discussions on remaining details for LTE-A UL PC	CATT	Noted
Yes	6.3.3.1	R1-103476	Control signaling for DL MIMO	CATT	Not treated
Yes	6.3.3.2	R1-103477	Discussion on the use of DMRS ports/ scrambling sequences	CATT	Not treated
Yes	6.3.4	R1-103478	Control signaling design for dual-codebook operation	CATT	Noted
Yes	6.3.4	R1-103479	Further investigation on 8Tx codebooks	CATT	Not treated
Yes	6.3.4	R1-103480	Multi-granularity codebooks for 4Tx DL MIMO	CATT	Not treated
Yes	6.3.4	R1-103481	Disscussions on dual-codebook feedback framework	CATT	Noted
Yes	6.3.1.2	R1-103482	Further investigation on DMRS design for extended CP	CATT	Noted
Yes	6.3.2.1	R1-103483	Remaining issues on CSIRS design	CATT	Not treated
Yes	6.4.1	R1-103484	Further discussion on signaling of UL MIMO	CATT	Not treated
Yes	6.5.1.1	R1-103485	UL DMRS configuration with OCC	CATT	Not treated
Yes	6.5.2.1	R1-103486	On aperiodic SRS transmission in LTE-A	CATT	Not treated

Yes	6.6.1	R1-103487	Considerations on Relay Backhaul Control Channels in LTE-A	CATT	Not treated
Yes	6.6.1	R1-103488	R-PDCCH design in LTE-A	CATT	Not treated
Yes	6.6.1	R1-103489	Design of DMRS for Backhaul link in LTE-A	CATT	Not treated
Yes	6.6.1	R1-103490	Performance evaluation of R-PDCCH with CRS in LTE-A	CATT	Not treated
Yes	6.6.1	R1-103491	Backhaul subframe allocation and HARQ operation	CATT	Not treated
Yes	6.6.1	R1-103492	Considerations on backhaul uplink transmissions	CATT	Not treated
Yes	6.6.2	R1-103493	System Evaluation of Relay Performance	CATT	Not treated
Yes	6.8.1	R1-103494	Analysis of Time-Partitioning Solution for Control Channel	CATT	Noted
Yes	6.8.1	R1-103495	DL Power Setting in Macro-Femto	CATT	Noted
Yes	6.8.2	R1-103496	Enhanced Interference Management by Resource Partitioining	CATT	Not treated
Yes	6.8.2	R1-103497	DL Interference Mitigation via Direction Information in Het-Net	CATT. ITRI	Not treated
Yes	6.8.4	R1-103498	Evaluation of R8/9 Techniques and Enhancements for PUCCH Interferernce Coordination in Macro-Pico	CATT	Not treated
Yes	6.8.4	R1-103499	Uplink Data Channel Interference Mitigation via Power Control	CATT	Not treated
Yes	6.8.5	R1-103500	Fast Fading Modeling Evaluation for Het-Net Deployment	CATT	Not treated
Yes	6.2.2	R1-103501	On PHICH for carrier aggregation	Ericsson. ST-Ericsson	Not treated
Yes	6.2.3.1	R1-103502	Further consideration on blind decodes for carrier aggregation	Ericsson. ST-Ericsson	Not treated
Yes	6.2.3.1	R1-103503	On search space design for carrier aggregation	Ericsson. ST-Ericsson	Noted
Yes	6.2.3.2	R1-103504	On configuration and reconfiguration of CIF	Ericsson. ST-Ericsson	Noted
Yes	6.2.3.2	R1-103505	On collision between common and UE specific search spaces	Ericsson. ST-Ericsson	Noted
Yes	6.2.4.1	R1-103506	PUCCH design for carrier aggregation	Ericsson. ST-Ericsson	Not treated

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Yes	6.2.4.1	R1-103507	Evaluation of PUCCH proposals for carrier aggregation	Ericsson. ST-Ericsson	Noted
Yes	6.2.4.1	R1-103508	On ACK/NACK codebook performance for carrier aggregation	Ericsson. ST-Ericsson	Noted
Yes	6.2.5	R1-103509	On use cases of DCI format 3/3A	Ericsson. ST-Ericsson	Not treated
Yes	6.6.1	R1-103510	Discussion of the Un DM-RS pattern for downlink timing case 3	Ericsson. ST-Ericsson	Not treated
No	6.6.1	R1-103511	On resource mapping of Un data	Ericsson. ST-Ericsson	Withdrawn
Yes	6.6.1	R1-103512	Way forward on Un HARQ timeline FDD	Ericsson, ST-Ericsson, Nokia, Nokia Siemens Networks, Huawei, Panasonic, LG Electronics, ZTE, CATT, Samsung, ETRI, RIM, NEC, ITRI, InterDigital, HTC, LG Nortel, NTT Docomo, Vodafone, CMCC,	Agreed
Yes	6.6.1	R1-103513	Un HARQ timing for FDD	Ericsson. ST-Ericsson	Not treated
Yes	6.6.1	R1-103514	Un HARQ timing for TDD	Ericsson. ST-Ericsson	Noted
Yes	6.6.1	R1-103515	Discussion of UL Un HARQ RTTs	Ericsson. ST-Ericsson	Not treated
Yes	6.6.1	R1-103516	On the standardisation impact of re-using the PDCCH on Un	Ericsson. ST-Ericsson	Not treated
Yes	6.3.1.1	R1-103517	OCC mapping design in LTE-A	Ericsson. ST-Ericsson	Noted
Yes	6.3.1.2	R1-103518	Discussion on DM-RS pattern for extended CP	Ericsson. ST-Ericsson	Noted
Yes	6.5.2.1	R1-103519	Further details on aperiodic sounding reference signals	Ericsson. ST-Ericsson	Not treated
Yes	6.2.8	R1-103520	Timing alignment for CA	Ericsson. ST-Ericsson	Not treated
No	6.9	R1-103521	UE categories for Rel10	Ericsson. ST-Ericsson	Withdrawn
Yes	6.2.7	R1-103522	UCI on PUSCH	Ericsson. ST-Ericsson	Noted

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Yes	6.3.4	R1-103523	Problem of dual-codebook feedback framework with RF timing misalignment	CATT	Not treated
Yes	4	R1-103524	LS on DL timing difference and DL timing reference in Carrier Aggregation	RAN2. Qualcomm	Noted
Yes	4	R1-103525	Reply LS on UE transmitter structure and power in MC-HSUPA for 1.28Mcps TDD	RAN4. CATT	Noted
Yes	4	R1-103526	Reply LS on pathloss measurements in CA scenarios	RAN4. NTT DoCoMo	Noted
Yes	4	R1-103527	LS on in-device coexistence interference	RAN4. CMCC	Noted
Yes	4	R1-103528	Reply to LS on DB-DC-HSDPA secondary carrier activation	RAN4. ST-Ericsson	Noted
Yes	6.2.6	R1-103529	Signaling scheme for non-contiguous 2-cluster resource allocation.	ASUSTeK	Not treated
Yes	6.2.1	R1-103530	Remaining details of PCFICH with cross-carrier scheduling	Qualcomm Incorporated	Noted
Yes	6.2.2	R1-103531	PHICH for CA operation	Qualcomm Incorporated	Noted
Yes	6.2.3.1	R1-103532	Further details on search space and blind decodes for CA	Qualcomm Incorporated	Noted
Yes	6.2.3.2	R1-103533	Configuring and reconfiguring CIF	Qualcomm Incorporated	Noted
Yes	6.2.4.1	R1-103534	Further link comparisons of multi UL-ACK transmission schemes in support of CA	Qualcomm Incorporated	Noted
Yes	6.2.4.1	R1-103535	Number of bits conveyed on multi-bit ACK PUCCH format	Qualcomm Incorporated	Not treated
Yes	6.2.4.2	R1-103536	UL-ACK resource allocation for DL transmission with single CCE and UL TxD	Qualcomm Incorporated	Not treated
Yes	6.2.4.3	R1-103537	CQI for CA	Qualcomm Incorporated	Noted
Yes	6.2.5	R1-103538	Cross-carrier power control with DCI format 3/3A	Qualcomm Incorporated	Not treated
Yes	6.2.5	R1-103539	Power control for multi-antenna transmission	Qualcomm Incorporated	Not treated
Yes	6.2.6	R1-103540	Multi-cluster PUSCH transmission	Qualcomm Incorporated	Noted
Yes	6.2.7	R1-103541	UCI transmission for CA	Qualcomm Incorporated	Not treated
Yes	6.3.1.1	R1-103542	Details on OCC mapping for DL MIMO operation	Qualcomm Incorporated	Noted
Yes	6.3.1.2	R1-103543	UE-RS patterns for rank 1-4 and extended CP	Qualcomm Incorporated	Noted

Yes	6.3.1.3	R1-103544	Remaining aspects of PRB bundling	Qualcomm Incorporated	Not treated
Yes	6.3.2.1	R1-103545	CSI-RS for LTE-Advanced	Qualcomm Incorporated	Noted
Yes	6.3.3.1	R1-103546	Signaling requirements for transparent MU-MIMO operation	Qualcomm Incorporated	Not treated
Yes	6.3.3.2	R1-103547	DM-RS assignment for MU-MIMO	Qualcomm Incorporated	Not treated
Yes	6.4.1	R1-103548	UL transmission modes for LTE-A operation	Qualcomm Incorporated	Not treated
Yes	6.4.1	R1-103549	UL grants for MIMO transmissions	Qualcomm Incorporated	Revised
Yes	6.4.2	R1-103550	Further details on UCI multiplexing for SU-MIMO transmission	Qualcomm Incorporated	Noted
Yes	6.4.3	R1-103551	PHICH mapping in support of UL MIMO operation	Qualcomm Incorporated	Noted
Yes	6.4.4	R1-103552	Transmit diversity for PUCCH format 2	Qualcomm Incorporated	Not treated
Yes	6.5.1.1	R1-103553	Conveying OCC for PUSCH transmissions	Qualcomm Incorporated	Revised
Yes	6.5.2.1	R1-103554	Further details on aperiodic dynamic SRS	Qualcomm Incorporated	Not treated
Yes	6.6.1	R1-103555	Interleaver for R-PDCCH	Qualcomm Incorporated	Not treated
Yes	6.6.1	R1-103556	Performance characterization of UE-RS for backhaul link	Qualcomm Incorporated	Not treated
Yes	6.6.1	R1-103557	Views on HARQ timeline for relays	Qualcomm Incorporated	Not treated
Yes	6.6.2	R1-103558	Enabling range expansion for Type I relays	Qualcomm Incorporated	Not treated
Yes	6.6.2	R1-103559	DL performance for Type I relays with and without range expansion	Qualcomm Incorporated	Not treated
Yes	6.8.1	R1-103560	Enabling communication in harsh interference scenarios	Qualcomm Incorporated	Not treated
Yes	6.8.1	R1-103561	Improving control reliability in severe interference conditions	Qualcomm Incorporated	Noted
Yes	6.8.2	R1-103562	Data channel ICIC and the benefits of possible extensions	Qualcomm Incorporated	Not treated
Yes	6.8.2	R1-103563	Increasing the footprint of low power nodes for improved performance	Qualcomm Incorporated	Not treated

Yes	6.8.2	R1-103564	HeNB deployment impact on macro network	Qualcomm Incorporated	Not treated
Yes	6.8.4	R1-103565	UL operation in HetNets	Qualcomm Incorporated	Not treated
Yes	6.3.4	R1-103566	Evaluation of Codebook Adaptation with 4TX and PUCCH	Marvell	Noted
Yes	6.3.4	R1-103567	Covariance Compression and Transmission on PUCCH for Codebook Adaptation	Marvell	Noted
Yes	6.3.4	R1-103568	Successive Codebook Refinement: Further Evaluation	Marvell	Noted
Yes	6.3.4	R1-103569	Evaluation of 8TX Codebooks	Marvell	Not treated
Yes	6.2.4.1	R1-103570	Discussion on PUCCH designs for carrier aggregation in LTE-A	MediaTek	Not treated
Yes	6.5.2.1	R1-103571	Further discussions on aperiodic SRS of Rel-10	MediaTek	Not treated
Yes	6.8.1	R1-103572	Views on joint time shifting and resource muting scheme for co-channel macro and pico eNBs	MediaTek	Not treated
Yes	6.8.1	R1-103573	eICIC of PCFICH and PDCCH in MeNB plus HeNBs deployment	MediaTek	Not treated
Yes	6.8.4	R1-103574	Inter-cell interference mitigation between PRACH and PUCCH/PUSCH in heterogeneous networks	MediaTek	Not treated
Yes	6.4.3	R1-103575	PHICH assignment for SU-MIMO	ZTE	Revised
Yes	6.2.3.2	R1-103576	Remaining issues on carrier indicator field	ZTE	Noted
Yes	6.2.3.1	R1-103577	PDCCH search space for cross-carrier scheduling in LTE-A	ZTE	Noted
Yes	6.2.3.1	R1-103578	PDCCH Blind decoding and search space on SCC	ZTE	Not treated
Yes	6.6.1	R1-103579	Resource configuration of R-PDCCH	ZTE	Noted
Yes	6.6.1	R1-103580	The blind decoding of R-PDCCH	ZTE	Noted
Yes	6.6.1	R1-103581	Remaining aspects of relay timing	ZTE	Not treated
Yes	6.6.1	R1-103582	Backhaul DMRS and Related Issues	ZTE	Not treated
Yes	6.6.1	R1-103583	Discussion on Un UL HARQ RTT for FDD	ZTE	Not treated
Yes	6.6.1	R1-103584	Backhaul Subframe Allocation in TDD LTE-A Relay	ZTE	Noted
Yes	6.3.1.1	R1-103585	OCC allocation and OCC mapping	ZTE	Noted

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Yes	6.3.1.2	R1-103586	DMRS design under extended-CP	ZTE	Noted
Yes	6.3.2.2	R1-103587	Investigation on CSI-RS muting	ZTE	Noted
Yes	6.3.2.1	R1-103588	CSI-RS Pattern Design in Normal-CP Subframe	ZTE	Not treated
Yes	6.3.2.1	R1-103589	CSI-RS Pattern Design in Extended-CP Subframe	ZTE	Not treated
Yes	6.3.3.1	R1-103590	Analysis of PDCCH capacity in support of MU-MIMO	ZTE	Not treated
Yes	6.3.3.1	R1-103591	Considerations on downlink control signalling design for MU-MIMO transparency	ZTE	Not treated
Yes	6.3.3.2	R1-103592	Performance study of MU-MIMO with quasi-orthogonal DMRS and orthogonal DMRS	ZTE	Noted
Yes	6.3.3.2	R1-103593	Considerations on downlink control signalling design for DMRS port indication with different MU dimensions	ZTE	Not treated
Yes	6.3.4	R1-103594	Further Discussion on Two-component Feedback Framework for 8Tx	ZTE	Not treated
Yes	6.3.4	R1-103595	Further Performance Evaluation of LTE-A DL MIMO with 2-Level codebook	ZTE	Noted
Yes	6.3.4	R1-103596	Consideration on Signaling for Two-component Feedback	ZTE	Revised
Yes	6.8.1	R1-103597	Interference coordination for control channels under non-CA based heterogeneous deployments	ZTE	Not treated
Yes	6.4.1	R1-103598	PMI signalling for UL MIMO	ZTE	Not treated
Yes	6.4.1	R1-103599	UL Transmission Modes and Signalling requirements for LTE-A	ZTE	Not treated
Yes	6.4.5	R1-103600	Consideration on ACK transmission for multi-antenna PUCCH Format 2b in LTE-A	ZTE	Not treated
Yes	6.4.2	R1-103601	UCI Multiplexing on PUSCH with MIMO Transmission	ZTE	Revised
Yes	6.4.4	R1-103602	Multi-antenna transmission scheme for PUCCH format 2	ZTE	Not treated
Yes	6.2.5	R1-103603	Issues on UL TPC transmission for carrier aggregation	ZTE	Not treated
Yes	6.5.2.1	R1-103604	On dynamic aperiodic SRS in LTE-A	ZTE	Not treated
Yes	6.2.4.1	R1-103605	Evaluation on A/N multiplexing schemes	ZTE	Revised

Yes	6.4.5	R1-103606	Precoding for UL SU-MIMO in PHICH-triggered retransmission	ZTE	Not treated
Yes	6.2.1	R1-103607	PCFICH for cross-carrier scheduling	HTC	Noted
Yes	6.2.3.2	R1-103608	CIF field configuration and release	HTC	Not treated
Yes	6.2.3.2	R1-103609	CIF content mapping	HTC	Not treated
Yes	6.9	R1-103610	UE categories in LTE-A	HTC	Noted
Yes	6.2.6	R1-103611	Comparison of non-contiguous UL RA signaling	Pantech	Not treated
Yes	6.2.6	R1-103612	Further details on the non-contiguous UL RA scheme with limited clusters	Pantech	Not treated
Yes	6.3.2.1	R1-103613	CSI-RS pattern design in LTE-Advanced	Pantech	Not treated
Yes	6.3.3.1	R1-103614	DMRS indicator of DL signalling for Non-transparent MU-MIMO	Pantech	Not treated
Yes	6.3.4	R1-103615	CQI feedback for Downlink MU-MIMO	Pantech	Noted
Yes	6.3.4	R1-103616	On the two stage 8 Tx codebook	Pantech	Not treated
Yes	6.3.4	R1-103617	Companion subset based PMI feedback for rank 1/2 MIMO transmission	Pantech	Not treated
Yes	6.5.1.1	R1-103618	Uplink DM-RS design in LTE-Advanced	Pantech	Not treated
Yes	6.5.2.1	R1-103619	Further consideration on the support of Aperiodic SRS durations	Pantech	Not treated
Yes	6.5.2.1	R1-103620	Further consideration on Aperiodic SRS transmission with holding scheme	Pantech	Not treated
Yes	6.2.6	R1-103621	DCI format for multi-cluster PUSCH resource allocation	Mitsubishi Electric	Not treated
Yes	6.2.6	R1-103622	Details on multi-cluster PUSCH resource allocation schemes	Mitsubishi Electric	Not treated
Yes	6.5.1.1	R1-103623	OCC configuration for uplink DM-RS	Mitsubishi Electric	Not treated
Yes	6.2.3.2	R1-103624	Details on CI-to-CC mapping	Mitsubishi Electric	Not treated
Yes	6.8.2	R1-103625	Enhanced macro/femto and femto/femto ICIC solutions for data channel	Mitsubishi Electric	Not treated
Yes	6.8.1	R1-103626	Considerations on PBCH eICIC for CSG HeNB	ITRI	Not treated
Yes	6.6.2	R1-103627	Asymmetric carrier configuration for Relay operation	ITRI	Not treated
Yes	6.3.1.1	R1-103628	A further consideration for OCC Mapping	ITRI	Noted
Yes	6.2.2	R1-103629	PHICH Resource Indexing with UL CA	Samsung	Noted

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Yes	6.2.3.1	R1-103630	PDCCH Search Space Design for CA	Samsung	Noted
Yes	6.2.3.1	R1-103631	PDCCH Blind Decoding Operations for CA	Samsung	Not treated
Yes	6.2.3.1	R1-103632	Confusion Between DCI Formats for Different CCs. Tx Modes and Bandwidths	Samsung	Not treated
Yes	6.2.3.1	R1-103633	Effectiveness of virtual CRC	Samsung	Not treated
Yes	6.2.3.2	R1-103634	CIF Configuration	Samsung	Noted
Yes	6.2.3.3	R1-103635	PDCCH CC configuration for linkage between PDSCH/PUSCH and PDCCH	Samsung	Not treated
Yes	6.2.4.1	R1-103636	PUCCH HARQ-ACK Signal Transmission for DL CA	Samsung	Noted
Yes	6.2.4.1	R1-103637	PUCCH HARQ-ACK Resource Mapping for DL CA	Samsung	Noted
Yes	6.2.4.1	R1-103638	UL HARQ-ACK Multiplexing: Mapping for 4 Bits	Samsung	Not treated
Yes	6.2.4.1	R1-103639	DAI design for LTE-A TDD	Samsung	Not treated
Yes	6.2.4.1	R1-103640	Discussion on ACK/NACK transmission method for LTE-A TDD	Samsung	Not treated
Yes	6.2.4.2	R1-103641	Transmit Diversity for PUCCH Format 1/1a/1b.	Samsung	Not treated
Yes	6.2.4.3	R1-103642	Support for Increased CSI Feedback Payloads in PUCCH	Samsung	Noted
Yes	6.2.4.3	R1-103643	Concurrent transmission of Scheduling Request indicator and ACK/NACK information for LTE-Advanced	Samsung	Not treated
Yes	6.2.5	R1-103644	Path-Loss Derivation for CA	Samsung	Not treated
Yes	6.2.5	R1-103645	Cross-carrier UL PC for LTE-A	Samsung	Not treated
Yes	6.2.5	R1-103646	Power control for UL SU-MIMO	Samsung	Not treated
Yes	6.2.6	R1-103647	Resource Allocation for Non-Contiguous PUSCH Transmissions	Samsung	Not treated
Yes	6.2.6	R1-103648	Number of Clusters and DCI Format for Non-Contiguous PUSCH Transmissions	Samsung	Noted
Yes	6.2.7	R1-103649	PUSCH Selection for UCI Multiplexing with UL CA	Samsung	Noted

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Yes	6.2.7	R1-103650	HARQ-ACK and RI Multiplexing in PUSCH for DL CA	Samsung	Noted
Yes	6.2.8	R1-103651	Simultaneous PUSCH and PUCCH Transmissions	Samsung	Not treated
Yes	6.2.8	R1-103652	Aperiodic CQI activation in CA	Samsung	Not treated
Yes	6.3.1.1	R1-103653	Discussion on DMRS OCC-4 Mapping	Samsung	Revised
Yes	6.3.1.2	R1-103654	DM RS for extended CP	Samsung	Noted
Yes	6.3.2.1	R1-103655	Discussions on CSI-RS design	Samsung	Not treated
No	6.3.2.1	R1-103656	Impact of CSI-RS reuse factors in LTE-A systems	Samsung	Withdrawn
Yes	6.3.2.2	R1-103657	Discussion on the overhead of muting	Samsung	Noted
Yes	6.3.2.2	R1-103658	Study on efficient power usage of muted off REs for CSI-RS	Samsung	Revised
Yes	6.3.2.3	R1-103659	Study on periodic feedback of PMI/CQI responding to CSI-RS	Samsung	Not treated
Yes	6.3.3.1	R1-103660	Discussions on DL control signalling for LTE-A MU-MIMO	Samsung	Not treated
Yes	6.3.3.1	R1-103661	Discussion on PDCCH capacity considering MU-MIMO	Samsung	Not treated
Yes	6.3.3.1	R1-103662	Compact DCI Design for MU-MIMO	Samsung	Not treated
Yes	6.3.4	R1-103663	Multi-component feedback for SU/MU-MIMO dynamic switching enhancement	Samsung	Noted
Yes	6.3.4	R1-103664	A feedback framework based on W2W1 for Rel. 10	Samsung	Noted
Yes	6.3.4	R1-103665	Performance evaluations of Rel.10 feedback enhancement for 4Tx	Samsung	Noted
Yes	6.3.4	R1-103666	Performance evaluations of Rel.10 feedback framework for 8Tx	Samsung	Revised
Yes	6.3.4	R1-103667	Control signaling to support Rel. 10 feedback framework	Samsung	Noted
Yes	6.3.4	R1-103668	Discussion on CSI-RS based CQI Reporting for Rel-10	Samsung	Not treated
Yes	6.3.5	R1-103669	TX diversity on MBSFN subframe	Samsung	Not treated

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Yes	6.3.5	R1-103670	DL transmission modes for Rel-10	Samsung	Not treated
Yes	6.4.1	R1-103671	Further Discussions on UL MIMO signaling requirements	Samsung	Not treated
Yes	6.4.1	R1-103672	Re-using DCI format0 for UL SU-MIMO retransmission	Samsung	Not treated
Yes	6.4.1	R1-103673	Further discussion on UL SU-MIMO precoding in PHICH-triggered retransmissions	Samsung	Not treated
Yes	6.4.1	R1-103674	PMI signaling in DCI format for UL MIMO	Samsung	Not treated
Yes	6.4.2	R1-103675	Further disucssion on Data and Control Multiplexing in UL MIMO Transmissions	Samsung	Noted
Yes	6.4.3	R1-103676	PHICH Resource Mapping for UL SU-MIMO	Samsung	Noted
Yes	6.4.4	R1-103677	Transmit Diversity for PUCCH Formats 2/2a/2b	Samsung	Not treated
Yes	6.5.1.1	R1-103678	UL DMRS Aspects In Rel-10	Samsung	Not treated
Yes	6.5.2.1	R1-103679	Resources for Dynamic SRS Multiplexing	Samsung	Not treated
Yes	6.6.1	R1-103680	R-PDCCH search space design	Samsung	Not treated
Yes	6.6.1	R1-103681	R-PDCCH interleaving in CRS mode	Samsung	Not treated
Yes	6.6.1	R1-103682	Backhaul subframe allocation and HARQ timing for TDD	Samsung	Noted
Yes	6.8.2	R1-103683	Static/Dynamic Home eNB ICIC function	Samsung	Not treated
Yes	6.8.2	R1-103684	Performance evaluation of static Home eNB ICIC function based on frequency domain silencing	Samsung	Revised
Yes	6.8.2	R1-103685	Performance evaluation of dynamic Home eNB ICIC function based on time domain silencing	Samsung	Noted
Yes	6.8.4	R1-103686	ICIC Support for SRS Transmissions	Samsung	Not treated
Yes	6.8.5	R1-103687	Channel quality feedback enhancement for heterogenous network	Samsung	Not treated
Yes	6.8.5	R1-103688	Need and feasibility of using different uplink-downlink configurations for TDD HeNBs in heterogeneous networks	New Postcom	Not treated
Yes	6.8.1	R1-103689	PUCCH interference mitigation in heterogeneous networks	New Postcom	Not treated

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Yes	6.8.2	R1-103690	Downlink ICIC based on power reduction for macro-pico co-channel deployment	New Postcom	Not treated
Yes	6.8.2	R1-103691	Performance of downlink ICIC using power reduction for macro-pico co-channel deployment with range expansion	New Postcom	Not treated
No	6.3.2.1	R1-103692	Performance evaluation for CSI-RS patterns	New Postcom	Withdrawn
No	6.2.4.1	R1-103693	HARQ-ACK Multiplexing Schemes for Carrier Aggregation	Texas Instruments	Withdrawn
Yes	6.2.7	R1-103694	UCI Transmission on PUSCH for Carrier Aggregation	Texas Instruments	Noted
Yes	6.3.1.3	R1-103695	Remaining details on PRB bundling size	Texas Instruments	Not treated
Yes	6.3.2.1	R1-103696	CSI-RS patterns for LTE-Advanced	Texas Instruments	Not treated
Yes	6.3.2.2	R1-103697	PDSCH muting for inter-cell CSI estimation: Rel-8 UE performance	Texas Instruments	Not treated
Yes	6.3.2.2	R1-103698	PDSCH muting: N-MSE for inter-cell CSI estimation	Texas Instruments	Not treated
Yes	6.3.3.1	R1-103699	On MU-MIMO transparency in Rel-10	Texas Instruments	Not treated
Yes	6.3.3.2	R1-103700	On DMRS dimensioning of MU-MIMO in Rel-10	Texas Instruments	Not treated
Yes	6.3.4	R1-103701	8Tx Codebook Design	Texas Instruments	Not treated
Yes	6.3.4	R1-103702	Link-level simulation results for 8Tx codebook design	Texas Instruments	Not treated
Yes	6.3.4	R1-103703	System-level simulation results for 8Tx codebook design	Texas Instruments	Not treated
Yes	6.3.5	R1-103704	DL MIMO transmission modes in Rel-10	Texas Instruments	Not treated
Yes	6.4.1	R1-103705	Remaining Issues on UL MIMO Transmission Mode and DCI Format Design	Texas Instruments	Not treated
Yes	6.4.2	R1-103706	Remaining Issues on UCI Multiplexing for UL MIMO	Texas Instruments	Noted
Yes	6.4.3	R1-103707	PHICH Resource Allocation Techniques for UL SU-MIMO	Texas Instruments	Noted
Yes	6.4.5	R1-103708	Specifying Basic Building Blocks of UL Multi-Antenna Transmission	Texas Instruments	Not treated
Yes	6.4.5	R1-103709	Precoder selection for non-adaptive HARQ UL SU-MIMO	Texas Instruments	Not treated

Yes	6.5.2.1	R1-103710	Email discussion on aspects of dynamic aperiodic SRS	Texas Instruments	Endorsed
Yes	6.5.2.1	R1-103711	Outstanding issues on dynamic aperiodic SRS	Texas Instruments	Not treated
Yes	6.5.2.2	R1-103712	Increasing sounding resources for Rel-10	Texas Instruments	Not treated
Yes	6.8.1	R1-103713	Views on PDCCH interference mitigation for het-nets	Texas Instruments	Noted
Yes	6.2.1	R1-103714	Cross-carrier PCFICH signaling	Sharp	Noted
Yes	6.2.2	R1-103715	Handling PHICH collisions in Carrier Aggregation	Sharp	Noted
Yes	6.2.4.1	R1-103716	Combined Component Aggregated HARQ A/N	Sharp	Revised
Yes	6.2.4.2	R1-103717	Resource Allocation for PUCCH Format 1a/1b SORTD	Sharp	Not treated
Yes	6.2.4.3	R1-103718	Periodic CQI Reporting for Multiple Component Carriers	Sharp	Noted
Yes	6.2.5	R1-103719	Issues with per-antenna uplink power control	Sharp	Not treated
Yes	6.2.6	R1-103720	Views on Signalling for Non-contiguous PUSCH Resource Allocation	Sharp	Not treated
Yes	6.4.2	R1-103721	Clarification for HARQ-ACK/RI Replica on PUSCH with SU-MIMO	Sharp	Revised
Yes	6.4.2	R1-103722	Codeword and symbol length determination for UCI multiplexing on the PUSCH with SU-MIMO	Sharp	Noted
Yes	6.4.2	R1-103723	UCI Differentiation for Transmission on PUSCH with SU-MIMO	Sharp	Noted
Yes	6.4.4	R1-103724	PUCCH TxD for Formats 2/2a/2b for LTE-Advanced	Sharp	Not treated
Yes	6.5.1.1	R1-103725	Design of OCC / CS Mapping for UL DMRS	Sharp	Not treated
Yes	6.5.2.1	R1-103726	Necessity of Multi-shot Dynamic Aperiodic SRS	Sharp	Not treated
Yes	6.2.3.2	R1-103727	Handling of search space overlap for cross-carrier scheduling	LG Electronics	Noted
Yes	6.2.4.1	R1-103728	Resource allocation for ACK/NACK PUCCH	LG Electronics	Noted
Yes	6.2.4.3	R1-103729	UCI multiplexing for LTE-A	LG Electronics	Not treated
Yes	6.2.5	R1-103730	Cross carrier power control with DCI format 3/3A	LG Electronics	Not treated

Yes	6.2.5	R1-103731	TPC in multiple DL grants	LG Electronics	Not treated
Yes	6.2.7	R1-103732	UCI on PUSCH for carrier aggregation	LG Electronics	Noted
Yes	6.3.2.2	R1-103733	Muting aspects and Intercell CSI-RS design	LG Electronics	Noted
Yes	6.6.1	R1-103734	Backhaul subframe allocation for TDD	LG Electronics	Noted
Yes	6.6.1	R1-103735	CSI-RS transmission in backhaul link	LG Electronics	Not treated
Yes	6.6.1	R1-103736	R-PDCCH interleaving alternatives	LG Electronics	Not treated
Yes	6.6.1	R1-103737	Consideration on resource assignment in Un DL	LG Electronics	Noted
Yes	6.6.1	R1-103738	Consideration on R-PDCCH CCE and REG for interleaving	LG Electronics	Not treated
Yes	6.6.1	R1-103739	Un DM-RS pattern alternatives for DL timing case 3	LG Electronics	Not treated
Yes	6.8.1	R1-103740	Evaluation of control channel coordination in co-channel CSG deployment	LG Electronics	Not treated
Yes	6.8.2	R1-103741	Downlink performance over heterogeneous networks	LG Electronics	Not treated
Yes	6.8.5	R1-103742	Methods to facilitate the inter-cell coordination in heterogeneous networks	LG Electronics	Not treated
Yes	6.2.5	R1-103743	Per UE PHR for carrier aggregation	MediaTek	Not treated
Yes	6.1	R1-103744	Discussion on MBMS UE capability	Panasonic	Noted
Yes	6.1	R1-103745	Draft LS on the description of multi-user MIMO in feature group indicator	Panasonic, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT, Ericsson, Huawei, LGE, Nokia, Nokia Siemens Networks, Potevio	Noted - Revised
Yes	6.2.3.1	R1-103746	Search space for cross carrier scheduling	Panasonic	Noted
Yes	6.2.3.2	R1-103747	CIF reconfiguration issue	Panasonic	Noted
Yes	6.2.3.2	R1-103748	Details of CI-to-CC mapping	Panasonic	Not treated

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Yes	6.2.4.3	R1-103749	Periodic CQI for Carrier Aggregation	Panasonic	Noted
Yes	6.2.3.3	R1-103750	Cross carrier scheduling from SCC to PCC	Panasonic	Not treated
Yes	6.2.4.1	R1-103751	ACK/NACK transmission schemes on PUCCH	Panasonic	Noted
Yes	6.2.4.1	R1-103752	Support of UL ACK/NACK bundling across CC for carrier aggregation	Panasonic	Noted
No	6.2.4.1	R1-103753	Support of UL ACK/NACK channel selection for carrier aggregation	Panasonic	Withdrawn
Yes	6.2.4.2	R1-103754	PUCCH resource indication for SORTD and carrier aggregation	Panasonic	Not treated
Yes	6.2.4.2	R1-103755	SORTD configurations for ACK/NACK information and SRI	Panasonic	Not treated
Yes	6.2.4.3	R1-103756	Discussion on various UL transmission configurations	Panasonic	Not treated
Yes	6.2.4.3	R1-103757	Simultaneous transmission of Scheduling request indicator and ACK/NACK information for LTE-Advanced	Panasonic	Not treated
Yes	6.2.6	R1-103758	Discussion on inter-modulation issue for clustered PUSCH transmission	Panasonic	Not treated
Yes	6.2.6	R1-103759	Signaling for UL non-contiguous resource allocation	Panasonic	Not treated
Yes	6.2.7	R1-103760	ACK/NACK transmission scheme on PUSCH	Panasonic	Noted
Yes	6.2.7	R1-103761	Aperiodic CQI for Carrier Aggregation	Panasonic	Not treated
Yes	6.3.1.1	R1-103762	OCC mapping for DM-RS rank 5~8	Panasonic	Revised
Yes	6.3.2.1	R1-103763	Views on Intra-cell CSI-RS pattern	Panasonic	Not treated
Yes	6.3.2.2	R1-103764	Link level analysis on RE muting for CSI-RS design: Step1 evaluation	Panasonic	Not treated
Yes	6.3.2.2	R1-103765	Link level analysis on RE muting for CSI-RS design: Step2 evaluation	Panasonic	Noted
Yes	6.3.3.2	R1-103766	DMRS port indication with MU-MIMO considerations	Panasonic	Not treated
Yes	6.3.4	R1-103767	Further considerations on 8Tx codebook design	Panasonic	Not treated
Yes	6.3.4	R1-103768	Discussion on aperiodic feedback of PMI/CQI responding to CSI-RS	Panasonic	Noted
Yes	6.4.1	R1-103769	Discussion on uplink transmission mode	Panasonic	Not treated

Yes	6.4.2	R1-103770	UCI multiplexing on PUSCH with MIMO transmission	Panasonic	Noted
Yes	6.5.1.1	R1-103771	OCC and CS for UL DMRS in SU/MU-MIMO	Panasonic	Not treated
Yes	6.5.2.1	R1-103772	Dynamic aperiodic SRS for LTE-Advanced	Panasonic	Not treated
Yes	6.6.1	R1-103773	R-PDCCH placement	Panasonic	Noted
Yes	6.6.1	R1-103774	UL/DL HARQ timing for backhaul	Panasonic	Revised
Yes	6.6.1	R1-103775	Comparison of UL/DL HARQ for backhaul	Panasonic	Revised
Yes	6.6.1	R1-103776	DCI formats for R-PDCCH	Panasonic	Noted
Yes	6.6.1	R1-103777	Proposal on Un UL HARQ (FDD)	Panasonic	Not treated
Yes	6.8.2	R1-103778	the possibility of UE side ICI cancellation in Hetnet	Panasonic	Not treated
Yes	6.2.2	R1-103779	PHICH mapping	Nokia. Nokia Siemens Networks	Not treated
Yes	6.2.3.1	R1-103780	On UE specific search space definitions for cross-CC scheduling for carrier aggregation	Nokia. Nokia Siemens Networks	Noted
Yes	6.2.3.2	R1-103781	Reconfigurations and search spaces overlap conflicts	Nokia Siemens Networks. Nokia	Noted
Yes	6.2.4.1	R1-103782	Multi-A/N performance comparison	Nokia Siemens Networks. Nokia	Noted
Yes	6.2.4.1	R1-103783	On the PUCCH Resource Allocation and A/N Codebook Size for Carrier Aggregation	Nokia Siemens Networks. Nokia	Noted
Yes	6.2.4.1	R1-103784	UL ACK/NAK Feedback for Non-Power-Limited UE in LTE-A TDD	Nokia. Nokia Siemens Networks	Noted
Yes	6.2.4.1	R1-103785	PUCCH Format 1a/1b Resource Allocation in LTE-A TDD	Nokia. Nokia Siemens Networks	Not treated
Yes	6.2.4.1	R1-103786	UL ACK/NAK Feedback in LTE-A TDD	Nokia. Nokia Siemens Networks	Not treated
Yes	6.2.4.1	R1-103787	Evaluation of UL ACK/NAK Bundling Ways in LTE-A TDD	Nokia. Nokia Siemens Networks	Not treated
Yes	6.2.4.1	R1-103788	UL ACK/NAK Feedback for Power-Limited UE in LTE-A TDD	Nokia Siemens Networks. Nokia	Not treated
Yes	6.2.4.2	R1-103789	SORTD resource allocation	Nokia Siemens Networks. Nokia	Not treated

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Yes	6.2.4.1	R1-103790	On the need for cross-carrier A/N bundling	Nokia Siemens Networks. Nokia	Noted
Yes	6.2.4.3	R1-103791	On the PUCCH Multiplexing Combinations for CA	Nokia Siemens Networks. Nokia	Not treated
Yes	6.2.5	R1-103792	Remaining issues on uplink power control	Nokia Siemens Networks. Nokia	Not treated
Yes	6.2.6	R1-103793	Performance evaluation for clustered resource allocation	Nokia Siemens Networks. Nokia	Noted
Yes	6.2.6	R1-103794	RA design for clustered allocation	Nokia. Nokia Siemens Networks	Not treated
Yes	6.2.6	R1-103795	Output power back-off aspects for clustered PUSCH	Nokia Siemens Networks. Nokia	Not treated
Yes	6.2.7	R1-103796	UCI mapping on PUSCH with Carrier Aggregation	Nokia Siemens Networks. Nokia	Noted
Yes	6.2.4.3	R1-103797	CSI reporting for Carrier Aggregation	Nokia Siemens Networks. Nokia	Noted
Yes	6.3.1.2	R1-103798	DM-RS views on extended CP	Nokia. Nokia Siemens Networks	Noted
Yes	6.3.2.1	R1-103799	Intra-cell CSI-RS design	Nokia. Nokia Siemens Networks	Noted
Yes	6.3.2.2	R1-103800	Stage 1 simulation study of RE muting for inter-cell CSI-RS	Nokia. Nokia Siemens Networks	Not treated
Yes	6.3.2.2	R1-103801	Stage 2 simulation study of RE muting for inter-cell CSI-RS	Nokia. Nokia Siemens Networks	Noted
Yes	6.3.2.1	R1-103802	Achievable CQI measurement accuracy over CSI-RS	Nokia. Nokia Siemens Networks	Noted
Yes	6.3.3.2	R1-103803	On the downlink DM-RS support for MU-MIMO in LTE Rel-10	Nokia. Nokia Siemens Networks	Noted
Yes	6.3.4	R1-103804	Double codebook design principles	Nokia. Nokia Siemens Networks	Noted
Yes	6.3.4	R1-103805	Double codebook performance evaluation	Nokia. Nokia Siemens Networks	Noted
Yes	6.3.4	R1-103806	UL CSI feedback channel design & performance	Nokia Siemens Networks. Nokia	Noted
Yes	6.4.1	R1-103807	On UL SU-MIMO transmission modes and control signalling	Nokia Siemens Networks. Nokia	Not treated
Yes	6.4.2	R1-103808	UCI multiplexing on PUSCH with SU-MIMO	Nokia Siemens Networks. Nokia	Noted
Yes	6.4.3	R1-103809	PHICH mapping for UL SU-MIMO	Nokia. Nokia Siemens Networks	Not treated

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Yes	6.4.4	R1-103810	On transmission diversity for PUCCH Format 2/2a/2b	Nokia Siemens Networks. Nokia	Not treated
Yes	6.4.5	R1-103811	Performance evaluation on UL SU-MIMO channel interleaver	Nokia Siemens Networks. Nokia	Not treated
Yes	6.5.1.1	R1-103812	Remaining details on UL DM RS	Nokia Siemens Networks. Nokia	Not treated
Yes	6.5.2.1	R1-103813	Details of dynamic aperiodic SRS	Nokia Siemens Networks. Nokia	Not treated
Yes	6.5.2.2	R1-103814	Channel sounding enhancements for LTE Advanced uplink	Nokia Siemens Networks. Nokia	Not treated
Yes	6.6.1	R1-103815	Discussion on R-PDCCH Search Space Design	Nokia. Nokia Siemens Networks	Noted
Yes	6.6.1	R1-103816	Issues on HARQ over Un Interface for FDD In-band Relay	Nokia. Nokia Siemens Networks	Not treated
Yes	6.6.1	R1-103817	Discussion on Symmetry and Asymmetry SF Allocation for Backhaul	Nokia. Nokia Siemens Networks	Not treated
Yes	6.6.1	R1-103818	Issues on HARQ over Un Interface for TDD In-band Relay	Nokia. Nokia Siemens Networks	Noted
Yes	6.6.1	R1-103819	Discussion On the UL backhaul Design Aspects	Nokia Siemens Networks. Nokia	Not treated
Yes	6.6.1	R1-103820	DM RS Pattern for Backhaul	Nokia. Nokia Siemens Networks	Not treated
Yes	6.6.2	R1-103821	Type-1 Relay Performance for Uplink	Nokia. Nokia Siemens Networks	Not treated
Yes	6.8	R1-103822	Enhanced ICIC considerations for HetNet scenarios	Nokia Siemens Networks. Nokia	Not treated
Yes	6.8.1	R1-103823	HeNB power setting performance under different access constraints	Nokia Siemens Networks. Nokia	Noted
Yes	6.8.3	R1-103824	Aspects of Pico Node Range Extension	Nokia Siemens Networks. Nokia	Not treated
Yes	6.2.1	R1-103825	Remaining issues of PCFICH	NEC Group	Noted
Yes	6.2.2	R1-103826	Views on LTE-A PHICH collision handling	NEC Group	Not treated
Yes	6.2.3.1	R1-103827	Discussions on blind decoding and search spaces	NEC Group	Noted
Yes	6.2.6	R1-103828	Maximum number of clusters and DCI format of non-contiguous UL RA for single Tx antenna	NEC Group	Noted
Yes	6.3.1.3	R1-103829	Remaining issues of PRB bundling	NEC Group	Not treated

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Yes	6.3.3.2	R1-103830	Views on the use of DM RS ports / scrambling sequences for MU-MIMO	NEC Group	Not treated
Yes	6.3.4	R1-103831	Results for MU-MIMO under 4 TX Evaluation Assumptions	NEC Group	Noted
Yes	6.3.4	R1-103832	MU-MIMO: CQI Computation and PMI Selection	NEC Group	Noted
Yes	6.5.1.2	R1-103833	CM reduction of UL RS for carrier aggregation in LTE-A	NEC Group. NTT DOCOMO	Not treated
Yes	6.6.1	R1-103834	R-PDCCH blind decoding for Frequency Diversity and Frequency Selective R-PDCCH transmissions	NEC Group	Noted
Yes	6.6.2	R1-103835	System Level Performance Evaluation for Relays	NEC Group	Not treated
Yes	6.8.1	R1-103836	Comparison of control channel protection schemes in MeNB – HeNB deployment	NEC Group	Not treated
Yes	6.8.1	R1-103837	Necessity of new HeNB frequency selection criteria in MeNB – HeNB deployment	NEC Group	Not treated
Yes	6.8.1	R1-103838	Adjustable HeNB power setting in MeNB – HeNB deployment	NEC Group	Noted
Yes	6.3.4	R1-103839	Design and Evaluation of Precoder Codebooks for CSI Feedback	Ericsson. ST-Ericsson	Noted
Yes	6.3.4	R1-103840	CSI Feedback Signaling	Ericsson. ST-Ericsson	Noted
Yes	6.3.3.1	R1-103841	On DMRS Dimensioning for DL MU-MIMO	Ericsson. ST-Ericsson	Not treated
Yes	6.3.2.1	R1-103842	Considerations on CSI RS	Ericsson. ST-Ericsson	Not treated
Yes	6.3.2.1	R1-103843	Views on Muting	Ericsson. ST-Ericsson	Noted
Yes	6.4.2	R1-103844	Signaling of UCI on PUSCH	Ericsson. ST-Ericsson	Noted
Yes	6.4.2	R1-103845	Resource allocation for UCI on PUSCH	Ericsson. ST-Ericsson	Noted
Yes	6.8.1	R1-103846	HeNB eICIC for HetNet	picoChip Designs.	Noted
Yes	5.1.1	R1-103847	Impact of Unequal P/S-CPICH power setting on CQI reporting procedure when the UE is configured in MIMO mode	Qualcomm Incorporated	Noted
No	5.1.1	R1-103848	25.214 CR0608 (Rel-7. F) Specification of CQI reporting procedure for the Unequal P/S-CPICH power setting case when the UE is configured in MIMO mode	Qualcomm Incorporated	Withdrawn
No	5.1.1	R1-103849	25.214 CR0609 (Rel-8. A) Specification of CQI reporting procedure for the Unequal P/S-CPICH power setting case when the UE is configured in MIMO mode	Qualcomm Incorporated	Withdrawn

No	5.1.1	R1-103850	25.214 CR0610 (Rel-9. A) Specification of CQI reporting procedure for the Unequal P/S-CPICH power setting case when the UE is configured in MIMO mode	Qualcomm Incorporated	Withdrawn
Yes	5.2.1	R1-103851	HS-DPCCH Configuration for 3C without MIMO	Qualcomm Incorporated	Revised
Yes	5.2.1	R1-103852	Ensuring robustness of activation/de-activation of secondary carriers in 4C-HSDPA	Qualcomm Incorporated	Noted
Yes	5.2.1	R1-103853	HS-DPCCH Power Offsets for 4C-HSDPA	Qualcomm Incorporated	Noted
Yes	5.2.2	R1-103854	25.211 CR0284 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm	Noted -
Yes	5.2.2	R1-103855	25.212 CR0288 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm	Noted -
Yes	5.2.2	R1-103856	25.213 CR0108 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm	Noted -
Yes	5.2.2	R1-103857	25.214 CR0611 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm	Noted -
Yes	5.2.2	R1-103858	25.215 CR0198 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm	Withdrawn
Yes	5.6	R1-103859	On deploying DC-HSDPA UEs in Single Carrier	Qualcomm	Revised
Yes	6.3.4	R1-103860	Evaluation of Enhanced MIMO feedbacks for LTE-A	Intel Corporation (UK) Ltd	Noted
Yes	6.8.1	R1-103861	Evaluation of PDCCH Interference Mitigation in LTE-A	Intel Corporation (UK) Ltd	Not treated
Yes	6.2.2	R1-103862	PHICH collision handling for carrier aggregation	Intel Corporation (UK) Ltd	Noted
No	6.2.6	R1-103863	Non-Contiguous PUSCH Resource Allocation Indexing	Intel Corporation (UK) Ltd	Withdrawn
Yes	6.2.3.1	R1-103864	Evaluation on PDCCH Search Space Design	Intel Corporation (UK) Ltd	Noted
Yes	6.3.2.1	R1-103865	Proposal on CSI-RS pattern	Intel Corporation (UK) Ltd	Not treated
Yes	6.3.4	R1-103866	Dual-indicator feedback for Rel-10 extension	Toshiba	Not treated
Yes	6.3.4	R1-103867	Further considerations on Rel-10 feedback design and codebook	Toshiba	Not treated
Yes	5.1.1	R1-103868	25.214 CR0605R3 (Rel-7. F) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH. CELL_PCH and URA_PCH states	Infineon Technologies. Qualcomm	Agreed
Yes	5.1.1	R1-103869	25.214 CR0606R2 (Rel-8. A) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH. CELL_PCH and URA_PCH states	Infineon Technologies. Qualcomm	Agreed
Yes	5.1.1	R1-103870	25.214 CR0607R2 (Rel-9. A) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH. CELL_PCH and URA_PCH states	Infineon Technologies. Qualcomm	Agreed
Yes	6.7	R1-103871	UTDOA Simulation Results	TruePosition	Noted
Yes	6.7	R1-103872	Evaluation for Network Based Positioning	Andrew Corporation	Noted

Yes	6.8.1	R1-103873	Performance analysis of PDCCH interference mitigation techniques in Outdoor Hotzone Het-Net	ZTE	Revised
Yes	6.8.4	R1-103874	PUCCH performance for Co-channel Het-Net	ZTE	Not treated
Yes	5.4	R1-103875	Discussion on special default midamble allocation scheme for LCR TDD MU-MIMO	ZTE	Noted
Yes	5.4	R1-103876	Discussion of logical resource tag ID allocation scheme for MU-MIMO of 1.28Mcps TDD	ZTE,Potevio	Noted
Yes	5.3	R1-103877	Consideration on UPH of 1.28M TDD MC-HSUPA	ZTE	Noted
Yes	5.5	R1-103878	Discussion on measurement in distributed antenna scenario for 1.28Mcps TDD	ZTE	Revised
Yes	5.5	R1-103879	Summary from email discussion on Improvements of distributed antenna for 1 28Mcps TDD	ZTE	Noted
Yes	6.2.3.2	R1-103880	DCI format ambiguity in the overlapping region of common and UE-specific search spaces in cross-carrier scheduling	ETRI	Noted
Yes	6.6.1	R1-103881	Interleaving of CRS based R-PDCCH	ETRI	Not treated
Yes	6.8.2	R1-103882	Enhancement of Rel-8/9 ICIC mechanisms considering relays	ETRI	Not treated
Yes	6.6.1	R1-103883	Performance evaluation of CRS based R-PDCCH	Huawei	Noted
Yes	6.2.4.1	R1-103884	Evaluation of ACK/NACK transmission schemes for carrier aggregation	Huawei	Noted
Yes	6.2.4.1	R1-103885	On the necessity of ACK/NACK bundling for carrier aggregation	Huawei	Noted
Yes	6.2.4.1	R1-103886	A/N Codebook Design for Carrier Aggregation using format 2 and DFT-S-OFDM	Huawei	Not treated
Yes	6.2.4.3	R1-103887	Simultaneous transmission of CQI, ACK/NACK or SRI on PUCCH in Carrier Aggregation	Huawei	Not treated
Yes	6.2.5	R1-103888	Performance evaluation of approaches for multi-antenna power control	Huawei	Not treated
Yes	6.2.6	R1-103889	UL Non-contiguous Transmission for CA	Huawei	Not treated
Yes	6.2.7	R1-103890	UCI on PUSCH for carrier aggregation	Huawei	Noted
Yes	6.3.1.3	R1-103891	Remaining issues for DMRS bundling	Huawei	Not treated
Yes	6.3.3.2	R1-103892	DMRS for MU MIMO	Huawei	Not treated
Yes	6.4.1	R1-103893	Control signalling design for UL MIMO	Huawei	Not treated

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Yes	6.4.3	R1-103894	Discussion on PHICH resource allocation for UL MIMO	Huawei	Not treated
Yes	6.4.5	R1-103895	Uplink re-transmssion without UL grant	Huawei	Not treated
Yes	6.5.1.1	R1-103896	Subframe-level SGH and signaling design for DM RS	Huawei	Not treated
Yes	6.5.2.1	R1-103897	Considerations for dynamic aperiodic SRS	Huawei	Not treated
Yes	6.6.1	R1-103898	Resource allocation for R-PDCCH	Huawei	Not treated
Yes	6.6.1	R1-103899	Rate matching techniques for R-PDCCH	Huawei	Noted
Yes	6.8.2	R1-103900	Enhanced ICIC and resource specific CQI measurement	Huawei	Not treated
Yes	6.2.5	R1-103901	remaining aspect of UL power control	HTC	Not treated
No	6.2.4.3	R1-103902	Simultaneous Transmission of SR and ACK/NACK	HTC	Withdrawn
Yes	6.3.4	R1-103903	Enhanced PMI Indication for Refining MIMO Precoder Codebook	HTC	Noted
Yes	6.2.2	R1-103904	PHICH collision handling in carrier aggregation	HTC	Not treated
Yes	6.8	R1-103905	Performance of ICIC Enhancement by Channel measurement in Relay Stations	HTC	Not treated
Yes	6.9	R1-103906	Damage Information-assisted HARQ Scheme for LTE-A	HTC	Not treated
Yes	6.2.3.2	R1-103907	Review of CIF Reconfiguration	Philips	Noted
Yes	6.2.4.1	R1-103908	Summary of email discussion on PUCCH A/N multiplexing for CA	Philips	Noted
Yes	6.3.4	R1-103909	Codebook alphabet and PA power balance	Philips	Not treated
Yes	6.3.4	R1-103910	Analysis of polarisation aspects in rank 2 transmission	Philips	Not treated
Yes	6.3.5	R1-103911	Correction to Cross-Polar Channel Modelling in TR36.814	Philips	Not treated
Yes	6.8.5	R1-103912	UE assumptions on interference	Philips	Not treated
Yes	6.9	R1-103913	Capabilities for multi-transceiver UEs	Philips	Noted
Yes	6.2.5	R1-103914	UL Power Control for Multi-Antenna UE	Motorola	Not treated

Yes	6.4.5	R1-103915	UL SU-MIMO precoding in PHICH-triggered non-adaptive retransmissions	Motorola	Not treated
Yes	6.4.2	R1-103916	UCI Multiplexing on PUSCH in UL-MIMO Transmissions	Motorola	Revised
Yes	6.3.4	R1-103917	Two-component Feedback Design and Codebooks	Motorola	Revised
Yes	6.3.2.1	R1-103918	CSI-RS Pattern Design	Motorola	Not treated
Yes	6.2.6	R1-103919	Comparison of Non-contiguous PUSCH resource allocation techniques	Motorola	Revised
Yes	6.8.1	R1-103920	FDM Range Extension in Open-access Heterogeneous Networks	Motorola	Revised
No	6.8.1	R1-103921	TDM Range Extension Performance for Pico cells	Motorola	Withdrawn
Yes	6.6.1	R1-103922	Backhaul control channel design	Motorola	Not treated
Yes	6.6.1	R1-103923	Relay HARQ	Motorola	Not treated
Yes	6.8.1	R1-103924	Downlink Control Protection in LTE TDD for non-CA Heterogeneous Networks	Motorola	Noted
Yes	6.2.3.2	R1-103925	Further Details on PDCCH Design with CIF	Motorola	Noted
No	6.2.5	R1-103926	Further Details on UL Power control with CA	Motorola	Withdrawn
No	6.9	R1-103927	UE Category aspects for LTE-A	Motorola	Withdrawn
Yes	6.3.1.2	R1-103928	Extended CP DM-RS Pattern	Motorola	Noted
Yes	6.3.3.2	R1-103929	Orthgonal DM-RS Ports and length-4 OCC Design for Transparent MU-MIMO	Motorola	Not treated
Yes	6.4.1	R1-103930	Control Signalling for UL MIMO	Motorola	Not treated
Yes	6.5.1.1	R1-103931	OCC and CS Configuration for Uplink DM-RS	Motorola	Not treated
Yes	6.5.2.1	R1-103932	Further Details on LTE-A Aperiodic SRS	Motorola	Not treated
Yes	6.5.2.2	R1-103933	Discussion on other SRS Enhancements for LTE-A Uplink	Motorola	Not treated
Yes	6.2.4.1	R1-103934	Uplink ACK/NACK Transmission Format for Carrier Aggregation	Motorola	Noted

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Yes	6.2.6	R1-103935	Resource allocation schemes for non-contiguous PUSCH	Motorola	Not treated
Yes	6.2.2	R1-103936	PHICH Resource Selection for LTE-A	Motorola	Not treated
Yes	6.8.5	R1-103937	System Performance of HetNet with Pico eNB	Motorola	Not treated
Yes	6.8.5	R1-103938	Antenna pattern for Pico Cells	Motorola	Not treated
Yes	6.3.4	R1-103939	Results on W1W2 and W2W1 feedback for 8Tx and 4Tx	Motorola	Noted
Yes	6.3.2.1	R1-103940	Muting, Interference estimation and reuse factors for CSI-RS	Motorola	Noted
Yes	6.3.3.2	R1-103941	Results on DM RS port allocation for MU-MIMO	Motorola	Not treated
Yes	6.3.3.1	R1-103942	Transparent MU-MIMO operation for Rel-10	Motorola	Not treated
Yes	6.3.2.1	R1-103943	Intra-cell CSI-RS pattern proposal	Motorola	Not treated
Yes	6.4.3	R1-103944	PHICH Mapping for UL SU-MIMO	Motorola	Not treated
Yes	6.2.4.1	R1-103945	Link-level evaluation of PUCCH proposals for Carrier Aggregation	InterDigital Communications, LLC	Revised
Yes	6.3.4	R1-103946	Performance evaluation of two-matrix based feedback for 4 Tx	InterDigital Communications, LLC	Noted
Yes	5.2.1	R1-103947	Considerations regarding HS-DPCCH design for 3C without MIMO	InterDigital Communications, LLC	Noted
Yes	5.2.1	R1-103948	PCI/CQI coding and mapping for 4C-HSDPA	InterDigital Communications, LLC	Noted
No	5.2.1	R1-103949	Considerations for UE Power Savings for 4C-HSDPA	InterDigital Communications, LLC	Withdrawn
Yes	5.2.1	R1-103950	Open issues for UL Feedback design for 4C-HSDPA	InterDigital Communications, LLC	Noted
Yes	6.8.4	R1-103951	eICIC for HeNB UL and MUE DL based on HeNB UL Measurement	I2R	Not treated
Yes	6.3.4	R1-103952	Codebook system evaluations	Qualcomm Incorporated	Noted
Yes	6.4.1	R1-103953	UL MIMO scheme for retransmissions triggered by PHICH	Qualcomm Incorporated	Not treated
Yes	6.2.1	R1-103954	Remaining Issues for PDSCH Starting Point Indication with Cross-carrier Scheduling	LG Electronics	Noted
Yes	6.2.2	R1-103955	PHICH Resource Mapping in Carrier Aggregation	LG Electronics	Not treated

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Yes	6.2.3.1	R1-103956	Considerations on PDCCH Blind Decoding in Carrier Aggregation	LG Electronics	Not treated
Yes	6.2.3.1	R1-103957	UE-specific Search Space Design for Cross-Carrier Scheduling	LG Electronics	Noted
Yes	6.2.3.2	R1-103958	Considerations on CIF Initialization and Reconfiguration	LG Electronics	Noted
Yes	6.2.3.2	R1-103959	Carrier Index (CI) Configuration per UE for Carrier Aggregation	LG Electronics	Not treated
Yes	6.2.3.2	R1-103960	Uplink CC-to-CI Mapping for Carrier Aggregation	LG Electronics	Not treated
Yes	6.2.4.1	R1-103961	Evaluation on A/N multiplexing schemes	LG Electronics	Noted
Yes	6.2.4.2	R1-103962	Resource Allocation for SORTD	LG Electronics	Not treated
Yes	6.2.5	R1-103963	Consideration on power control for UL multiple antenna transmission	LG Electronics	Not treated
Yes	6.2.6	R1-103964	Non-Contiguous PUSCH Resource Allocation Scheme on LTE-A	LG Electronics	Not treated
Yes	6.3.1.2	R1-103965	Remaining Issues on DM-RS Pattern for Extended CP	LG Electronics	Noted
Yes	6.3.1.3	R1-103966	Remaining Details on PRB bundling	LG Electronics	Not treated
Yes	6.3.2.1	R1-103967	Intra-cell CSI-RS Pattern Design	LG Electronics	Noted
Yes	6.3.3.1	R1-103968	Discussion on MU-MIMO Transparency in LTE-A	LG Electronics	Not treated
Yes	6.3.3.2	R1-103969	DM-RS Support for Downlink MU-MIMO in Rel-10	LG Electronics	Not treated
Yes	6.3.4	R1-103970	Feedback Codebook Design and Performance Evaluation	LG Electronics	Not treated
Yes	6.3.4	R1-103971	Consideration on Feedback Design for Rel-10	LG Electronics	Noted
Yes	6.3.5	R1-103972	Remaining Issues on Downlink TxD in LTE-A Subframe	LG Electronics	Not treated
Yes	6.4.1	R1-103973	Discussion on Control Signaling for Uplink Transmission Mode	LG Electronics	Not treated
Yes	6.4.2	R1-103974	UCI Multiplexing for Multi-layer PUSCH Transmission	LG Electronics	Noted
Yes	6.4.3	R1-103975	PHICH Resource Assignment for UL SU-MIMO	LG Electronics	Not treated

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Yes	6.4.4	R1-103976	Further Evaluations on Transmit Diversity for PUCCH format 2/2a/2b	LG Electronics	Not treated
Yes	6.4.5	R1-103977	Precoding for UL SU-MIMO in PHICH-triggered Retransmission	LG Electronics	Not treated
Yes	6.5.1.1	R1-103978	Further Considerations on UL DM-RS for LTE-Advanced	LG Electronics	Not treated
Yes	6.5.2.1	R1-103979	Details on Dynamic Aperiodic Sounding for LTE-Advanced	LG Electronics	Not treated
Yes	6.3.2.2	R1-103980	Evaluation results of PDSCH muting for CSI RS design	CATR	Not treated
Yes	6.6.1	R1-103981	Resource wastage regarding R-PDCCH interleaving with CRS	LG-Nortel	Not treated
Yes	6.6.1	R1-103982	Resource allocation of R-PDSCH	Panasonic	Not treated
Yes	5.3	R1-103983	Discussion on DRX in MC-HSUPA for 1.28Mcps TDD	CATT	Noted
Yes	5.3	R1-103984	Discussion on UPH in MC-HSUPA for 1.28Mcps TDD	CATT	Noted
Yes	5.4	R1-103985	Discussion on optimization of E-HICH signature sequence allocation in MU-MIMO	CATT	Noted
Yes	5.4	R1-103986	Discussion on association between midambles and channelisation codes for MU-MIMO	CATT	Noted
Yes	5.4	R1-103987	Control channel design in MU-MIMO for LCR TDD	CATT, ZTE	Revised
Yes	6.8.3	R1-103988	Downlink performance evaluation for cell selection in Macro+Hotzone deployment of HetNets	Potevio	Revised
Yes	6.8.2	R1-103989	Performance evaluation of EICIC in Macro+pico co-channel deployment of HetNet	Potevio	Not treated
Yes	6.2.3.1	R1-103990	Search space design in carrier aggregation	Potevio	Noted
Yes	6.1	R1-103991	36.213 DraftCR (Rel-8, F) Small correction to PUSCH power control parameter	Potevio	Noted
Yes	6.1	R1-103992	36.213 DraftCR (Rel-9, A) Small correction to PUSCH power control parameter	Potevio	Noted
Yes	5.1.2	R1-103993	25224 CR0253 (Rel-8, F) Clarification on HS-DSCH transmission in CELL_PCH or URA_PCH state for 1.28Mcps TDD	TD Tech	Noted
Yes	5.1.2	R1-103994	25224 CR0254 (Rel-9, A) Clarification on HS-DSCH transmission in CELL_PCH or URA_PCH state for 1.28Mcps TDD	TD Tech	Noted
Yes	5.3	R1-103995	Discussion on E-HICH allocation for 1.28Mcps TDD MC-HSUPA	TD Tech	Noted
Yes	5.3	R1-103996	Discussion on DRX procedures for 1.28Mcps TDD MC-HSUPA	TD Tech	Noted

Yes	5.3	R1-103997	Discussion on UPH for 1.28Mcps TDD MC-HSUPA	TD Tech	Noted
Yes	5.4	R1-103998	E-HICH signature sequence allocation for 1.28Mcps TDD MU MIMO	TD Tech	Noted
Yes	5.4	R1-103999	Discussion on midamble allcation for 1.28Mcps TDD MU-MIMO	TD Tech	Noted
Yes	5.4	R1-104000	Control Channel design for 1.28Mcps TDD MU-MIMO	TD Tech	Noted
Yes	6.1	R1-104001	Draft Rel-8 CR on correction on CRS transmission	CATT	Noted
Yes	6.1	R1-104002	Draft Rel-9 CR on correction on CRS transmission	CATT	Noted
Yes	5.1.1	R1-104003	25.214 CR0602R2 (Rel-7, F) Clarification of the CQI definition when the UE is configured in MIMO mode	Huawei, Qualcomm Incorporated, InterDigital Communication LLC	Noted - Revised
Yes	5.1.1	R1-104004	25.214 CR0603R2 (Rel-8, A) Clarification of the CQI definition when the UE is configured in MIMO mode	Huawei, Qualcomm Incorporated, InterDigital Communication LLC	Noted - Revised
Yes	5.1.1	R1-104005	25.214 CR0604R2 (Rel-9, A) Clarification of the CQI definition when the UE is configured in MIMO mode	Huawei, Qualcomm Incorporated, InterDigital Communication LLC	Noted - Revised
Yes	5.1.1	R1-104006	Activation state of the secondary uplink frequency	Huawei	Noted
Yes	5.2.1	R1-104007	HS-DPCCH design for 3C-HSDPA without MIMO	Huawei	Noted
Yes	5.2.1	R1-104008	HARQ-ACK codebook design for 3C-HSDPA without MIMO	Huawei	Noted
Yes	5.2.1	R1-104009	Discussion on DTX codeword for HARQ-ACK of 4C-HSDPA	Huawei	Noted
Yes	5.2.1	R1-104010	Discussion on HS-SCCH order reliability	Huawei	Revised
Yes	6.2.1	R1-104011	On RRC signaling of PDSCH starting position	NTT DOCOMO	Noted
Yes	6.2.3.1	R1-104012	Investigation on UE-specific Search Space for Carrier Aggregation	NTT DOCOMO	Noted
Yes	6.2.3.2	R1-104013	UE-specific Search Space during CIF reconfiguration	NTT DOCOMO	Noted
Yes	6.2.4.1	R1-104014	Uplink ACK/NACK Transmission Schemes for Carrier Aggregation	NTT DOCOMO	Not treated
Yes	6.2.4.1	R1-104015	Investigation on PUCCH Format for Full A/N Transmission	NTT DOCOMO	Noted
Yes	6.2.4.1	R1-104016	Uplink ACK/NACK Resource Assignments for Carrier Aggregation	NTT DOCOMO	Noted
Yes	6.2.5	R1-104017	CC-common TPC Command for UL Carrier Aggregation	NTT DOCOMO	Not treated
Yes	6.2.5	R1-104018	Uplink Power Control for Multi-antenna Transmission	NTT DOCOMO	Not treated

Yes	6.2.6	R1-104019	Further Discussion on Signaling to Support Non-contiguous RB Allocation	NTT DOCOMO	Not treated
Yes	6.3.3.1	R1-104020	Transparent/Non-transparent MU-MIMO in LTE-Advanced	NTT DOCOMO	Not treated
Yes	6.3.3.1	R1-104021	Control Signaling to Support for Enhanced DL MIMO	NTT DOCOMO	Not treated
Yes	6.3.3.2	R1-104022	DMRS Configuration for DL MU-MIMO in LTE-Advanced	NTT DOCOMO	Not treated
Yes	6.3.4	R1-104023	Further Views on CSI Feedback Signaling on PUSCH/PUCCH for LTE-Advanced	NTT DOCOMO	Noted
Yes	6.3.2.1	R1-104024	Intra-cell CSI-RS Design	NTT DOCOMO	Revised
Yes	6.3.2.2	R1-104025	MSE Performance Evaluation of RE Muting for Inter-cell CSI-RS	NTT DOCOMO	Not treated
Yes	6.3.2.2	R1-104026	Throughput Performance Evaluation of RE Muting for Inter-cell CSI-RS	NTT DOCOMO	Noted
Yes	6.3.2.2	R1-104027	Summary of email discussion on PDSCH muting	NTT DOCOMO	Noted
Yes	6.3.1.1	R1-104028	Design Criteria for Length-4 OCC Mapping	NTT DOCOMO, CATT	Noted
No	6.4.1	R1-104029	Views on Control Signaling to Support UL SU-MIMO	NTT DOCOMO	Withdrawn
Yes	6.4.3	R1-104030	PHICH Resource Mapping Design for SU-MIMO	NTT DOCOMO	Noted
Yes	6.5.2.2	R1-104031	Periodic SRS for Multi-antenna Transmission	NTT DOCOMO	Not treated
Yes	6.6.1	R1-104032	DM-RS Design for Backhaul Link	NTT DOCOMO	Not treated
Yes	6.6.2	R1-104033	Relay Node Capability for Rel-10	NTT DOCOMO, Orange, Deutsche Telekom	Noted
Yes	6.6.2	R1-104034	Combination of Carrier Aggregation and Relay in Rel-10	NTT DOCOMO	Not treated
Yes	6.6.2	R1-104035	Downlink Relay System Performance Evaluation	NTT DOCOMO	Not treated
Yes	6.8.1	R1-104036	Investigation on CRS interference to Downlink Control Channel	NTT DOCOMO	Noted
Yes	5.1.1	R1-104037	RF impact of multi-carrier HSDPA	ZTE	Noted
Yes	5.1.1	R1-104038	25.212 CR0287 (Rel-9, F) Clarification of uplink	ZTE	Noted -
Yes	5.1.1	R1-104039	25.213 CR0107 (Rel-9, F) Clarification of uplink	ZTE	Noted -
Yes	5.2.1	R1-104040	HS-DPCCH design for 3C-HSDPA without MIMO configuration	ZTE	Revised

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Yes	6.2.3.1	R1-104041	Location of UE-specific search space	Fujitsu	Noted
Yes	6.2.3.3	R1-104042	CIF inclusion in Msg0	Fujitsu	Not treated
Yes	6.2.4.3	R1-104043	Considerations on Periodic CQI Feedback for Carrier Aggregation	Fujitsu	Noted
Yes	6.2.8	R1-104044	Aperiodic CQI reporting for multiple DL component carriers	Fujitsu	Not treated
Yes	6.3.1.1	R1-104045	DM-RS OCC design for Rank 5-8 in LTE-Advanced	Fujitsu	Noted
Yes	6.3.4	R1-104046	CSI Feedback for LTE-A with double codebook structure	Fujitsu	Noted
Yes	6.3.4	R1-104047	Discussion on Feedback Design for LTE-A	Fujitsu	Not treated
Yes	6.6.1	R1-104048	Backhaul HARQ Timing for LTE-A TDD	Fujitsu	Noted
Yes	6.8.1	R1-104049	Discussion on enhanced ICIC schemes for control channels in HetNet	Fujitsu	Not treated
Yes	6.8.1	R1-104050	Impact of PDSCH RE muting/puncturing on macro-cell [illegible]	Fujitsu	Not treated
Yes	6.8	R1-104051	Co-channel Interference Aspects in Macro-Femto and Macro-Pico Deployments	CMCC	Not treated
Yes	6.3.4	R1-104052	Feedback reduction mechanism for MU-MIMO	HTC	Revised
Yes	6.2.3.1	R1-104053	Reduction of Blind Decodes for Carrier Aggregation	Research In Motion UK Limited	Not treated
Yes	6.2.3.1	R1-104054	Search Space for Carrier Aggregation	Research In Motion UK Limited	Noted
Yes	6.2.7	R1-104055	UCI Transmission in the Presence of UL-SCH Data	Research In Motion UK Limited	Noted
Yes	6.3.3.2	R1-104056	Support of DM RS Ports and Its Signaling for LTE-A MU-MIMO	Research In Motion UK Limited	Not treated
Yes	6.3.4	R1-104057	Pre-Assigned Companion Subsets for Feedback Reduction and 2-Stage Codebook Design	Research In Motion UK Limited	Not treated
Yes	6.3.4	R1-104058	Companion Subset Based PMI/CQI Feedback for LTE-A MU-MIMO	Research In Motion UK Limited	Not treated
Yes	6.4.4	R1-104059	Multiplexing Capacity for LTE-A PUCCH Format 2/2a/2b with Transmit Diversity	Research In Motion UK Limited	Not treated
Yes	6.5.2.1	R1-104060	Impact on PDCCH Loading for Aperiodic SRS Scheduling	Research In Motion UK Limited	Not treated
Yes	6.5.2.1	R1-104061	Performance Enhancement of Aperiodic SRS with Configurable Duration	Research In Motion UK Limited	Not treated

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Yes	6.3.4	R1-104062	On the design of two-matrix feedback framework for Rel-10	CHTTL	Noted
Yes	6.8.3	R1-104063	Effect of Serving Cell Association in Pico/Macro HetNet	CHTTL	Not treated
Yes	6.8.1	R1-104064	Further considerations on non-CA based enhanced ICIC	Ericsson, ST-Ericsson	Not treated
Yes	6.8.2	R1-104065	Downlink data performance with TDM-based interference coordination	Ericsson, ST-Ericsson	Not treated
Yes	6.8.3	R1-104066	Potential Performance of Range Expansion and PDCCH Interference Management	Kyocera	Not treated
Yes	5.2.1	R1-104067	UE Autonomous Secondary Carrier Deactivation in 4C-HSDPA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Noted
Yes	5.2.1	R1-104068	HS-SCCH Order and HS-DPCCH Robustness in 4C-HSDPA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Noted
Yes	5.2.1	R1-104069	Enhanced Serving cell Change in 4C-HSDPA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Noted
Yes	5.2.1	R1-104070	Fast Activation/Deactivation of Secondary Carriers for Energy Saving & Load Balancing in 4C-HSDPA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Noted
Yes	5.2.1	R1-104071	Further Discussion on Fast Primary Carrier Change in 4C-HSDPA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Noted
Yes	5.2.1	R1-104072	On 4C-HSDPA Cell Coverage	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Noted
Yes	6.1	R1-104073	Confirmation of UE behaviour in case of simultaneously-triggered SR, SRS and CQI	Alcatel-Lucent Shanghai Bell,	Revised
Yes	6.2.1	R1-104074	PCFICH	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Noted
Yes	6.2.2	R1-104075	PHICH resource allocation in LTE-A	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Not treated
Yes	6.2.3.1	R1-104076	Search Space sharing with CIF	Alcatel-Lucent Shanghai Bell,	Revised
Yes	6.2.3.2	R1-104077	Remaining Issues on CIF Configuration and Mapping	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Not treated
Yes	6.2.4.1	R1-104078	Comparison of PUCCH A/N multiplexing methods	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Revised
Yes	6.2.5	R1-104079	Clarification on power scaling	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Not treated
Yes	6.2.5	R1-104080	Way Forward on cross-carrier power control	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, etc	Not treated
Yes	6.2.5	R1-104081	Power control for multiple antennas	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Not treated
Yes	6.2.6	R1-104082	PUSCH resource allocation	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Revised
Yes	6.2.7	R1-104083	UCI on PUSCH	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Noted

Yes	6.3.1.3	R1-104084	Explicitly configured PRB bundling	Alcatel-Lucent Shanghai Bell,	Not treated
Yes	6.3.2.1	R1-104085	Comparison of CSI-RS patterns	Alcatel-Lucent Shanghai Bell,	Not treated
Yes	6.3.3.1	R1-104086	DCI formats for MU-MIMO	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Not treated
Yes	6.3.4	R1-104087	Performance evaluations of two-stage feedback proposals	Alcatel-Lucent Shanghai Bell,	Revised
Yes	6.3.4	R1-104088	Discussion of two-stage feedback proposals	Alcatel-Lucent Shanghai Bell,	Noted
Yes	6.3.4	R1-104089	Further evaluation of differential feedback in the context of the Rel-10 two-stage implicit feedback framework	Alcatel-Lucent Shanghai Bell,	Not treated
Yes	6.3.4	R1-104090	CQI/PMI reporting modes for two-stage feedback	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Noted
Yes	6.3.4	R1-104091	Further analysis of companion feedback performance and feedback signalling overhead reduction	Alcatel-Lucent Shanghai Bell,	Not treated
Yes	6.4.1	R1-104092	Further discussion of UL transmission modes and DCI format designs	Alcatel-Lucent Shanghai Bell,	Revised
Yes	6.4.2	R1-104093	Further discussions on UCI Multiplexing on PUSCH in case of SU-MIMO	Alcatel-Lucent Shanghai Bell,	Revised
Yes	6.4.3	R1-104094	Further discussions on PHICH mapping for UL SU-MIMO	Alcatel-Lucent Shanghai Bell,	Not treated
Yes	6.5.2.1	R1-104095	Remaining issues of dynamic aperiodic SRS	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Not treated
Yes	6.5.2.2	R1-104096	Summary of SRS enhancements	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Not treated
Yes	6.6.1	R1-104097	Type 1 Relay Un Configuration and HARQ operation	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Not treated
Yes	6.6.1	R1-104098	Un DM-RS Pattern for DL timing Case 3	Alcatel-Lucent Shanghai Bell,	Not treated
Yes	6.7	R1-104099	Techniques for improving UTDOA Performance with SRS-only scenario	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Noted
Yes	6.8.1	R1-104100	Control Channel Performance for Hetnet	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Not treated
No	6.8.1	R1-104101	Control Channel ICIC for non-CA HetNet Deployment	Alcatel-Lucent Shanghai Bell,	Withdrawn
Yes	6.8.1	R1-104102	Performance Evaluation for Power Control based on Femto Deployment	Alcatel-Lucent Shanghai Bell,	Noted
Yes	6.8.2	R1-104103	HetNet Rel-8/9 Data Channel Performance	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell,	Not treated

Yes	6.8.3	R1-104104	Cell Association for HetNet	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Not treated
Yes	6.8.2	R1-104105	Cognitive Interference Management for Pico-Macro	CEWiT	Not treated
Yes	6.8.2	R1-104106	Cognitive Interference Management for Femto-Macro	CEWiT	Not treated
Yes	6.8.2	R1-104107	Interference cancelling block modulation for spectrally effecient Heterogenous networks with flexible pico cell deployments	CEWiT	Not treated
Yes	5.2.1	R1-104108	Discussion on the remaining details of 4-carrier HSDPA	Nokia, Nokia Siemens Networks	Noted
Yes	5.2.1	R1-104109	Power saving solutions for 4C-HSDPA	Nokia Siemens Networks, Nokia, Qualcomm Incorporated	Revised
Yes	5.2.2	R1-104110	Draft 25.212 CR, introduction of 4C-HSDPA	Nokia, Nokia Siemens Networks	Noted
Yes	5.2.2	R1-104111	Draft 25.214 CR, introduction of 4C-HSDPA	Nokia, Nokia Siemens Networks	Noted
Yes	6.5.1.1	R1-104112	Uplink DMRS Resource Configuration for Rel-10	Ericsson, ST-Ericsson	Revised
Yes	6.2.3.3	R1-104113	On the need of PDCCH monitoring set	LG Electronics	Not treated
Yes	5.2.1	R1-104114	Timer based implicit deactivation for 4C-HSDPA	Huawei	Not treated
Yes	6.3.3.2	R1-104115	DMRS indication in DL enhanced Multiple antenna transmission	CMCC	Not treated
Yes	6.3.2.1	R1-104116	Further Considerations on CSI-RS Pattern Design	CMCC	Noted
Yes	6.6.1	R1-104117	Un DM-RS	CMCC	Not treated
Yes	6.6.1	R1-104118	Un R-PDCCH design	CMCC	Not treated
Yes	6.8	R1-104119	Discussion on one solution of eICIC interference management for TDD	CMCC	Not treated
Yes	6.3.4	R1-104120	Extending Rel.8/9 CSI Feedback Schemes for Rel.10	Texas Instruments	Noted
Yes	6.5.2.2	R1-104121	SRS Assignment for UL MIMO	Mitsubishi Electric	Not treated
Yes	6.3	R1-104122	Cooperative Multipoint Performance Evaluation Based on Simulation and Trial Measurements in Easy-C Project	Vodafone	Not treated
Yes	6.3.4	R1-104123	Rationale for mandating simulation of 4Tx Widely-Spaced Antenna Configuration for LTE-A MU-MIMO	AT&T	Revised
Yes	6.1	R1-104124	36.212 Draft CR on Soft Buffer Size Determination for PMCH	Qualcomm Incorporated	Noted - Revised
Yes	6.8.3	R1-104125	Downlink performance evaluation for cell selection in Macro+Hotzone deployment of HetNets	Potevio	Not treated

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Yes	6.8.1	R1-104126	FDM Range Extension in Open-access Heterogeneous Networks	Motorola	Not treated
Yes	6.2.4.1	R1-104127	Evaluation on A/N multiplexing schemes	ZTE	Noted
Yes	6.2.4.1	R1-104128	Link-level evaluation of PUCCH proposals for Carrier Aggregation	InterDigital Communications, LLC	Noted
Yes	6.4.3	R1-104129	PHICH assignment for UL SU-MIMO	ZTE	Noted
Yes	6.3.4	R1-104130	On the importance of successive feedback refinement for cross-polarized antenna configurations	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Revised
Yes	6.9	R1-104131	LTE Rel-10 UE categories	Nokia, Nokia Siemens Networks	Noted
Yes	6.6.1	R1-104132	UL/DL HARQ timing for backhaul	Panasonic	Not treated
Yes	6.6.1	R1-104133	Comparison of UL/DL HARQ for backhaul	Panasonic	Not treated
Yes	6.3.4	R1-104134	Two-component Feedback Design and Codebooks	Motorola	Noted
Yes	6.1	R1-104135	Confirmation of UE behaviour in case of simultaneously-triggered SR, SRS and CQI	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Noted
Yes	6.3.4	R1-104136	On the importance of successive feedback refinement for cross-polarized antenna configurations	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Intel	Revised
Yes	6.9	R1-104137	UE categories for Rel-10 evolution of LTE	Vodafone Group	Revised
Yes	3	R1-104138	Final report of RAN1#61 meeting	MCC Support	Noted - Revised
Yes	6.3.4	R1-104139	Multiple PMI feedback for dynamic SU/MU switching	Texas Instruments	Not treated
Yes	6.2.4.1	R1-104140	ACK/NAK Multiplexing Simulation Assumptions in Rel-10	CATT, LG Electronics, Qualcomm	Not treated
Yes	5	R1-104141	Minutes from RAN1#61bis HSPA sessions	Incorporated ZTE HSPA session	Endorsed
Yes	5.5	R1-104142	Discussion on measurement in distributed antenna scenario for 1.28Mcps TDD	ZTE	Noted
Yes	5.1.2	R1-104143	Simulation assumptions HS-DSCH transmission in CELL_PCH or URA_PCH state for 1.28Mcps TDD	TD Tech	Noted - Revised
Yes	5.3	R1-104144	Draft LS on RAN1's agreements on LCR TDD MC-HSUPA	CATT	Noted - Revised
Yes	5.1.1	R1-104145	Draft LS to RAN2 and RAN3 on Support for different HS-SCCHs in contiguous TTIs in CELL_FACH	Ericsson	Noted - Revised
No	5.1.1	R1-104146	25.214 CR0605R4 (Rel-7, F) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH. CELL_PCH and URA_PCH states	Infineon	Withdrawn

No	5.1.1	R1-104147	25.214 CR0606R3 (Rel-8, A) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH. CELL_PCH and URA_PCH states	Infineon	Withdrawn
No	5.1.1	R1-104148	25.214 CR0607R3 (Rel-9, A) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH. CELL_PCH and URA_PCH states	Infineon	Withdrawn
Yes	5.1.1	R1-104149	25.214 CR0602R3 (Rel-7, F) Clarification of the CQI definition when the UE is configured in MIMO mode	Huawei, Qualcomm Incorporated, InterDigital Communication LLC, Ericsson, ST-Ericsson, Nokia	Noted
Yes	5.1.1	R1-104150	25.214 CR0603R3 (Rel-8, A) Clarification of the CQI definition when the UE is configured in MIMO mode	Huawei, Qualcomm Incorporated, InterDigital Communication LLC, Ericsson, ST-Ericsson, Nokia	Noted
Yes	5.1.1	R1-104151	25.214 CR0604R3 (Rel-9, A) Clarification of the CQI definition when the UE is configured in MIMO mode	Huawei, Qualcomm Incorporated, InterDigital Communication LLC, Ericsson, ST-Ericsson, Nokia	Noted
Yes	5.1.1	R1-104152	25.212 CR0287R1 (Rel-9, F) Clarification of uplink f	ZTE	Agreed
Yes	5.1.1	R1-104153	25.213 CR0107R1 (Rel-9, F) Clarification of uplink f	ZTE	Agreed
Yes	5.1.1	R1-104154	25.214 CR0612 (Rel-7, F) Clarification of E-AGCH/E-RGCH monitoring in a CM gap when DL_DRX_Active is TRUE	Qualcomm Incorporated	Agreed
Yes	5.1.1	R1-104155	25.214 CR0613 (Rel-8, A) Clarification of E-AGCH/E-RGCH monitoring in a CM gap when DL_DRX_Active is TRUE	Qualcomm Incorporated	Agreed
Yes	5.1.1	R1-104156	25.214 CR0614 (Rel-9, A) Clarification of E-AGCH/E-RGCH monitoring in a CM gap when DL_DRX_Active is TRUE	Qualcomm Incorporated	Agreed
Yes	5.6	R1-104157	On deploying DC-HSDPA UEs in Single Carrier N	Qualcomm	Noted
No		R1-104158	void	void	Not treated
Yes	5.2.2	R1-104159	Minutes from RAN1#61bis 4C-HSDPA drafting session	HSPA session chairman	Endorsed
Yes	6.8	R1-104160	Email summary on WF on Identification of Co-Channel problem and needs in Macro-Pico	CATT	Noted
Yes	6.3.4	R1-104161	Feedback reduction mechanism for MU-MIMO	HTC	Not treated
Yes	6.3.1.1	R1-104162	Way forward on length-4 OCC mapping for DL DM RS	Ericsson, ST-Ericsson, CATT, Mitsubishi, Nokia, Nokia Siemens Networks, NTT DOCOMO, Panasonic	Noted

Yes	6.4.2	R1-104163	Further discussions on UCI Multiplexing on PUSCH in case of SU-MIMO	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Noted
Yes	6.3.4	R1-104164	Way Forward on 8Tx Codebook for Rel.10 DL MIMO	Texas Instruments, Nokia, Nokia Siemens Networks, Ericsson, ST-Ericsson, NTT DoCoMo	Not treated
Yes	6.4.2	R1-104165	Clarification for HARQ-ACK/RI Replica on PUSCH with SU-MIMO	Sharp	Noted
Yes	6.8.1	R1-104166	Performance analysis of PDCCH interference mitigation techniques in Outdoor Hotzone Het-Net	ZTE	Not treated
Yes	6.4.2	R1-104167	UCI Multiplexing on PUSCH with MIMO Transmission	ZTE	Noted
Yes	4	R1-104168	LS on SCell activation/deactivation	RAN2, NTT DoCoMo	Noted
Yes	6.3.4	R1-104169	WF on Rel. 10 feedback for 4Tx	Samsung, ALU, ALU Shanghai Bell, Huawei, Intel, Marvell, ZTE, RIM, Pantech, Qualcomm, Fujitsu, CATT, Orange, ETRI, AT&T, NEC, Toshiba, Philips, Panasonic,	Noted
Yes	5.2.2	R1-104170	25.211 CR0284R1 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm Incorporated, Nokia Siemens Networks, Nokia, Ericsson, ST-Ericsson, Huawei, Interdigital, Samsung, ZTE	Endorsed
Yes	5.2.2	R1-104171	25.212 CR0288R1 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm Incorporated, Nokia Siemens Networks, Nokia, Ericsson, ST-Ericsson, Huawei, Interdigital, Samsung, ZTE	Endorsed
Yes	5.2.2	R1-104172	25.213 CR0108R1 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm Incorporated, Nokia Siemens Networks, Nokia, Ericsson, ST-Ericsson, Huawei, Interdigital, Samsung, ZTE	Endorsed

Yes	5.2.2	R1-104173	25.214 CR0611R1 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm Incorporated, Nokia Siemens Networks, Nokia, Ericsson, ST-Ericsson, Huawei, Interdigital, Samsung, ZTE	Noted - Revised
Yes	5.2.2	R1-104174	25.214 CR0611R2 (Rel-10, F) Introduction of 4C-HSDPA	Qualcomm Incorporated, Nokia Siemens Networks, Nokia, Ericsson, ST-Ericsson, Huawei, Interdigital, Samsung, ZTE	Endorsed
Yes	5.2.2	R1-104175	[DRAFT] LS on Draft RAN1 CRs for 4C-HSDPA	Qualcomm	Noted - Revised
Yes	6.3.4	R1-104176	Performance evaluations of Rel.10 feedback framework for 8Tx	Samsung	Not treated
Yes	6.3.1.2	R1-104177	Way forward on DM-RS pattern for extended CP	CMCC, Ericsson, LG Electronics, NEC, Nokia, Nokia Siemens Networks, NTT DoCoMo, ST-Ericsson, Texas	Noted
Yes	6.3.3.2	R1-104178	Summary of email discussion on way forward for Rel-10 MU-MIMO	Huawei	Noted
Yes	5.2.1	R1-104179	Power saving solutions for 4C-HSDPA	Nokia, Nokia Siemens Networks, Huawei, Qualcomm, ZTE, InterDigital	Noted
Yes	5.1.1	R1-104180	Clarification of E-AGCH/E-RGCH monitoring in a CM gap when DL_DRX_Active is TRUE	Qualcomm Incorporated	Noted
Yes	5.2.1	R1-104181	Discussion on HS-SCCH order reliability	Huawei	Noted
Yes	3	R1-104182	Selected highlights from RAN#48	RAN1 Chairman	Noted
Yes	3	R1-104183	Final report of RAN1#61 meeting	MCC Support	Approved
Yes	6.3.4	R1-104184	Rationale for mandating simulation of 4Tx Widely-Spaced Antenna Configuration for LTE-A MU-MIMO	AT&T	Noted
Yes	6.1	R1-104185	36.306 Draft CR (Rel-9, F) Clarification of MBMS UE capability	Panasonic, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Ericsson, ST-Ericsson, Huawei, KDDI, Samsung, Orange, Nokia, Nokia	Noted - Revised

Yes	6.1	R1-104186	Draft LS on MBMS UE capability	Panasonic, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Ericsson, ST-Ericsson, Huawei, KDDI, Samsung, Orange	Noted - Revised
Yes	6.1	R1-104187	36.212 CR0099 (Rel-9, F) Clarify soft buffer size determination for MCH	Qualcomm Inc., Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Panasonic, NEC, Ericsson, ST-Ericsson, Nokia	Agreed
Yes	6.1	R1-104188	LS on the description of multi-user MIMO in feature	RAN1, Panasonic	Agreed
Yes	6.2.3.1	R1-104189	The actual number of blind decodes in LTE-A	Huawei	Not treated
Yes	6.2.3.2	R1-104190	Search Space sharing with CIF	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Noted
Yes	6.3.4	R1-104191	DL codebook for 8TX	Huawei	Not treated
Yes	6.2.4.1	R1-104192	Combined Component Aggregated HARQ A/N	Sharp	Not treated
Yes	6.9	R1-104193	UE categories for Rel-10 evolution of LTE	Vodafone Group, Orange	Noted
Yes	6.2.4.1	R1-104194	Comparison of PUCCH A/N multiplexing methods	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Noted
Yes	6.3.4	R1-104195	On the importance of successive feedback refinement for cross-polarized antenna configurations	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, AT&T, Intel, Orange, NEC	Noted
Yes	6.3.4	R1-104196	Consideration on Signaling for Two-component Feedback	ZTE	Noted
Yes	5.4	R1-104197	Control channel design in MU-MIMO for LCR TDD	CATT, ZTE	Noted
Yes	6.3.4	R1-104198	Performance evaluations of two-stage feedback proposals	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Noted
Yes	6.3.2.1	R1-104199	Intra-cell CSI-RS Design	NTT DOCOMO	Noted
Yes	5.2.1	R1-104200	HS-DPCCH design for 3C-HSDPA without MIMO configuration	ZTE	Noted
Yes	6.3.1.1	R1-104201	OCC mapping for DM-RS rank 5~8	Panasonic	Noted

Yes	6.3.2.2	R1-104202	Study on efficient power usage of muted off REs for CSI-RS	Samsung	Noted
Yes	6.5.1.1	R1-104203	Uplink DMRS Resource Configuration for Rel-10	Ericsson, ST-Ericsson	Not treated
Yes	6.3.2.1	R1-104204	CSI RS pattern design	Huawei	Noted
Yes	6.3.2.1	R1-104205	Joint Proposal on CSI-RS Patterns with CDM-F OCC=2	Huawei, CMCC, Intel, ITRI, CHTTL	Not treated
Yes	6.3.3.2	R1-104206	Way Forward on Rel-10 DL MU MIMO	Broadcom, CATT, CATR, CEWiT, CHTTL, CMCC, Ericsson, ST-Ericsson, Fujitsu, HTC, HT mMobile, ITRI, LG Electronics, MediaTek, NewPostCom, Nokia, Nokia Siemens Networks, NTT	Noted
Yes	6.3.1.1	R1-104207	WF on DM RS OCC Mapping	AT&T, Broadcom, CeWit, CHTTL, ETRI, HTC, HT `mMobile, I2R, III, LG Electronics, MediaTek, Motorola	Noted - Revised
Yes	6.3.1.1	R1-104208	Discussion on DMRS OCC-4 Mapping	Samsung	Noted
Yes	6.8.2	R1-104209	Performance evaluation of static Home eNB ICIC function based on frequency domain silencing	Samsung	Not treated
Yes	6.3.1.3	R1-104210	Way Forward on DM-RS PRB Bundling configuration	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CHTTL, Huawei, HT mMobile, III, ITRI, Marvell, Motorola	Not treated
Yes	6.3.2.1	R1-104211	Way Forward for CSI RS	LG Electronics, NTT-DoCoMo, Nokia, Nokia Siemens Networks, Ericsson, ST-Ericsson, Samsung, Texas Instruments, NEC, ETRI, Pantech, Sharp	Revised

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Yes	6.3.2.1	R1-104212	Way forward on CSI-RS patterns	Qualcomm, CMCC, ZTE, Potevio, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Huawei	Not treated
Yes	5.2.1	R1-104213	HS-DPCCH Configuration for 3C without MIMO	Qualcomm Incorporated	Noted
Yes	6.8	R1-104214	Co-channel Macro cell and Pico cell deployment: way forward	Texas Instruments, Alcatel-Lucent Shanghai Bell, Alcatel-Lucent, Nokia, Nokia Siemens	Noted
Yes	6.2.4.1	R1-104215	Way forward on CA PUCCH	CATR, CATT, CMCC, Ericsson, InterDigital, ITRI, LG Electronics, LG-Nortel, MediaTek, Potevio, Sharp, ST-Ericsson	Noted
Yes	6.4.2	R1-104216	UCI Multiplexing on PUSCH in UL-MIMO Transmissions	Motorola	Noted
Yes	6.2.4.1	R1-104217	Way forward on UL HARQ-ACK transmission	ETRI, Huawei, Motorola, Nokia, Nokia Siemens Networks, Pantech, Qualcomm, RIM, Samsung, ZTE	Noted
Yes	6.8.1	R1-104218	PDCCH Interference Mitigation framework in LTE-A	Intel Corporation (UK) Ltd, Kyocera, KDDI, Philips, ITRI, Fujitsu, MediaTek, Potevio, New	Not treated
Yes	6.5.1.1	R1-104219	Way Forward on CS and OCC signaling for UL DMRS	Panasonic, Samsung, Motorola, NTT DOCOMO, NEC, Pantech	Noted
Yes	6.6.1	R1-104220	Way forward on Un PUCCH resource in Rel-10	CATT, Nokia, Nokia Siemens Networks, Panasonic, Ericsson, ST-Ericsson, LG Electronics, Huawei, Motorola, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, HTC, ETRI, ITRI,	Noted
Yes	6.8.1	R1-104221	Way forward on eICIC for non-CA based HetNets	AT&T, CMCC, CATT, CHTTL, NTT DoCoMo, LGE, Philips, Qualcomm	Revised

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Yes	6.8.1	R1-104222	Way forward on eICIC for non-CA based HetNets	AT&T, CMCC, CATT, CHTTL, NTT DoCoMo, LGE, Philips, Qualcomm, Samsung, Verizon	Revised
Yes	6.6.1	R1-104223	Way forward on R-PDCCH with CRS	ZTE, Huawei, ETRI, RIM, Qualcomm Inc., Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, LGE	Noted
Yes	6.2.6	R1-104224	PUSCH resource allocation	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Not treated
Yes	6.2.6	R1-104225	Comparison of Non-contiguous PUSCH resource allocation techniques	Motorola	Noted
Yes	6.4.1	R1-104226	Further discussion of UL transmission modes and DCI format designs	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Not treated
Yes	6.8.1	R1-104227	Way forward on eICIC for non-CA based HetNets	AT&T, CMCC, CATT, CHTTL, NTT DoCoMo, LGE, Orange, Philips, Qualcomm, Samsung	Noted
Yes	6.5.1.1	R1-104228	Conveying OCC for PUSCH transmissions	Qualcomm Incorporated	Not treated
Yes	6.4.1	R1-104229	UL grants for MIMO transmissions	Qualcomm Incorporated	Not treated
Yes	6.4.1	R1-104230	Way forward on TB Disabling	Huawei, Texas Instruments, Nokia, Nokia Siemens Networks, Motorola, CATT, Samsung	Not treated
Yes	6.5.2.1	R1-104231	Proposal for UL sounding resource extension	Huawei, Samsung, RIM, Potevio, HTC, CHTTL, Fujitsu, Mitsubishi, Asustek	Not treated
Yes	6.2.1	R1-104232	DRAFT LS on Signaling of PDSCH Starting Position for Cross-CC Scheduling	Nokia Siemens Networks, Nokia	Noted - Revised
Yes	6.2.3.2	R1-104233	Way forward on handling of overlap between search spaces	LGE, Philips, Nokia, Nokia Siemens Networks, Huawei, RIM, ETRI, Pantech, ZTE, Panasonic, Ericsson, ST-Ericsson, Samsung, CATT, Qualcomm	Agreed

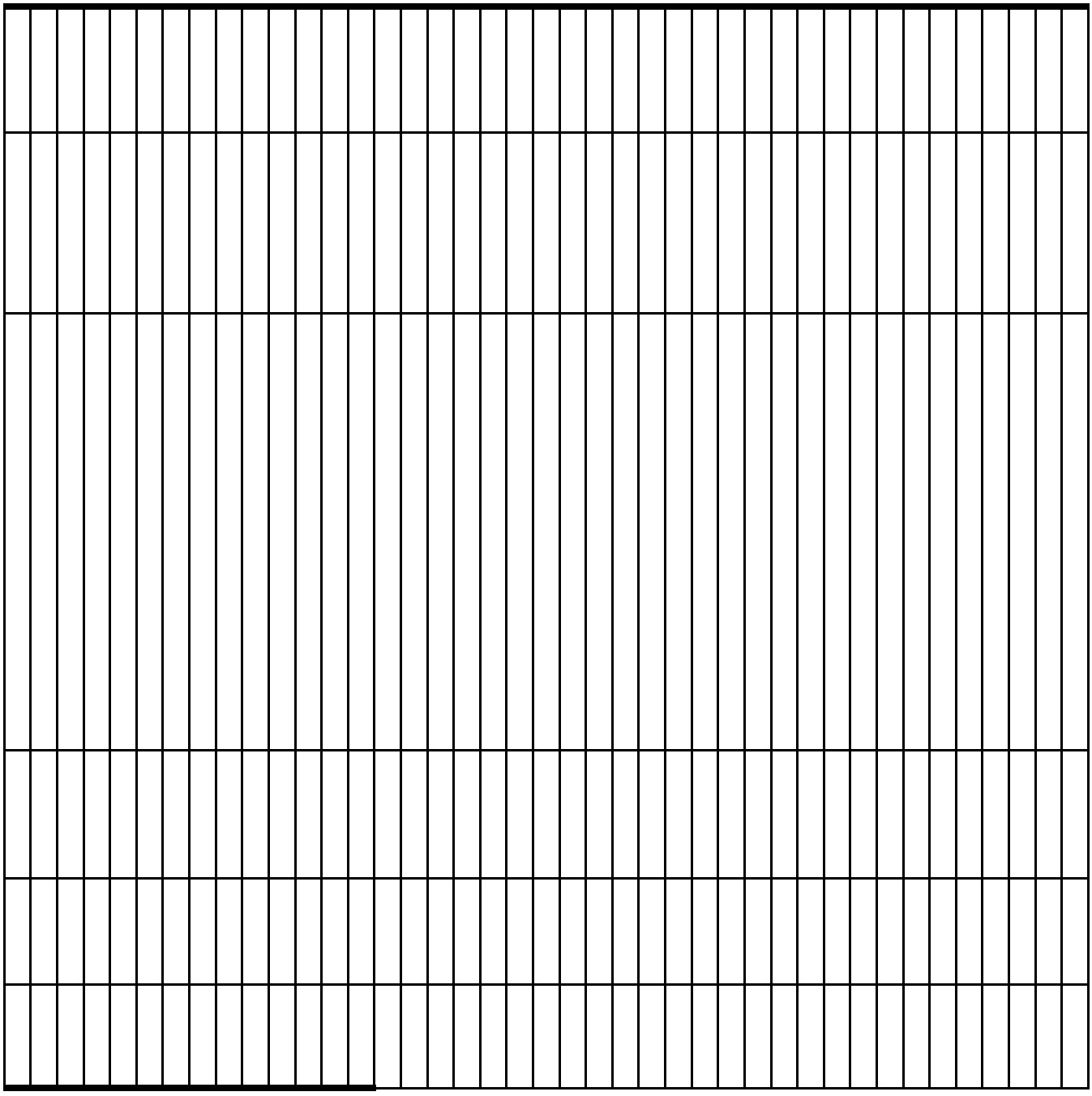
Yes	6.3.4	R1-104234	Way Forward on CSI Feedback for Rel.10 DL MIMO	Texas Instruments, LG Electronics, Nokia, Nokia Siemens Networks, NTT DoCoMo	Noted
Yes	6.6.1	R1-104235	Way forward on R-PDCCH with CRS	Nokia, Nokia Siemens Networks, CATT, CMCC, Motorola, Ericsson, ST-Ericsson	Revised
Yes	6.6.1	R1-104236	Way forward on R-PDCCH with CRS	Nokia, Nokia Siemens Networks, CATT, CMCC, Motorola, Ericsson, ST-Ericsson, Alcatel-Lucent, Alcatel-	Noted
Yes	5.2.1	R1-104237	Performance evaluation of proposed codebooks for 3C-HSDPA without MIMO configuration	ZTE	Noted
Yes	6.8	R1-104238	eICIC Chairman's note	Ad Chair (NTT DoCoMo)	Endorsed
Yes	6.3	R1-104239	DL RS Chairman's note	Ad Chair (NTT DoCoMo)	Endorsed
Yes	6.4	R1-104240	Summary of UL MIMO and UL RS Ad-hoc Session	Ad Chair (Samsung)	Endorsed
Yes	6.3.4	R1-104241	Way Forward on Rel. 10 4Tx feedback framework	Samsung, Huawei, ALU, Alcatel-Lucent Shanghai Bell, Pantech, NEC, Intel, ZTE, Fujitsu, ETRI, Marvell, InterDigital	Noted
Yes	5.2.2	R1-104242	LS on Draft RAN1 CRs for 4C-HSDPA	RAN1, Qualcomm	Agreed
Yes	5.1.1	R1-104243	LS to RAN2 and RAN3 on Support for different HS-SCCHs in contiguous TTIs in CELL_FACH	RAN1, Ericsson	Agreed
Yes	6.3.4	R1-104244	Way-forward on Rel. 10 CSI Feedback signaling	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, ASUSTek, CHTTL, CMCC,ETRI, Fujitsu, HTC, Huawei, III, Intel, Marvell,	Noted
Yes	6.8.1	R1-104245	Lightly-scheduled description for Macro-Femto discussion	Motorola	Noted
No	6.8.1	R1-104246	Input for Macro-Femto coordination	Alcatel-Lucent	Withdrawn
Yes	6.8.1	R1-104247	Concrete proposal for frequency domain solution	Huawei	Noted

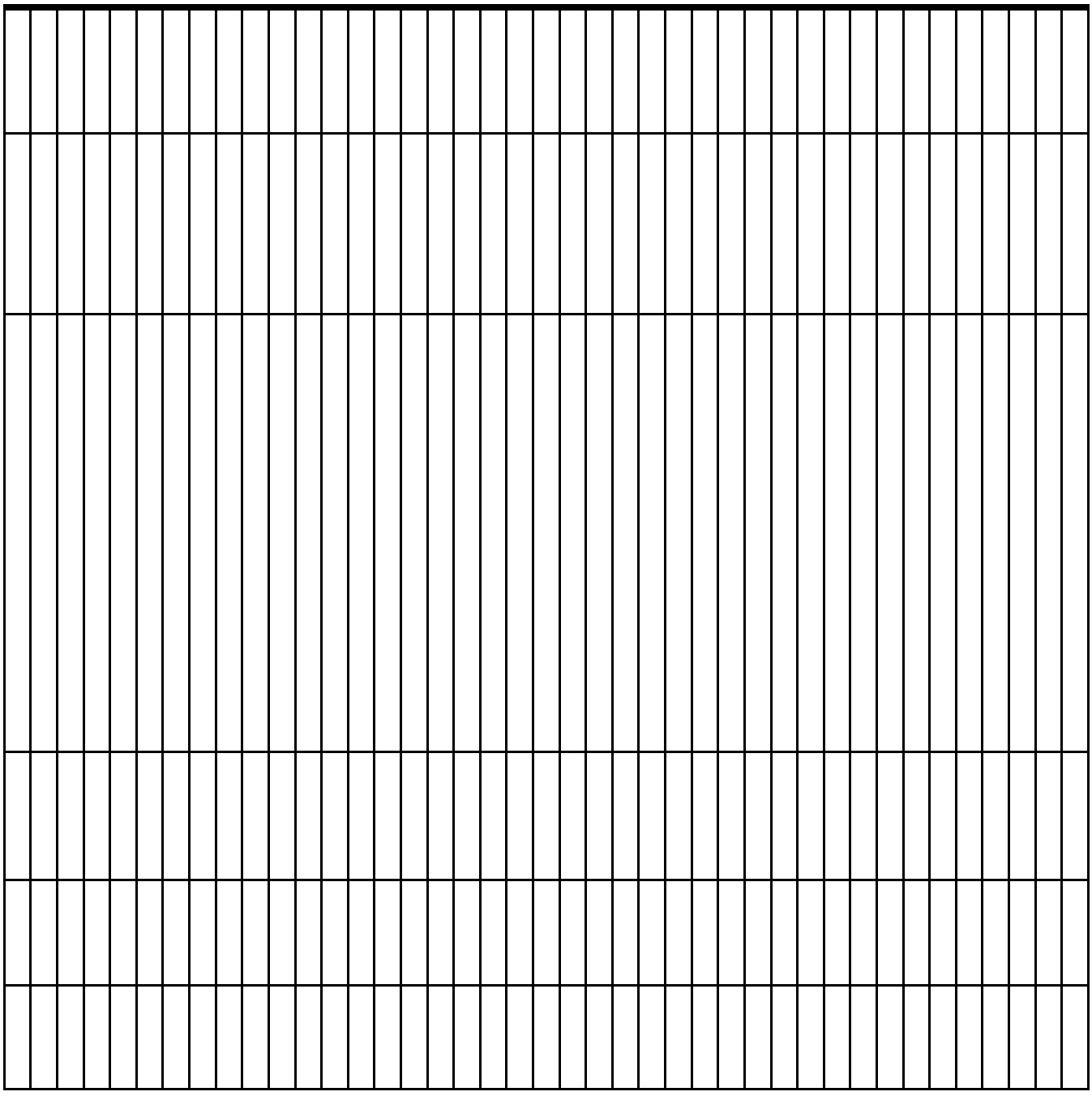
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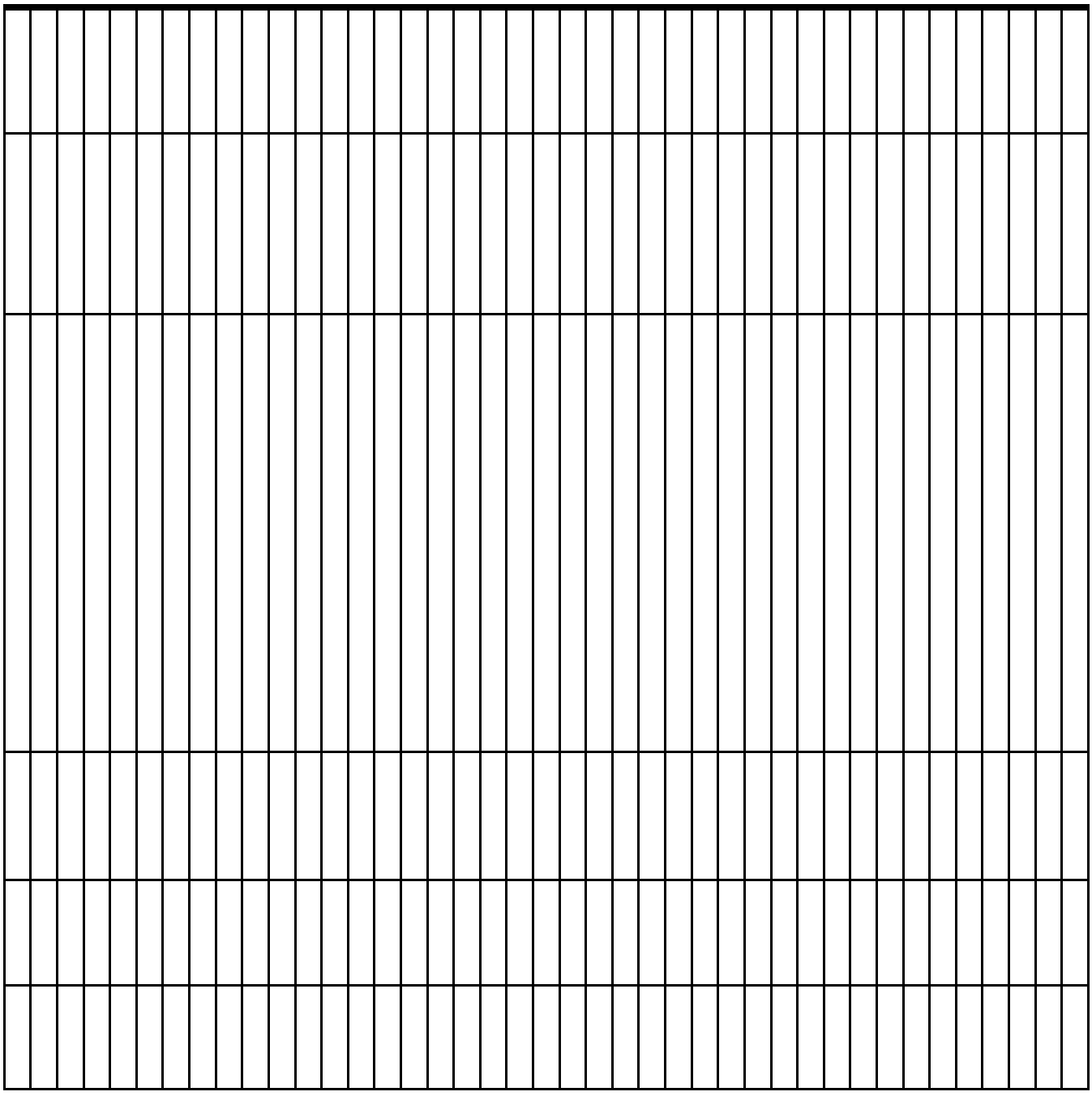
Yes	6.3.2.1	R1-104248	Way Forward for CSI RS	LG Electronics, Nokia, Nokia Siemens Networks, NTT DoCoMo, Ericsson, ST-Ericsson, Texas Instruments, Qualcomm, LG-Nortel, NEC	Revised
Yes	6.5.2.1	R1-104249	Proposal on aperiodic SRS features	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT, Ericsson, ST-Ericsson, Huawei, ITRI, KDDI, LG Electronics, MediaTek, Motorola, Nokia, Nokia Siemens Networks, Panasonic, Qualcomm, Research	Noted
Yes	6.2.7	R1-104250	Proposal on the agreement for UCI transmission	Panasonic and co....	Noted
No	6.3.2.1	R1-104251	Proposal on CSI-RS Pattern	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATR, CATT, CMCC, CHTTL, Huawei, HTC, HTmMobile, Media	Withdrawn
Yes	6.3.4	R1-104252	Proposal on Calibration Error Model for Evaluations	Qualcomm	Noted
Yes	6.8.1	R1-104253	eICIC solutions details	Qualcomm Incorporated	Revised
Yes	6.3.1.1	R1-104254	Way forward on DL DMRS OCC mapping in Rel-10	CATT, Ericsson, ST-Ericsson, I2R, Mitsubishi, NEC, Nokia, Nokia Siemens Networks, NTT DOCOMO, Panasonic, Potevio, Qualcomm	Noted
Yes	6.3.1.1	R1-104255	Way forward on DL DMRS OCC mapping	AT&T, Broadcom, CHTTL, ETRI, HTC, HTmMobile, III, LG Electronics, MediaTek, Pantech, Research In Motion	Noted
Yes	6.8.1	R1-104256	eICIC solutions details	Qualcomm Incorporated	Noted

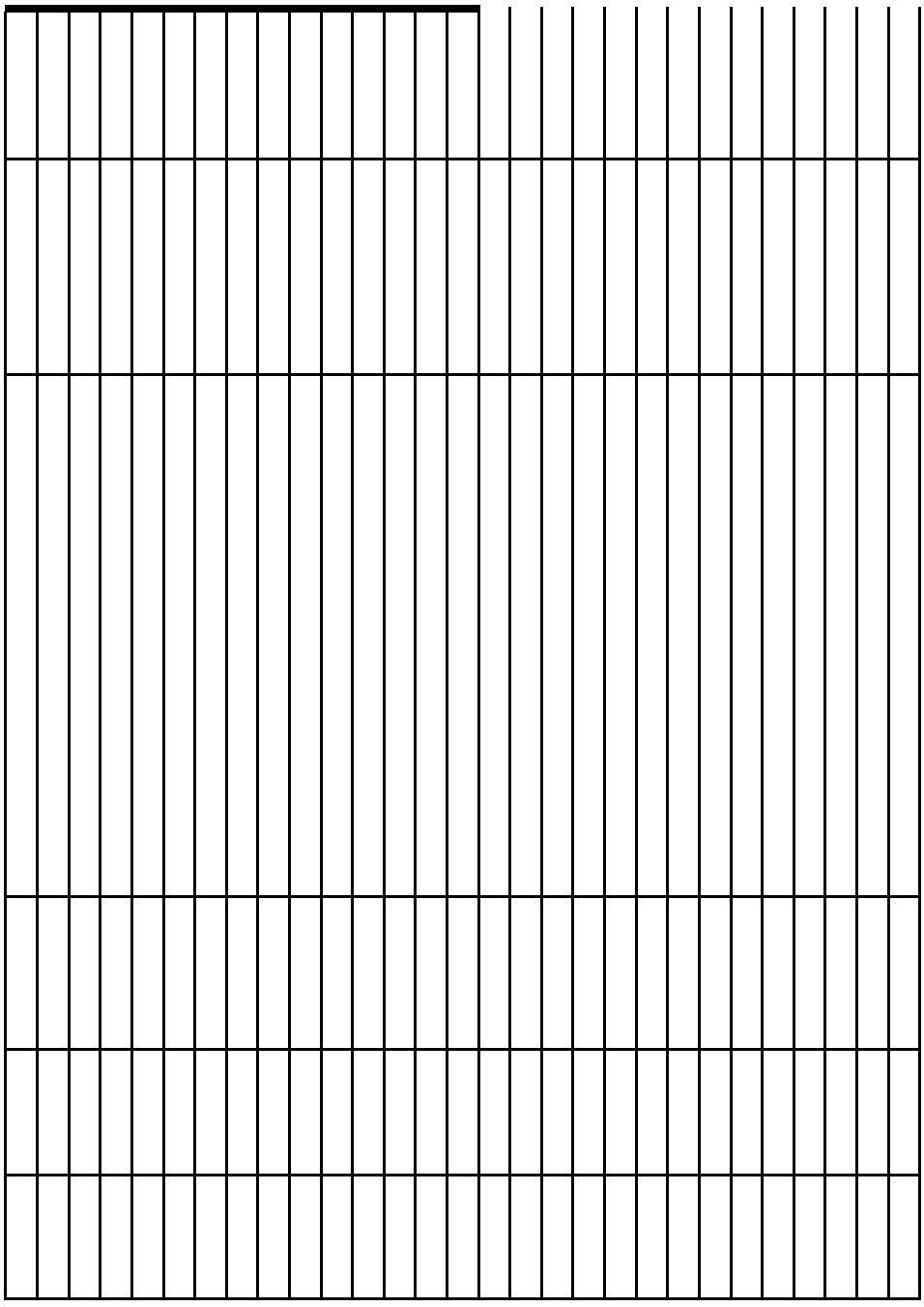
Yes	5.1.2	R1-104257	Link level Simulation assumption of HS-DSCH transmission in Enhanced CELL_PCH or URA_PCH for 1.28Mcps TDD	TD Tech	Agreed
Yes	5.3	R1-104258	LS on RAN1's agreements on LCR TDD MC-HSUPA	RAN1, CATT	Agreed
Yes	6.3.4	R1-104259	Way Forward on CSI Feedback for Rel.10 DL MIMO	Texas Instruments, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT, Ericsson, Huawei, Marvell, NEC, Nokia, Nokia Siemens Networks, NTT DoCoMo, Panasonic,	Noted
Yes	6.1	R1-104260	36.306 Draft CR (Rel-9, F) Clarification of MBMS UE capability	Panasonic, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Ericsson, ST-Ericsson, Huawei, KDDI, Samsung, Orange, Nokia, Nokia	Endorsed
Yes	6.1	R1-104261	LS on MBMS UE capability	RAN1, Panasonic	Agreed
Yes	6.2.1	R1-104262	DRAFT LS on Signaling of PDSCH Starting Position for Cross-CC Scheduling	Nokia Siemens Networks	Noted - Revised
Yes	6.3.2.1	R1-104263	Harmonized proposal for CSI RS pattern	LG Electronics, NTT DoCoMo, CMCC, Qualcomm Inc., Ericsson, ST-Ericsson, Texas Instruments, Nokia, Nokia Siemens Networks, Motorola, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATR, CATT, CHTTL,	Agreed
Yes	4	R1-104264	LS on CIF values	RAN2, Qualcomm	Noted
Yes	4	R1-104265	Per UE PHR related questions	RAN2, MediaTek	Noted
Yes	4	R1-104266	LS on status of RAN2 decisions on CA	RAN2, Alcatel-Lucent	Noted
Yes	6.2.1	R1-104267	LS on Signaling of PDSCH Starting Position for Cross-CC Scheduling	RAN1, Nokia Siemens Networks	Agreed

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Appendix E

3GPP_TSG_RAN_WG1 Archives
June 2010, Week 4

New in LISTSERV 17.0

3GPP_TSG_RAN_WG1@LIST.ETSI.ORG

Options: Use Proportional Font
Show Text Part by Default
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Message: [<< First] [< Prev] [Next >] [Last >>]
Topic: [<< First] [< Prev] [Next >] [Last >>]
Author: [<< First] [< Prev] [Next >] [Last >>]

Subject: Texas Instruments' contributions for RAN1-61bis.
From: "Chandrasekhar, Vikram" <vikram.chandrasekhar@TI.COM>
Reply To: Chandrasekhar, Vikram
Date: Tue, 22 Jun 2010 00:08:16 -0500
Content-Type: multipart/mixed
Parts/Attachments: text/plain (1353 bytes) , text/html (27 kB) , R1-103694.zip (47 kB) , R1-103695.zip (96 kB) , R1-103696.zip (113 kB) , R1-103697.zip (73 kB) , R1-103698.zip (49 kB) , R1-103699.zip (26 kB) , R1-103700.zip (26 kB) , R1-103701.zip (63 kB) , R1-103704.zip (27 kB) , R1-103705.zip (37 kB) , R1-103706.zip (47 kB) , R1-103708.zip (116 kB) , R1-103709.zip (55 kB) , R1-103711.zip (22 kB) , R1-103712.zip (21 kB) , R1-103713.zip (80 kB)

Dear all

Texas Instruments' contributions are attached.

Thank you,
Vikram Chandrasekhar.

6.2.7	Discussion,Decision	R1-103694	UCI Transmission on PUSCH for Carrier Aggregation
6.3.1.3	Discussion/Decision	R1-103695	Remaining details on PRB bundling size
6.3.2.1	Discussion/Decision	R1-103696	CSI-RS patterns for LTE-Advanced
6.3.2.2	Discussion/Decision	R1-103697	PDSCH muting for inter-cell CSI estimation: Rel-8 UE performance
6.3.2.2	Discussion/Decision	R1-103698	PDSCH muting: N-MSE for inter-cell CSI estimation
6.3.3.1	Discussion/Decision	R1-103699	On MU-MIMO transparency in Rel-10
6.3.3.2	Discussion/Decision	R1-103700	On DMRS dimensioning of MU-MIMO in Rel-10
6.3.4	Discussion/Decision	R1-103701	8Tx Codebook Design
6.3.5	Discussion/Decision	R1-103704	DL MIMO transmission modes in Rel-10
6.4.1	Discussion/Decision	R1-103705	Remaining Issues on UL MIMO Transmission Mode and DCI Format Design
6.4.2	Discussion/Decision	R1-103706	Remaining Issues on UCI Multiplexing for UL MIMO
6.4.5	Discussion/Decision	R1-103708	Specifying Basic Building Blocks of UL Multi-Antenna Transmission
6.4.5	Discussion/Decision	R1-103709	Precoder selection for non-adaptive HARQ UL SU-MIMO
6.5.2.1	Discussion,Decision	R1-103711	Outstanding issues on dynamic aperiodic SRS
6.5.2.2	Discussion,Decision	R1-103712	Increasing sounding resources for Rel-10
6.8.1	Discussion,Decision	R1-103713	Views on PDCCH interference mitigation for het-nets

ATOM RSS1 RSS2

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Appendix F

3GPP TSG RAN WG1 Meeting #61bis
Dresden, Germany, 28 June – 2 July, 2010

R1-~~104138~~104183

Agenda item 3

Title: Final Report of 3GPP TSG RAN WG1 #61 ~~v2~~v3.0.0 (Montreal, Canada, 10th – 14th May, 2010)

Document for: Approval

Source: MCC Support



Fact Summary

Meeting: 3GPP TSG RAN WG1 #61

Dates: 10th through 14th May, 2010

Venue: Hyatt Regency Montreal – Canada

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Main facts summary

3GPP TSG WG RAN1 #61 meeting, hosted by RIM took place at the Hyatt Regency Montreal Hotel in Montreal, Canada.
The meeting started at 9:08 on Monday 10th May and finished at 17:00 on Friday 14th May 2010.
The number of attending delegates was 205.

The week was scheduled as follows:

- Monday: Common session on Agenda items 1, 2, 3, 4, 6.1 (LTE CRs), 6.7 (Net.Pos), 6.9 (UE cat) in the morning session. Common session on Agenda item 6.2.5 (UL Power Control) in the afternoon session.
- Tuesday: Main session on Agenda item 6.2.6 (PUSCH Resource allocation), 6.2.1 (PCFICH) and 6.2.3 (PDCCH) chaired by Matthew Baker. HSPA parallel session on Agenda items 5.1.1, 5.1.2 (CRs), 5.3, 5.4, 5.6 (TDD HSPA) and Energy saving (AI 5.5) chaired by Johan Bergman.
- Wednesday: Early session on AI 6.7 (Net.Pos) to discuss further simulation assumptions. Parallel session dedicated to Downlink RS (AIs 6.3.1 and 6.3.2) chaired by Tetsushi Abe on one hand, remaining HSPA issues on 4-carrier HSDPA (AI 5.2) and AI 5.7 chaired by Matthew Baker on the other hand.
- Wednesday following afternoon coffee break: Continued discussion on DL RS on one hand and session dedicated to eICIC on the other hand (AI 6.8) chaired by Matthew Baker. Session to review the TPs on Energy saving for UMTS SI chaired by Johan Bergman.
- Thursday: Early session on AI 6.7 (Net.Pos) chaired by Tetsushi Abe. Parallel sessions on Agenda items 6.3.4 (Feedback) and 6.6 (Relay) chaired by Matthew Baker and Agenda items 6.4.1 to 6.5.2 (UL RS and UL MIMO) chaired by Charlie Zhang.
- Friday morning: Common session on Agenda item 6.2.4 (PUCCH).
- Friday afternoon: Revisions

The list of action points that required RAN1 close follow-up is listed in Annex F (end of document).

The number of contribution documents for this meeting was 811.

Agenda Item	Input Document	Discussed Document
From AI 4 to AI 6.9.2	809	328

Note: The amount of documents includes those discussed during the email discussion session post meeting.

The following documents are missing. The corresponding contributions have not been handed over by companies.

1. Opening of the meeting

Mr. Matthew Baker (RAN1 Chairman) welcomed the participants to the 61st RAN WG1 meeting and opened the meeting at 09:08.
Mr Hua Xu from RIM welcomed the delegates and detailed the domestic arrangements (coffee breaks, restaurants) for the week. A powerpoint was briefly shown and highlighted some aspects of Montreal's area and surroundings to the benefit of delegates.

1.1 Call for IPR

The Chairman drew attention to Members' obligations under the 3GPP Partner Organizations' IPR policies. Every Individual Member organization is obliged to declare to the Partner Organization or Organizations of which it is a member any IPR owned by the Individual Member or any other organization which is or is likely to become essential to the work of 3GPP.

The attention of the members of this Technical Specification Group is drawn to the fact **that 3GPP Individual Members have the obligation** under the IPR Policies of their respective Organizational Partners to **inform their respective** Organizational Partners **of Essential IPRs they become aware of**.
The members take note that they are hereby invited:
- to investigate in their company whether their company does own IPRs which are, or are likely to become Essential in respect of the work of the Technical Specification Group.
- to notify the Director-General, or the Chairman of their **respective** Organizational Partners, of all potential IPRs that their company may own, by means of the IPR Statement and the Licensing declaration forms (e.g. see the ETSI IPR forms http://webapp.etsi.org/Ipr/).

2 Approval of Agenda

R1-103295	Draft Agenda for RAN1#61 meeting	RAN1 Chairman	(R1-102600)

Matthew Baker (Chairman) proposed the agenda for the meeting and the plan (tentative schedule) of the week.
Decision: The agenda is approved.

3 Approval of Minutes from previous meeting

R1-102601	Final report of RAN1#60bis meeting	MCC Support	

The document was presented by Patrick Mérias (ETSI Mobile Competence Center) and provides the outcomes of last meeting. It was brought to the attention of the group that non 3GPP members were attending RAN1#60bis. Only guests (officially invited by 3GPP members) are allowed.
Decision: The document is approved.

4 Incoming Liaison Statements

R1-102602	LS on Primary Component Carrier and Semi Persistent Scheduling	RAN2, Samsung	= R2-102654

The document was presented by Aris Papasakellariou from Samsung and asks RAN1 to take into account RAN2 decision that SPS is configured only in PCC. It is also requested to answer if it is a valid assumption that UE needs to monitor SPS C-RNTI only in the PCC.
Decision: The document is noted.

R1-103081	LS reply on Primary Component Carrier and Semi Persistent Scheduling	Huawei, CMCC	

The document was presented by Ms Elean Fan from Huawei and states that RAN2 assumption is valid.

Discussion (Question / Comment): .
Decision: The document is noted. The final reply shall be reviewed on Friday.

R1-103290	On LS for the CIF application cases in SPS scheduling	ZTE	(R1-102893)

The document was presented by Zhisong Zuo from ZTE and suggests the following reply:

- For the case that PDCCH of PCC may suffer strong interference, the systems need not to prohibit the cross-carrier scheduling for SPS. For the case that PCC is always in CC with low interference, cross-carrier scheduled SPS may not needed,
- The CIF field should be always enabled in UE specific way, whether the eNodeB schedule the SPS in PCC or not.

Discussion (Question / Comment): Alacatel-Lucent, Ericsson, Nokia and Panasonic believe that Huawei's response is sufficient. Mr Chairman asked whether companies request more time to further check the details.
Decision: The document is noted.
Friday 14th

R1-103418	LS reply on Primary Component Carrier and Semi Persistent Scheduling	Huawei, CMCC, ZTE	(R1-103081)

Decision: The document is noted and final LS is agreed in R1-103421.

R1-102603	LS on pathloss measurements in CA scenarios	RAN2, Nokia	= R2-102662

The document was presented by Asbjorn Grovlen from Nokia and shows the agreements w.r.t the linking of DL and UL CC made by RAN2. RAN2 has also discussed pathloss measurement and understands that pathloss measurement are used for PRACH power control, PUSCH and PUCCH transmission. A few questions on the pathloss measurements were raised to RAN4.
Discussion (Question / Comment): No action required from RAN1.
Decision: The document is noted.

R1-102604	LS on Radio Link monitoring for Carrier Aggregation	RAN2, Ericsson	= R2-102663

The document was presented by Daniel Larsson from Ericsson and shows the agreements w.r.t the radio link monitoring and failure handling for Carrier Aggregation made by RAN2.
Discussion (Question / Comment): No action required from RAN1.
Decision: The document is noted.

R1-102681	UE RF model and capability	RAN2, Qualcomm	= R2-102664

The document was presented by Peter Gaal from Qualcomm and asks a number of issues to RAN4 w.r.t the need of understanding UE RF model and capability. It is related to the need of "interruption" in ongoing communication when certain actions are taken in RRC connected mode.
Discussion (Question / Comment): No action required from RAN1.
Decision: The document is noted.

R1-103051	Reply LS on synchronization requirements between eNB and relay	RAN4, Ericsson	= R4-101490

The document was presented by Christian Hoymann from Ericsson and is a reply LS to R1-100832. The Tx/Rx and Rx/Tx switching times will be less than 17us, which is the RAN4 requirement for an eNB switch time in Rel 8/9. The maximum limit on switch times will be determined by RAN4.
Discussion (Question / Comment): This shall be taken into account under AI 6.6.
Decision: The document is noted.

R1-102688	Suggestion for the response to the RAN4 LS on the UL transmission	LG Electronics	

The document was presented by Joon Kui Ahn from LGE and is a proposal for a reply to R1-101720. The reply informs on RAN1 current agreements as follows:

- Both simultaneous PUSCH/PUCCH transmission and UCI piggybacking to PUSCH as in Rel-8/9 shall be supported. Exact switching mechanism between the simultaneous transmission and Rel-8/9 signaling is FFS.
- Clustered DFT-S-OFDM transmission should be supported. Dynamic switching between clustered DFT-S-OFDM transmission and contiguous RB transmission will be specified. The maximum number of supportable clusters is under discussion.
- Current RAN1 agreement is not supporting multiple simultaneous PUCCH transmission for A/N in multiple non-adjacent PRBs. It is still FFS how to handle, for example, simultaneous A/N, CQI and SR in Rel-10.

Discussion (Question / Comment): .
Decision: The document is noted.

R1-102777	Draft response to LS from RAN4 on simultaneous PUSCH and PUCCH and clustered SC-FDMA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Fang-Chen Cheng from Alcatel-Lucent and states that there is no consensus in RAN1 to change either the CA WID or the agreements from RAN1#55bis to support clustered DFT-S-OFDM UL transmission and control-data decoupling (simultaneous PUCCH and PUSCH transmission).
Discussion (Question / Comment): Motorola raised that new results have been obtained. Mr Chairman suggested to look at the new contributions under AI 6.2.6.
Ericsson pointed out that source of the LS should be company's name and not RAN1. Contact information is also useful to figure out who is behind the LS.
Decision: The document is noted. Reply LS shall be discussed under AI 6.2.6.

R1-103080	LS reply on configurable transmission modes for Category 1 UE	Huawei	

The document was presented by Zhenfei Tang from Huawei and states that there is no restriction on the reported RI for the Category 1 UE. A Category 1 UE can always set RI = 1 in the transmission mode 3/4. RAN1 confirms that all release 8 UE categories should support transmission modes 1-7.
Discussion (Question / Comment): RAN1 agrees that the UE capability relates to the whole transmission mode 7, not just antenna port 5.
Decision: The document is noted. LS reply shall be updated in R1-103349 to reflect the agreement and drat CR (Rel-8) to 36.306 shall be prepared in R1-103350 (Zhenfei Tang – Huawei).
Friday 14th : Final LS is agreed in R1-103413, including the following CR for approval by RAN2.

R1-103350	36.306 CR (Rel-8, F) Correction on the definition of ue-SpecificRefSigsSupported	Huawei, Panasonic, Ericsson, ST-Ericsson, NTT DOCOMO, CATT, CATR, Qualcomm Incorporated, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CMCC, Motorola, NEC, Nokia, Nokia Siemens Networks, New Postcom, Potevio	

Decision: The document is endorsed by RAN1 together with shadowed CR for Rel-9 in R1-103362.

R1-103296	Reply LS on multiple timing advance for inter-band CA	RAN4, NTT DoCoMo	= R4-101477

The document was presented by Sadayuki Abeta from NTT DoCoMo and provides the conclusion of the necessities of supporting multiple timing advances for Scenario #2 and #3 as follows: the timing difference for the strongest paths is less than 0.52 us (one timing advance step) for 97-98% of the cases and always less than 2.5 us. RAN4 is currently investigating the performance and complexity impact of timing misalignment on link performance.
Discussion (Question / Comment): No action required from RAN1.
Decision: The document is noted.

R1-103298	Further clarification on downlink positioning reference signal EPRE	RAN4, Ericsson	= R4-101547

The document was presented by … from Ericsson and informs of the agreed way forward in [R4-101503] in order to complete the RSTD requirements including those related to muting. As a consequence of this agreement and the RAN2/3 action to provide signaling support for muting, RAN4 requests RAN1 to specify that the UE can assume that each individual cell's PRS EPRE is constant over all subframes within a PRS positioning occasion of that cell.
Decision: The document is noted. Relevant CR is for discussion under AI 6.1.

R1-103297	Signaling support for positioning reference signal muting	RAN4, Ericsson	= R4-101540

The document was presented by Daniel Larsson from Ericsson and requests RAN2 and RAN3 to provide signaling support for cell-specific PRS muting configuration in the OTDOA assistance data for Rel. 9.
Discussion (Question / Comment): No action required from RAN1.
Decision: The document is noted.

LS received during the course of the week.

R1-103331	Reply LS on CSI RS boosting impact on BS transmission distortion	RAN4, Nokia Siemens Networks, Huawei	= R4-102236

The document was presented by Timo Lunttila from NSN and raises the following two questions:

- Q1: For a BS transmitting at an antenna with maximum power when all the REs have the same EPRE and using a PA corresponding to practical implementations, how is the noise level per RE due to non-ideal PA behavior on

PDSCH REs, CSI RS REs and silent REs affected when the CSI RS is boosted in the above mentioned manner or conceivable manners using boosting values as implied by N equal to 2, 4, or 8? The power boosted REs can occur at one or two OFDM symbols in as often as every 5 ms.

- Q2: Are there any other foreseen impacts on other RF performance parameters, e.g. emissions, in relation to the CSI RS design problem that RAN1 should be aware of?

Decision: The document is noted. Relevant for future work on CSI RS.

5 UTRA

R1-103308	Minutes from RAN1#61 HSPA sessions	Ad Hoc chairman (Ericsson)	

The document was presented by Johan Bergman from Ericsson.
Decision: The document is endorsed and reported as follows in sections 5.1, 5.3, 5.4, 5.5 and 5.6.

5.1 Maintenance of UTRA Release 99 – Release 9

5.1.1 FDD

R1-102919	25.214 CR0602 (Rel-7, F) Clarification of the transmit power of S-CPICH for CQI reporting when the UE is configured in MIMO mode	Huawei	

Decision: The document is noted.

R1-102920	25.214 CR0603 (Rel-8, A) Clarification of the transmit power of S-CPICH for CQI reporting when the UE is configured in MIMO mode	Huawei	

Decision: The document is noted.

R1-102921	25.214 CR0604 (Rel-9, A) Clarification of the transmit power of S-CPICH for CQI reporting when the UE is configured in MIMO mode	Huawei	

Decision: The document is noted. Offline discussion till Friday.
Friday 14th : CRs have been respectively revised in R1-103407 (Rel-7), R1-103408 (Rel-8) and R1-103409 (Rel-9). Huawei suggested to leave them for email approval until 21th May.

R1-103312	25.214 CR0605R1 (Rel-7, F) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA PCH states	Infineon Technologies	(R1-103073)

Decision: The document is noted. Provide revisions of R1-103312/3074/3075 in R1-103314/3315/3316 (Infineon).

R1-103074	25.214 CR0606 (Rel-8, A) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA PCH states	Infineon Technologies	
R1-103075	25.214 CR0607 (Rel-9, A) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA PCH states	Infineon Technologies	

Friday 14th : CRs in R1-103314/3315/3316 are now co-sourced by Qualcomm. As there are still many comments received offline, CRs are for email approval until 21th May.

R1-103284	Efficient secondary carrier activation for DB DC-HSDPA	Huawei	

Decision: The document is noted.

5.1.2 TDD

R1-103146	25 221 CR0207 (Rel-8, F) Clarification for support of an E-HICH pair for 1.28Mcps TDD	TD Tech	

Decision: The document is noted.

R1-103147	25 221 CR0208 (Rel-9,A) Clarification for support of an E-HICH pair for 1.28Mcps TDD	TD Tech	

Decision: The document is noted. Both are agreed in principle. Provide revisions (R1) in R1-103310/3311 (TD Tech) with improved wording and removed tracking on cover sheet.
Friday 14th : CRs in R1-103310/3311 are agreed.

5.2 4-carriers HSDPA

WID in RP-091438

5.2.1 HS-DPCCH design

Channelisation codes, Mapping and coding

R1-102887	Some Aspects of HS-DPCCH Design for 4C-HSDPA with MIMO Configuration	ZTE	

The document was presented by Jun Qiang from ZTE and proposes that:

- Alternative 3 is taken as the HS-DPCCH design.
- SF256 HS-DPCCH for the cases that 3C or 4C are activated without MIMO configured in any activated carrier.
- Adopt the HARQ codebook schemes in Table 2 as the HARQ codebook when different carriers are activated.
- Adopt the coding schemes in Table 4 as the CQI/PCI coding when different carriers are activated.
- Flexible mapping of DL carrier feedback information onto the HS-DPCCH channels is supported.
- For the flexible mapping of DL carrier feedback information onto the HS-DPCCH channels, the primary carrier (C1) and the activated secondary carrier #1 (C2, if any) are grouped together as Group 1, the other activated secondary carriers (C3 and C4, if any) as Group 2.

Discussion (Question / Comment): Motorola asked clarifying whether DTX in table 1 was refering to DTX codeword? Yes.
Decision: The document is noted.

R1-102922	Considerations on HS-DPCCH design for 4C-HSDPA	Huawei	

The document was presented by Bo Yang from Huawei and provides general overviews of HS-DPCCH schemes for various possible scenarios.

- For scenario 1 (3/4C activated with MIMO configured on 1 or more activated carriers),
  - Apply flexible grouping of DL carriers according to activation/deactivation and MIMO configuration of DL carriers.
  - A DTX codeword is used to avoid half-slot DTX of HARQ-ACK slot.
- HS-DPCCH designs for scenario 2 (4C activated without MIMO configured) are discussed in detail in companion paper [R1-102924].
  - A trade-off shall be made to decide the design option of 1xSF1256 (or 1xSF128 with repetition) and 1xSF128 (general design) for 4-carrier without MIMO.
- HS-DPCCH designs for scenario 3 (3C activated without MIMO configured) are discussed in detail in companion paper [R1-102923].
  - Joint coding of HARQ-ACK messages of 3 carriers for the case of 3-carrier without MIMO.
  - Adopt cross-combined CQI feedback scheme for the case of 3-carrier without MIMO.
  - Apply 1xSF256 HS-DPCCH scheme for the case of 3-carrier without MIMO.
- For scenario 4 (less than 3 carriers activated),
  - The HS-DPCCH should fall back to legacy 1xSF256 formats when less than 3 carriers are activated. Otherwise, at least, the chip output of HS-DPCCH should be the same as 1xSF256 HS-DPCCH.

Decision: The document is noted.

R1-102925	Discussion on grouping of DL carriers for 4C-HSDPA	Huawei	

The document was presented by Bo Yang from Huawei and proposes that:

- Identical HS-DPCCH format shall be used for the same scenarios of activated carriers.
- Use flexible arranging and grouping of feedback information of DL carriers onto HS-DPCCH channels when the status of secondary carriers is changed by activation/deactivation.
- Fallback to legacy SF256 HS-DPCCH format or to use flexible grouped repetition and bit interleaving scheme with 1xSF128, when less than 3 carriers are activated.

Discussion (Question / Comment): Ericsson asked whether the flexible mapping scheme applies to primary carrier? Yes.
Decision: The document is noted.

R1-103129	HS-DPCCH format change due to activation and de-activation of secondary carriers	Qualcomm Incorporated	

The document was presented by Sharad Sambhwani from Qualcomm and draws the following conclusions:

- A Rel-10 3C/4C-HSDPA UE, when configured with single or dual cells with or without MIMO should use the legacy HS-DPCCH physical layer design (channel coding, spreading factor, modulation, CQI reporting).

- If upon receiving an HS-SCCH order from a NodeB corresponding to activation/de-activation of secondary HS-DSCH serving cells and secondary uplink frequency, if there are one or two active HS-DSCH serving cells remaining, a Rel-10 3C/4C-HSDPA UE, should use the legacy HS-DPCCH physical layer design (channel coding, spreading factor, modulation, CQI reporting) as specified in previous releases (Rel-5 through Rel-9).
- A Rel-10 3C/4C-HSDPA UE, uses a symbol interleaver for HS-DPCCH ACK/NACK and a separate symbol interleaver for CQI as described in Section 6 prior to spreading by Cch128,16 (Nmax_dpdch = 0) or by Cch128,32 (Nmax_dpdch = 1) , when 3 or 4 carriers are activated with MIMO configured on 1 or more activated carriers.
- The HS-DPCCH power offset (ΔACK) is boosted by an additional amount (FFS) when an acknowledgement is sent in response to a carrier (de)activation HS-SCCH order.
- Upon (de)activation of carriers, the UE applies a boost to the HS-DPCCH power offsets (ΔACK, ΔNACK, ΔCQI) for a small period of time (FFS).
- Upon de(activation) of carriers to 1 or 2 active carriers, the HS-DPCCH power offsets (ΔACK, ΔNACK, ΔCQI) are set to different power settings relative to before the HS-SCCH order.

Decision: The document is noted.

Although more details can be found in companies's contributions, Mr Chairman decided to go through R1-103293.

R1-103293	Way forward for HS-DPCCH for 4C-HSDPA	Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Nokia, Nokia Siemens Networks, ST-Ericsson, Samsung	(R1-103287)

The document was presented by Johan Bergman from Ericsson and draws the following proposal as basis for further design:

- Proposal 1: Adopt SF128 for HS-DPCCH for all cases when 3 or 4 carriers are configured.
- Proposal 2: A DTX codeword is included in the ACK/NACK codebook.
- Proposal 3: Changing transmission power in the middle of an uplink slot due to half slot ACK/NACK transmission should be avoided.
- Proposal 4: The ACK/NACK and CQI/PCI information for the 1st and 2nd carriers is repeated when the 3rd and 4th carriers are deactivated.
- Proposal 5: The minimum CQI feedback cycle is 4 ms for all cases when 3 or 4 carriers are configured.

Discussion (Question / Comment): Motorola asked: should the wording of proposal 3 be "should be avoided" or "shouldn't be allowed"? Not allowed is the correct meaning.
Ericsson confirmed that they will go with alternative 1 as reply to Mr Chairman's question.
Motorola commented that for the sake of limiting the complexity at the UE, they will support the proposed way forward in R1-103293.

Decision: The document is noted and the following is agreed:

~~Proposal:~~

- Adopt SF128 for HS-DPCCH for all cases when 3 or 4 carriers are configured
  - Channelisation code is $C_{ch128,16}$ if Nmax_dpdch = 0 and $C_{ch128,32}$ if Nmax_dpdch = 1
- A DTX codeword is included in the ACK/NACK codebook.
  - The DTX codeword is the POST codeword
- Changing transmission power in the middle of an uplink slot due to half slot ACK/NACK transmission shall be avoided
- The ACK/NACK and CQI/PCI information is remapped and repeated when only 1 or 2 carriers remain activated.
  - Upon (de)activation of carriers to/from 1 or 2 active carriers, the HS-DPCCH power offsets are set to different power settings relative to before the HS-SCCH order.
  - Information corresponding to primary carrier is never remapped
- Timing of HS-DPCCH changes corresponding to (de)activation relative to HS-SCCH order follows same timing rules as in Rel-8/9
- Consider measures for ensuring reliability:
  - The HS-DPCCH power offset (ΔACK) is boosted by an additional amount (FFS) when an acknowledgement is sent in response to a carrier (de)activation HS-SCCH order.
  - Upon (de)activation of carriers, the UE applies a boost to the HS-DPCCH power offsets (ΔACK, ΔNACK, ΔCQI) for a small period of time of the order of subframes (FFS).
- A Rel-10 3C/4C-HSDPA UE, when configured with single or dual cells with or without MIMO should use the legacy HS-DPCCH physical layer design (channel coding, spreading factor, modulation, CQI reporting) as specified in previous releases (Rel-5 through Rel-9).

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Consider 3 carriers w/o MIMO shortly…

The minimum CQI feedback cycle is 4 ms for all cases when 3 or 4 carriers are configured.

R1-102620	HS-DPCCH design for 4C-HSDPA	Ericsson, ST-Ericsson	

The document was presented by Johan Bergman from Ericsson and provides further highlights on the flexible remapping of carriers
Decision: The document is noted.

R1-103294	HS-DPCCH design for 3-carrier without MIMO	Huawei	(R1-102923)

The document was presented by Yang Bo from Huawei and proposes:
- Joint coding of HARQ-ACK messages of 3 carriers for the case of 3-carrier without MIMO.
- Adopt cross-combined CQI feedback scheme for the case of 3-carrier without MIMO.
- Apply 1xSF256 HS-DPCCH scheme for the case of 3-carrier without MIMO.

Decision: The document is noted.

R1-103130	HS-DPCCH design for 3C without MIMO	Qualcomm Incorporated	

The document was presented by Arjun Bharadwaj from Qualcomm and draws the following proposals:
- Adopt a single code book Rel-10 TC-HSDPA solution for the case when the UE is configured with 3 carriers without MIMO.
- The code words that are members of the codebook Rel-10 TC-HSDPA are FFS.
- A single Δ_{CQI} value is set for all carriers in a particular configuration, but could be different for different configurations.
- The HS-DPCCH ACK/NACK and CQI information is transmitted using a 1xSF256 code when the UE is configured with 3 carriers without MIMO.

Decision: The document is noted.

R1-103309	Additional considerations on HS-DPCCH optimizations for 3C-HSDPA	Ericsson, ST-Ericsson	

The document was presented by Johan Hultell from Ericsson and focuses on simulation results using, in particular codebooks as proposed by Huawei in R1-102923. It is proposed to:
- Adopt a 1xSF128 HS-DPCCH solution also for the case of 3C-HSDPA and where none of the carriers are configured with MIMO.
- Reuse the Rel-9 HARQ-ACK codebook also for the case of 3C-HSDPA and where none of the carriers are configured with MIMO.

Decision: The document is noted.

<u>Case of 3C configured w/o MIMO is FFS until RAN1#61bis:</u>
- Alt 1: SF128
  - Alt 1a: Re-use Rel-9 codebook
  - Alt 1b: New codebook
- Alt 2: SF256
- Alt 3: SF128 except for UEs of a category limited to 3C w/o MIMO
- Choice of codebook FFS

Not treated.

R1-102778	HS-DPCCH channelisation codes and information mapping	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-102924	HS-DPCCH design for 4-carrier without MIMO	Huawei	
R1-103076	Further considerations on HS-DPCCH frame structure design for 4C-HSDPA	InterDigital Communications, LLC	
R1-103274	HS-DPCCH solution for 4-carrier HSDPA	Nokia, Nokia Siemens Networks	

5.2.2 Other details

CQI configuration

R1-102621	CQI feedback cycle for 4C-HSDPA	Ericsson, ST-Ericsson	

The document was presented by Johan Hultell from Ericsson and concludes as follows:

- Adopt 4ms as the minimum CQI feedback cycle for the case 3C w/o MIMO.
- The CQI feedback cycle is configurable per carrier.
- The CQI repetition factor 'N_cqi_transmit' is common for all downlink carriers.
- The CQI information associated with carrier k is transmitted in consecutive manner if CQI repetition is employed.
- For the CQI reporting reduction mechanism, there is a single state machine (CQI_DTX_Priority) and a single threshold parameter (CQI_DTX_TIMER)

Decision: The document is noted.

R1-102926	CQI configuration for 4C-HSDPA	Huawei	

The document was presented by Yang Bo from Huawei and proposes:

- Common CQI feedback cycle and CQI repetition factor are configured for the 3/4C-HSDPA capable UE.
- A practical CQI feedback cycle is set for each scenario and could be derived from the common configured CQI feedback cycle and a scenario specific CQI feedback factor f_i

Discussion (Question / Comment): NSN asked what the criteria for defining specific CQI feedback factor f_i are?
Decision: The document is noted.

R1-103079	Consideration of CQI Feedback Design for 4-carrier HSDPA	InterDigital Communications, LLC	

The document was presented by Joseph Levy from InterDigital and proposes to allow non-common CQI feedback parameter configuration for 4C-HSDPA.
Discussion (Question / Comment): Ericsson commented that non-common CQI feedback could be done per carrier and leave to higher layers configuration issues.
Decision: The document is noted.

R1-103131	CQI Configuration in 4C-HSDPA	Qualcomm Incorporated	

The document was presented by Arjun Bharadwaj from Qualcomm and draws the following proposals:

- A single Δ_{CQI} value is set for all carriers in a particular configuration but could be different for different configurations.
- A simple CQI mapping is adopted when the UE has 3/4 active carriers with MIMO on at least one of the active carriers, where the CQI information for each carrier is transmitted in the corresponding slot while maintaining the logical mapping that was originally signalled.
- The CQI feedback cycle is configured on a per carrier basis for both Rel-9 DB-DC-HSDPA and Rel-10 4C-HSDPA.
- The CQI nominal reporting timer, CQI DTX priority and the CQI transmission pattern for 4C-HSDPA is defined in the same way as in the case of Rel-9 DC-MIMO.

Decision: The document is noted.

Proposal for min CQI reporting period

- 4ms: Nokia, NSN, Ericsson, ST-Ericsson, ALU, ALU SB, Qualcomm, Motorola, Samsung
- Cross-combined (3ms): Huawei

Huawei kindly agreed to go with 4ms, therefore 4ms is the period also for 3C without MIMO (same as 3C with MIMO and all cases of 4C)

Agreements

- Min CQI reporting period:
  - 4ms also for 3C w/o MIMO
- CQI feedback cycle
  - Common
- N_cqi_transmit
  - Common
- CQI_DTX_Priority

  - Common
- CQI_DTX_Timer
  - Common
- Delta_CQI (RRC parameter)
  - Common
- CQI power offset depends on activation/deactivation status

Send LS to RAN2 to inform about the agreements in R1-103321.

Friday 14th

R1-103321	[DRAFT] LS on agreements on HS-DPCCH design for 4C-HSDPA	Qualcomm Incorporated	

The document was presented by Arjun Bharadwaj from Qualcomm.
Decision: The document is noted and final LS agreed as R1-103423.

DRX cycle

R1-103370	Considerations for 4-carrier HSDPA DRX Design	InterDigital Communications, LLC	(R1-103077)

The document was presented by Joseph Levy from InterDigital and proposes the following:
- HS-SCCH monitoring is performed per-band.
- DRX parameters are common to all carriers.
- DRX activation status is common to all carriers and is controlled via HS-SCCH orders.

Decision: The document is noted.

R1-102622	UE DRX for 4C-HSDPA	Ericsson, ST-Ericsson	

The document was presented by Johan Hultell from Ericsson and deals with UE DRX state machine design for 4C-HSDPA:
- Await feedback on the LS to RAN4 before deciding on whether the UE DRX state machine should be common or carrier-specific.
- Agree on carrier specific UE DRX state machines in Rel-10 if HS-SCCH ordered activation (deactivation) of secondary carriers in a secondary band affects transmission and reception of the carriers in the primary band.

In addition, the paper concludes that there are no strong reasons for a UE to autonomously deactivate secondary carriers since HS-SCCH orders already exists and would have to be used for Rel-9 DB-HSDPA UEs anyway.
Decision: The document is noted.

R1-102927	Timer based implicit deactivation for Dual Band 4C-HSDPA	Huawei	

The document was presented by Yang Bo from Huawei and deals with the implicit carrier deactivation with following proposals:
- The carriers on the band not including primary carrier can be implicitly deactivated simultaneously when the UE enters DRX cycle.
- Implicit deactivation is based on expiry of a common deactivation timer initiated after the UE enters DRX cycle.
- The activation of implicitly deactivated carriers is performed explicitly via the legacy HS-SCCH order.
- The implicit deactivation shall be allowed to be switched on or off through RRC signaling.

Decision: The document is noted.

R1-103078	Timer based secondary serving HS-DSCH cell deactivation	InterDigital Communications, LLC	

The document was presented by … from InterDigital and proposes the following:
- Agree on timer based autonomous carrier deactivation.
- The UE deactivates the secondary carriers upon the expiry of an inactivity period after the UE has entered DRX mode.
- The deactivation timer is configured on a per carrier basis.
- Carrier reactivation should be based on HS-SCCH orders.
- Secondary DL carriers associated with an activated secondary uplink carrier may not be deactivated by autonomous timer based deactivation.

Decision: The document is noted.

R1-103273	Power saving solutions for 4C-HSDPA	Nokia, Nokia Siemens Networks, Qualcomm	

The document was presented by … from Nokia and proposes the following:

- Legacy DRX operation with common parameters defined for DC/DB-HSDPA is also applied for 4C-HSDPA.
- HS-SCCH orders can be used to activate and deactivate carriers regardless of possible usage of new network-controlled automatic carrier deactivation scheme.
- Introduce new network-controlled automatic secondary carrier deactivation when the primary carrier enters the DRX cycle.
- Each secondary carrier has an independent deactivation timer set by the network
- Discuss whether the deactivated secondary carrier(s) is/are activated automatically by data scheduled over the primary carrier or by an explicit HS-SCCH order

Decision: The document is noted.

W.r.t DRX cycle, await feedback from RAN4.

Continue discussion at RAN1#61bis on timer-based autonomous carrier deactivation techniques.

5.2.3 Draft CRs

R1-103132	25.211 CR Introduction of 4C-HSDPA	Qualcomm Incorporated	
R1-103133	25.212 CR Introduction of 4C-HSDPA	Qualcomm Incorporated	
R1-103134	25.213 CR Introduction of 4C-HSDPA	Qualcomm Incorporated	
R1-103135	25.214 CR Introduction of 4C-HSDPA	Qualcomm Incorporated	
R1-103136	25.215 CR Introduction of 4C-HSDPA	Qualcomm Incorporated	

5.3 LCR TDD MC-HSUPA

WID in RP-090990

R1-103148	Email Discussion Summary for LCR TDD MC-HSUPA	TD Tech	

The document was presented by Fan Chen from TD Tech.
Decision: The document is noted.

Agreements:

- UE combine all SS signal on each E-AGCH/E-HICH in the same TTI into one UL time advance vale.
- If HS-DSCH without DPCH is supported in MC-HUSPA, UE check the CRC of all HS-SCCH/E-AGCH/HS-PDSCH for in sync, out-of sync detection
- The desired E-PUCH received power (PRXdes_base) for E-PUCH Open loop power control should be configured per carrier.
- The baseline configuration is to have E-AGCH and its corresponding E-PUCH on the same carrier.
    - If it decided to not support a dynamic E-AGCH/E-PUCH carrier relationship then the E-AGCH type of each carrier in MC-HSUPA shall be decided by the configured feature(s) on this carrier, i.e. if any feature configured on this carrier shall use E-AGCH type 2 then E-AGCH type 2 shall be used for this carrier, otherwise E-AGCH type 1 shall be used for this carrier.
    - If it decided to support a dynamic E-AGCH/E-PUCH carrier relationship then E-AGCH type 2 shall be used.
- The maximum allowed UL TX Power in MC-HSUPA should be configured per UE. All carriers use the same value.

Open issues:

- Whether it should be possible to have E-AGCH and its corresponding E-PUCH on different carriers, and whether the relationship in that case should be semi-static (RNC configured) or dynamic (with a carrier indicator field in E-AGCH).
- Should the UPH be estimated by the UE and reported for one of the carriers only or for each one of the carriers?
    - At least in the open loop power control case, Node B should be able to estimate UPH of other carriers from this value.

- One company has indicated that they see a need to report UPH per carrier in the closed loop power control case.
- Any performance concerns with reporting a single UPH should be raised until the next meeting. Any performance loss should be viewed in relation to the UPH overhead.

- SI structure on E-RUCCH or E-RUCCH structure
- SI structure on E-PUCH
- The reporting of UPH
- SI reporting on E-RUCCH: Which carrier is selected to send the SI?
- MC-HSUPA Control channel DRX should be maintained per carrier or per UE.

R1-102683	Discussion on DPCH and non-scheduled E-PUCH in LCR TDD MC-HSUPA	CATT	

Decision: The document is noted.

Agreements:
- In MC-HSUPA, DPCH can be configured on zero or one carriers.
- In MC-HSUPA, non-scheduled E-PUCH transmission cannot be configured.

R1-102684	Consideration on E-AGCH type in MC-HSUPA for LCR TDD	CATT	

Decision: The document is noted.

R1-103139	Discussion on E-AGCH of 1.28M TDD MC-HSUPA	ZTE	

Decision: The document is noted.

R1-102685	Discussion on UPH for 1.28Mcps TDD MC-HSUPA	CATT	

Decision: The document is noted.

R1-103140	Discussion on UPH of 1.28M TDD MC-HSUPA	ZTE	

Decision: The document is noted.

R1-103152	UPH reporting of MC-HSUPA UE for LCR TDD	TD Tech	

Decision: The document is noted.

R1-103138	Discussion on SNPL for 1.28M TDD MC-HSUPA	ZTE	

Decision: The document is noted.

R1-103352	E-RUCCH of MC-HSUPA UE for LCR TDD	TD Tech	(R1-103151)

Decision: The document is noted.

A way forward regarding the E-RUCCH format can be provided in R1-103313 (TD Tech).

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R1-103313	Way forward on MC-HSUPA E-RUCCH for LCR TDD	TD Tech, ZTE, CATT, New Postcom, Ericsson	

The document was presented by Fan Chen from TD Tech.
Decision: The document is noted and the WF is agreed.

R1-103141	Discussion on control channel DRX of 1.28M TDD MC-HSUPA	ZTE	

Decision: The document is noted.

R1-103149	Discussion on DRX procedures for MC-HUSPA	TD Tech	

Decision: The document is noted.
Companies are encouraged to evaluate the potential battery savings from the different proposals till the next meeting.

R1-103150	Discussion on synchronisation procedures for MC-HUSPA	TD Tech	

Decision: The document is noted.

Agreements:

- When DPCH is configured in MC-HSUPA, the Sync procedure is the same as for single carrier Dedicated channel synchronisation, i.e. the UE should measure the burst reception quality and the CRC of DPCH for DL Sync detection.
- When DPCH is not configured in MC-HSUPA, the Sync procedure is the same as for single carrier Shared channel synchronisation, UE should measure the CRC of all HS-SCCH, E-AGCH and HS-DSCH for Sync detection.
    - It is FFS whether E-HICH should also be used for Sync detection.

5.4 MU-MIMO for LCR TDD

WID in RP-100347

R1-102842	Analysis on the basic issues of MU-MIMO for LCR TDD	New Postcom	

The document is withdrawn.

R1-102686	Consideration on special default midamble allocation scheme in MU-MIMO for LCR TDD	CATT, ZTE	

Decision: The document is noted.

R1-103154	Discussion on standalone midamble channel assisted MU-MIMO for 1.28Mcps TDD	TD Tech	

Decision: The document is noted.

Agreements:

- The special default midamble allocation scheme shall be introduced in CELL_DCH and CELL_FACH state to allow up to 4 different UEs use the same channelization codes and different midamble shifts for both HS-DSCH and E-DCH.
- Only one capability shall be reported to NW by UE using L3 signaling and it is independent of SU-MIMO capability. NW shall indicate whether the special default midamble allocation scheme is configured.
- The special default midamble allocation scheme can be configured together with SPS or SU-MIMO for one UE, but the special default midamble allocation scheme can not be used with SPS scheme or SU-MIMO scheme in one TTI for one UE.
- E-HICH signature sequence allocation mechanism shall be optimized to allow the signature sequences for the UEs sharing the same channelization codes to be mapped on the same E-HICH.
- The inter-cell interference caused by Special default midamble allocation scheme can be considered.
- The periodic standalone midamble shall be introduced as an optional configuration.
- The special default midamble allocation scheme will be extended to 4 patterns to support 4-user MU-MIMO.
- In MU-MIMO, the mapping from logical resource tag ID to physical allocation resource tag ID remains unchanged.

R1-102687	Discussion on optimization of E-HICH signature sequence allocation mechanism in MU-MIMO	CATT	

Decision: The document is noted.

R1-103351	Discussion on logical resource tag ID allocation scheme for MU-MIMO of 1.28Mcps TDD	ZTE	(R1-103137)

Decision: The document is noted.

R1-103153	Signature sequence allocation in MU MIMO for LCR TDD	TD Tech	

Decision: The document is noted.
Companies are encouraged to evaluate the proposed signature sequence allocation schemes until the next meeting.

5.5 SI on Energy Saving for UMTS

SID RP-091439

R1-103353	On aspects of Text proposals to TR 25.927	Vodafone	

Decision: The document is noted.

R1-103275	Discussion on energy saving proposals	Nokia Siemens Networks, Nokia	

Decision: The document is noted.

R1-102624	On non-backwards compatible solutions for NodeB energy saving	Ericsson, ST-Ericsson	

Decision: The document is noted.

R1-102623	Improved Iub/Iur support for NodeB energy saving	Ericsson, ST-Ericsson	

Decision: The document is noted.

R1-102779	Text Proposal to TR25.927 on NodeB DTX	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

Decision: The document is noted.

R1-102929	Further discussion on gradually cell switch off&on method	Huawei	

Decision: The document is noted.

R1-103356	TP to TR25.927: Dynamic switch on/off secondary antenna in MIMO system	ZTE, China Unicom	(R1-102888)

Decision: The document is noted.

R1-102930	TP to TR 25.927 "Solutions for energy saving within UTRA Node B"	Huawei	

Decision: The document is noted.

R1-103276	TP on Cell DTX	Nokia Siemens Networks, Nokia	

Decision: The document is noted.

Provide draft TPs for the following concepts:

- Dormant mode (R1-103317, Huawei+Ericsson)
  - Power ramping
  - Secondary carrier deactivation
- Secondary antenna deactivation (R1-103318, ZTE+Ericsson)
- Power control of common channels (R1-103319, ZTE+NSN)
  - UE-assisted power control
- Cell DTX (R1-103320, ALU+NSN)

The above set of TPs are for email approval until 21st May. The final compiled TR shall be prepared in R1-103424 and for email approval until 25th May.

5.6 SI on Improvements for Distributed Antennas for LCR TDD

SID RP-100178

R1-103142	Discussion on improvements of distributed antenna for 1.28Mcps TDD	ZTE	

Decision: The document is noted.

Focus scenarios:

- In-door coverage
- High-speed coverage
- Blind spot coverage

Companies are encouraged to investigate whether other scenarios should also be considered.
Initiate an email discussion (ZTE) till the next meeting on the open issues listed in R1-103142.

5.7 Other

R1-102625	Improved uplink load balancing for MC-HSPA	Ericsson, ST-Ericsson	

The document was presented by Johan Hultell from Ericsson and deals with concepts aiming at improving load balancing in multi-carrier systems.

- "fast primary cell change" concept may have significant impact; both with respect to the specifications and the design principles of MC-HSPA in Rel-8/9 (e.g., mobility). IFHO involving the primary carrier should remain under the control of the RNC. As a potential improvement to the existing procedures dedicated NBAP/RNSAP signalling that allows the serving Node-B to suggest an IFHO to the RNC could be considered.
- "fast secondary cell change" concept will have moderate impact on specifications and system operations. At the same time similar or even larger gains than those associated with a fast primary cell change can be achieved. Preferred option if it is decided to introduce support for fast Node-B initiated load balancing.

Decision: The document is noted.

R1-102931	Concept of UL Closed Loop Transmit Diversity	Huawei	

The document was presented by Yang Bo from Huawei and deals with UL closed loop transmit diversity scheme which is based on explicit uplink channel estimation and CSI feedback. The simulation result show considerable average UE throughput gains over the basic 1x2 system. On PA3 channel, the average gain reaches 14% and on VA30 channel, it is up to 10%. The paper concludes that CLTD is a valuable complement that should be further considered for improving the HSPA uplink.
Decision: The document is noted.

6 E-UTRA

6.1 Maintenance of E-UTRA Releases 8 – 9

R1-102679	36.213 CR0268 (Rel-9,F) Clarification of PRS EPRE	Ericsson, ST-Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Qualcomm Inc	

The document was presented by Daniel Larsson from Ericsson and defines the PRS EPRE constant across a PRS occasion as requested by RAN4 LS in R1-103298.
Discussion (Question / Comment): Reference to linked CR to 36.133 shall be added to coversheet.
Decision: The document is noted. Updated CR is to be prepared in R1-103354.
Monday afternoon:

R1-103354	36.213 CR0268R1 (Rel-9,F) Clarification of PRS EPRE	Ericsson, ST-Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Qualcomm Inc	(R1-102679)

Decision: The document is noted and CR is agreed.

R1-103301	36.214 CR0015R1 (Rel-9,F) Clarification of RSTD measurement	Ericsson, ST-Ericsson, Huawei	(R1-102680)

The document was presented by Daniel Larsson from Ericsson and is a linked CR to 36.355 to remove ambiguity and defines that Cell j is refered to as a neigbour cell and cell i is refered to as a reference cell.
Discussion (Question / Comment): Alcatel Lucent commemted that it is very unlikely to have ambiguity in UE location computation.
Decision: The document is noted and CR is agreed.

R1-103305	Discussion on MBMS capability	Panasonic	

The document was presented by Hidetoshi Suzuki from Panasonic and summarizes different understandings on MBMS capability on release 9. The document does not propose single solution but proposes to continue the discussion off line based on the different options listed in the document.
Discussion (Question / Comment): .
Decision: The document is noted. More off line discussion is needed.

6.2 Carrier Aggregation

6.2.1 PCFICH

R1-102933	Summary of email discussion on PCFICH	Nokia	

The document was presented by Asbjørn Grøvlen from Nokia and shows the outcomes of email thread under [60bis-01-LTE-A]. The conclusion shows a clear preference for Alt.1, but even split between companies when it comes to RRC vs. DCI signaling.
Alt.1= in case of cross-carrier scheduling, the UE shall always follow the "newly-standardized solution" for ascertaining the PDSCH starting position on the CC carrying the PDSCH.
Decision: The document is noted.

R1-103306	Way Forward on PDSCH starting position indication with cross-carrier scheduling	Panasonic, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, NTT DOCOMO, LGE, Huawei, NEC, ZTE, Philips, Pantech, Sharp, HTC	

The document was presented by Akihiko Nishio from Panasonic and proposes:

- Use DCI for the PDSCH starting position indication for cross carrier scheduling
- UE shall always follow the PDSCH starting position indicated in the DCI in case of cross carrier scheduling

Discussion (Question / Comment): Such method if agreed implies to understand how the DCI signalling will be done, said Nokia. Ericsson thanked sourcing companies for providing more detailed inputs for discussion but the "WF" is rather straight forward from the email summary.
Decision: The document is noted.

R1-103366	WF on DCI based indication of PDSCH starting position with cross carrier scheduling	Panasonic, NTT DoCoMo, Huawei, Philips, ZTE	

The document was presented by Akihiko Nishio from Panasonic and provides further details w.r.t PDSCH starting symbol position values coded in CIF field.

R1-102605	Further discussion on PCFICH for carrier aggregation	Ericsson, ST-Ericsson	

The document was presented by Daniel Larsson from Ericsson and deals with scenarios for cross-carrier scheduling and how much dynamic is needed in these environments to indicate the start position of a cross-carrier scheduled PDSCH. It is proposed:

- Adopt Alt. 1 to indicate start position of cross-carrier scheduled PDSCH to UE.
- RRC signaling is used to indicate start position of cross-carrier scheduled PDSCH to UE.

Discussion (Question / Comment): .
Decision: The document is noted.

From the discussion

- Baseline:
  - Signalling of one value by RRC, with Alt 1.
- Further study until RAN1#61bis on:
  - whether other solutions are necessary
  - whether more than one value (for different sets of subframes) signalled by RRC is necessary (ultimately the responsibility of RAN2 – LS would be sent to RAN2).

Not treated.

R1-102640	Issues on PCFICH detection in LTE-A	CATT	
R1-102707	PDSCH Starting Symbol Indication for Cross-Carrier Scheduling	LG Electronics	
R1-102738	PCFICH for CA operation	Qualcomm Incorporated	
R1-102815	Views on PCFICH detection in LTE-A	Texas Instruments	

R1-102851	PCFICH in cross carrier operation	Panasonic	Update of R1-102013
R1-102889	PCFICH detection error cases and handling	ZTE	
R1-102932	PCFICH Issues with Cross-Component Carrier Scheduling	Nokia Siemens Networks, Nokia	
R1-102979	Indication of starting symbol in PDSCH in a cross-scheduled carrier	HTC	
R1-103052	Cross-carrier CFI signalling	NEC Group	
R1-103082	PCFICH on Cross-Carrier scheduling	Huawei	
R1-103167	PCFICH in Carrier Aggregation	Motorola	
R1-103201	Cross-carrier control region indication	Sharp	R1-102391
R1-103243	PCFICH for Cross-carrier Assignment	NTT DOCOMO	
R1-103359	On the PCFICH detection in cross-carrier scheduling	Pantech	(R1-102833)
R1-103360	On the cross-carrier CFI signaling by PDCCH	Pantech	(R1-102834)

6.2.2 PHICH

Not treated.

R1-102606	On PHICH for carrier aggregation	Ericsson, ST-Ericsson	
R1-102641	PHICH collision in LTE-A	CATT	
R1-102708	PHICH Resource Mapping in Carrier Aggregation	LG Electronics	
R1-102739	PHICH for CA operation	Qualcomm Incorporated	
R1-102780	PHICH resource allocation in LTE-A	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-102812	PHICH collision handling for carrier aggregation	Intel Corporation (UK) Ltd	
R1-102890	Views for PHICH collision issue	ZTE	
R1-102934	PHICH mapping for SPS	Nokia, Nokia Siemens Networks	(R1-101879)
R1-102993	PHICH Resource Indexing with UL CA	Samsung	
R1-103060	Views on LTE-A PHICH collision handling	NEC Group	
R1-103159	PHICH Resource Selection for LTE-A	Motorola	
R1-103202	Handling PHICH collisions in Carrier Aggregation	Sharp	(R1-102392)

6.2.3 PDCCH

6.2.3.1 Linkage between PDSCH/PUSCH and PDCCH

Cost/benefit of extending option 1

R1-102740	Advantages of modified option 1 and relation with search space sharing	Qualcomm Incorporated	

The document was presented by Wanshi Chen from Qualcomm and deals with the linkage between for DL control and CC for DL and UL data. Both modified option 1 and search space sharing for the same DCI size in case of cross-carrier

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signalling bring the benefit of increased scheduling flexbility at no additional cost. It is proposed to adopt search space sharing regardless of whether the search spaces are located on the same CC or different CCs.
Discussion (Question / Comment): .
Decision: The document is noted.

R1-102994	Linkage between PDCCH and PDSCH/PUSCH with Cross-Carrier Scheduling	Samsung	

The document was presented by Aris Papasakellariou from Samsung and provides further cost/benefit analysis that shows only supporting "Option 1" is sufficient.
Discussion (Question / Comment): .
Decision: The document is noted.

Agreement: WA for option 1 is confirmed for Rel-10.

R1-103402	Draft LS on linkage between PDCCH and PDSCH/PUSCH with cross carrier scheduling	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Mrs Jungah Lee from Alcatel-Lucent.
Discussion (Question / Comment): CATT asked for more time to look at this LS.
Decision: The document is noted. To be revisited after Friday morning coffee break.
Discussion (Question / Comment): The figure doesn't help too much to the understanding and some companies suggested removing it. Qualcomm suggested also removing the sub-bullet "*For any DL carrier with CIF where the UE monitors PDCCH, PDCCH on the DL carrier shall be able to schedule PDSCH at least on the same carrier and/or PUSCH on a linked UL carrier*", only main bullet is relevant to RAN2 at this stage. Ericsson commented that we're now changing the agreements RAN1 made.
Decision: The document is noted and final LS is agreed in R1-103414.

Note final text of agreement:

- Each PDSCH/PUSCH CC can be scheduled only from a single DL CC, i.e. the UE only monitors PDCCH on one DL CC for each PDSCH/PUSCH CC
    - For any DL carrier where the UE monitors PDCCH with CIF, PDCCH on the DL carrier shall be able to schedule PDSCH at least on the same carrier and/or PUSCH on a linked UL carrier

Other

Not treated.

R1-102995	Handling of linkage between UL CC and deactivated DL CC	Samsung	
R1-103299	DL component carrier grouping	Fujitsu	(R1-103216)

6.2.3.2 Blind decoding and search spaces

Number of blind decodes

R1-102607	Summary of email discussion on blind decodes	Ericsson	

The document was presented by Dirk Gerstenberger from Ericsson and summarizes the email thread under [60bis-02-LTE-A].
Discussion (Question / Comment): NSN confirmed that the blind decodes shall be specified per CC so that the number of blind decodes always is proportional to the number of activated CCs on which the UE is monitoring PDCCH → they do not support second bullet in proposal 1.2. Same position expressed by Qualcomm.
Decision: The document is noted.

R1-102608	On PDCCH blind decoding	Ericsson, ST-Ericsson	

The document was presented by Daniel Larsson from Ericsson and proposes the following:

- A UE that only supports carrier aggregation, supports a maximum number of 44 blind decodes for a single DL component carrier or a single pair of DL and UL component carrier.
- Uplink MIMO should be supported by introducing a transmission mode in the UL with a new DCI format that is only transmitted in the UE specific search space on PDCCH and is not bit aligned to any DCI format.

- Non-contiguous resource allocations should not require any additional blind decodes on PDCCH compared to the corresponding contiguous resource allocation case.
- The number of utilized blind decodes is 44 times the number of active DL component carriers or pairs of DL and UL component carriers in case the UE does not support or is not configured for UL MIMO on the associated UL component carrier.
- The number of utilized blind decodes is 60 times the number of active pairs of DL and UL component carriers in case the UE is configured for UL MIMO on the associated UL component carrier.

Decision: The document is noted.

R1-102741	Search space and blind decodes for CA	Qualcomm Incorporated	

The document was presented by Wanshi Chen from Qualcomm and proposes the following:

- The maximum number of blind decodes for a single carrier operation is 44, following the Rel-8 specification
- The maximum overall number of blind decodes across carriers is M*X, where M is the number of UE supported carriers as defined by its capability, and X is the number of blind decodes for single CC operation
- It is allowed that more than one search space can be used/shared for scheduling of a PDSCH/PUSCH
- Define and utilize a UE PDCCH monitoring set as the subset of configured carriers for PDCCH monitoring. Only the carriers from the PDCCH monitoring set carry assignments for the UE.
- For any CC carrying PDCCH, the starting CCE indices for all the aggregation levels corresponding to its own UE-specific search space follow the same LTE Rel-8 design. For a CC carrying cross-carrier PDCCH, search spaces for other CCs can be specified relative to the given CC via some offsets, with the details FFS.

Decision: The document is noted.

R1-103064	Blind Decoding and search space for Carrier Aggregation	Research In Motion UK Limited	

The document (focused on section 2) was presented by Ms Youn Heo from RIM and proposes the following two approaches for the number of blind decodes:

- Approach 1: Different maximum number of blind decodes s per CC could be defined depending on the supported number of DL/UL CCs.
- Approach 2: Different maximum number of blind decodes per CC could be defined depending on the supported overall system bandwidth.

Decision: The document is noted.

R1-103084	PDCCH blind decoding in LTE-A	Huawei	

The document was presented by Ms Elean Fan from Huawei and concludes:

- Upper limit on total number of blind decodes = $N \times X$, where N is the maximum number of simultaneous aggregated DL CCs that a UE's baseband processor supports, X is the maximum number of BDs per CC in the scenario of same-CC scheduling.
  - X=60 is preferred at least for UL SU-MIMO.
- The maximum number of BDs in operation, i.e. the current configurable maximum number of BDs for a UE, could be configured by the eNB.

Decision: The document is noted.

Agreements:

- Number of blind decodes for single carrier operation
  - Single carrier operation without MIMO or non-contiguous resource allocation: X = 44
  - Non-contiguous resource allocation: X = 44
  - UL MIMO: FFS
  - FFS: need for further reducing the number of blind decodes.
- Relation between actual number of blind decodes to the number of active/configured/supported CCs:
  - actual number of blind decodes depends on the number of active CCs

Working Assumptions:

- Actual number of blind decodes (on the assumption that N_DLCC >= number of active UL CCs (to be checked!)):
  - 44 x N_DLCC for UE which is not configured with UL MIMO
    - where N_DLCC is the number of active DL CCs
  - 44 x N_DLCC + Y x N_ULCC_M for UE which is configured UL MIMO
    - where N_ULCC_M is the number of active CCs which are configured for UL MIMO.

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- Y is one of 0 and 16 (FFS which one)

Discuss the need for further reducing the number of blind decodes.
Discuss the need for configuring the actual number of blind decodes.

Check RAN2's discussions on number of common search spaces the UE has to monitor on different SCCs.

Blind decoding reduction methods

R1-103168	Blind decoding and search spaces for Carrier Aggregation	Motorola	

The document was presented by Ravikiran Nory from Motorola and proposes the following:
- To reduce over all number of BDs, UE monitors CSS only the PCC and obtains other CC system information via RRC signaling on PCC. A Release 10 and beyond UE shall be capable of performing 60 BD on at least one of its active component carriers.
- Non-contiguous PUSCH resource allocation transmission mode should be supported only in CA UE categories. Type 0/1 RA modes can be reused.

Decision: The document is noted.

R1-102935	Handling DCI formats and blind decoding in LTE-Advanced	Nokia, Nokia Siemens Networks	(R1-101880)

The document was presented by Lars Lindh from Nokia and deals with using the Release 8 blind decoding –based approach in LTE-Advanced for distinguishing DCI formats especially when extending the bandwidths and adding new DCI formats. A potential modification to the principle of handling of DCI formats and blind decoding in LTE-Advanced that overcomes most of the problems is proposed.
Decision: The document is noted.

R1-102709	Blind Decoding Reduction Methods	LG Electronics	

The document was presented by … from LGE and proposes the followings:
- The DCI format size adaptation over restricted DCI payload sizes should be considered for BD reduction.
- Padding should be considered for the DCI size adaptation. Details of the number of containers and the exact padding overhead in each container should be further investigated.

Decision: The document is noted.

R1-103085	PDCCH design to reduce the convolutional decoding numbers on DSS	Huawei	

The document was presented by Wu Yu-Chun from Huawei and proposes a PDCCH design made up of two parts, with Part I consisting DCI index and Part II consisting DCI content as in Rel-8. Both parts are encoded separately and scrambled by part or all UE-specific RNTI respectively.
Discussion (Question / Comment): Huawei requested an email discussion to be set-up. Mr Chairman replied this was premature at this stage but company are welcome to discuss all together on any new technics.
Decision: The document is noted.

Not treated.

R1-102689	Structure of PDCCH search space for multiple carrier aggregation	LG Electronics	
R1-102690	Handling of search space overlap in case of cross-carrier scheduling	LG Electronics	
R1-102710	Per-CC UE-specific Search Space Configuration Methods for Cross-carrier Scheduling	LG Electronics	
R1-102711	Clarification on DRX Details in RAN2 LS for PDCCH Monitoring CC Set	LG Electronics	
R1-102811	PDCCH Search Space Design	Intel Corporation (UK) Ltd	
R1-102852	Search space for cross carrier scheduling	Panasonic	Update of R1-102016
R1-102892	PDCCH blind decoding and search space for carrier aggregation of LTE-A	ZTE	

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R1-102936	Considerations on alternative ways of implementing DCI formats for LTE-Advanced	Nokia, Nokia Siemens Networks	(R1-101881)
R1-102937	On UE specific search space definitions for cross-CC scheduling for carrier aggregation	Nokia, Nokia Siemens Networks	
R1-102989	Discussion on shared search spaces in carrier aggregation	Potevio	
R1-102990	Search spaces design in carrier aggregation	Potevio	
R1-102996	PDCCH Search Space Design for CA	Samsung	
R1-103083	Search spaces on one CC for the cross-CC scheduling	Huawei, CMCC	
R1-103217	UE-specific search space location offset across DL component carriers	Fujitsu	
R1-103218	Search space size extension	Fujitsu	
R1-103245	UE-specific Search Space for Carrier Aggregation	NTT DOCOMO	
R1-103246	Investigation on UE-specific Search Space for Carrier Aggregation	NTT DOCOMO	

Search space design for cross-carrier scheduling

R1-103347	Summary of email discussion on the PDCCH search space design	LGE	

The document was presented by Joon Kui Ahn from LGE and summarizes the outcomes of the email thread under [60bis-03-LTE-A].
Discussion (Question / Comment): TI noted that TI's views have not been included in although they were (may be too late) submitted over the reflector.
Decision: The document is noted.

Agreements:

- For a given UE, search spaces located on a PDCCH CC are individually defined per aggregation level for each PDSCH/PUSCH CC linked to the PDCCH CC
- A UE's search spaces on a PDCCH CC are shared in case of same DCI size

Discuss further the details of search space design including the placement of CC-specific search spaces in a CC on which the UE monitors the PDCCH.

6.2.3.3 Configuration/reconfiguration of CIF

Not tretated.

R1-102712	Uncertain Period Handling for CIF Initialization and Release	LG Electronics	
R1-102713	Uplink CC-to-CI Mapping for Carrier Aggregation	LG Electronics	
R1-102714	Carrier index (CI) configuration per UE for Carrier Aggregation	LG Electronics	
R1-102742	Configuring and reconfiguring CIF	Qualcomm Incorporated	
R1-102853	CIF reconfiguration issue	Panasonic	Update of R1-102017
R1-102938	Reconfigurations and search space overlap conflicts	Nokia Siemens Networks, Nokia	
R1-102980	CIF configuration and reconfiguration	HTC	
R1-102997	Confusion Between DCI Formats for Different CCs, Tx Modes and Bandwidths	Samsung	

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R1-102998	CIF Configuration	Samsung	
R1-103065	Remaining issues for cross-carrier scheduling	Research In Motion UK Limited	
R1-103086	Analysis of solutions for handling DCI format ambiguity between CSS and UESS at cross-carrier scheduling	Huawei, CMCC	
R1-103247	UE-specific Search Space During CIF Reconfiguration	NTT DOCOMO	
R1-103289	Remaining issues on carrier indicator field	ZTE	(R1-102891)
R1-103303	Discussion on remaining issues for CIF in LTE-A	CATT	(R1-102642)
R1-103365	Review of CIF Reconfiguration	Philips	(R1-102982)

6.2.3.4 Other

Not treated.

R1-102715	Consideration on CI-to-CC Reconfiguration	LG Electronics	
R1-102999	DAI design for LTE-A TDD	Samsung	

6.2.4 PUCCH

6.2.4.1 Method(s) for A/N multiplexing

Friday 14th

R1-103396	Way forward on support of channel selection	Panasonic, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, NTT DOCOMO, Samsung, Nokia Siemens Networks, Nokia, Fujitsu, ETRI, Motorola, ZTE, Qualcomm, Ericsson, ST-Ericsson, InterDigital	

The document was presented by Seigo Nakao from Panasonic.

- In release 10, channel selection is supported as ACK/NAK transmission scheme on PUCCH for up to N bits ACK/NAK. The exact scheme will be selected from one of the following
  - Channel selection based on PUCCH format 1a/b only
  - Channel selection using SF=2,4
  - RS Enhanced channel selection
  - Channel selection with multiple sequences
- In release 10, an enhanced ACK/NACK transmission scheme on PUCCH is also supported, at least for the case of >N bits ACK/NACK. The exact scheme will be selected from one of the following
  - Based on PUCCH format 2
  - DFT-S-OFDM based
  - Multi-sequence modulation
  - 2xPUCCH in adjacent PRBs
- FFS: the exact number of N : N is one of {3,4,5,6}

Discussion (Question / Comment): TI asked clarification whether both FDD and TDD are covered → yes.
Samsung raised that current mapping for N=4 with channel selection is a problem.
NTT DoCoMo don't think the channel selection may increase the PUCCH overhead.
CATT agreed with LGE, doesn't see any reason for "channel selection with multiple sequences"
Ericsson explained that the position was to agree on first bullet as a short term solution, then go later on towards a long term solution.
Decision: The document is noted. Mr Chairman then decided to look at evaluation results.
Evaluation results

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R1-102612	Evaluation of PUCCH proposals for carrier aggregation	Ericsson, ST-Ericsson	

The document was presented by Daniel Larsson from Ericsson and provides the performance evaluation of ACK/NACK transmission in the uplink for carrier aggregation in terms of payload size, PUCCH formats and resource sizes. It is proposed that:

- Simultaneous transmission of multiple PUCCH channels is not supported for Rel-10 LTE.
- A PUCCH format based on DFT-S-OFDM for transmission of multiple ACK/NACK in the context of carrier aggregation is adopted for Rel-10 LTE.

Discussion (Question / Comment): Ericsson informed of additional results in R1-103367 for further performance comparison of various Format 2 PUCCH modification proposals and DFT-S-OFDM based PUCCH.
Decision: The document is noted.

R1-103367	Evaluation of Carrier Aggregation PUCCH Proposals with Advanced Receivers	Ericsson, ST-Ericsson	

The paper recommends to adopt a PUCCH format based on DFT-S-OFDM and slow codebook adaptation for transmission of multiple ACK/NACK in the context of carrier aggregation in Rel-10 LTE.
Decision: The document is noted.

R1-102743	Link comparison of multi UL-ACK transmission schemes in support of CA	Qualcomm Incorporated	

The document was presented by Xiliang Luo from Qualcomm and proposes the following for ACK multiplexing:

- PUCCH format 1b with SF reduction to 2 is used to convey 4-6 HARQ-ACK bits
  - Channel selection is utilized in conjunction with SF reduction
    - For 4 or 5 HARQ-ACK bits, we need a total of 4 Rel-8 orthogonal resources (1-bit channel selection)
    - For 6 HARQ-ACK bits, we need a total of 8 Rel-8 orthogonal resources (2-bit channel selection)
- FFS the scheme to use for multiplexing 7 or more HARQ-ACK bits considering performance, multiplexing capability and implementation/specification complexity

Decision: The document is noted.

R1-102643	UL ACK/NACK Mulitplexing methods for LTE-A	CATT	

The document was presented by Zukang Shen from CATT and compares the ACK/NAK BER performance of different transmission schemes. The current results indicate that PUCCH format 2 performs relatively well for ACK/NAK payload size up to 10 bits, assuming the sixth column of the RM base vectors is not used.
Decision: The document is noted.

R1-102716	Performance Comparisons of CA PUCCH Formats	LG Electronics	

The document was presented by … from LGE and provides simulation results showing that DFT basis with CDM/FDM is a good choice in overall A/N bit region. Particularly for <= 4 A/N bits, SF reduction is also good choice considering both the performances and the resource overhead. Two options are suggested:

- Option 1: Introducing total two CA PUCCH formats for simplicity
  - Rel-8 PUCCH format 1a/1b for backward compatibility to support up to 2 A/N bits
  - DFT basis with FDM=2
- Option 2: Introducing total three CA PUCCH formats to further optimize the performances in particular ranges
  - Rel-8 PUCCH format 1a/1b for backward compatibility to support up to 2 A/N bits
  - SF reduction in small A/N bit size (eg. from 2 to 4)
  - DFT basis with FDM=2 for other ranges

Decision: The document is noted.

R1-102907	Evaluation of AN multiplexing for Carrier Aggregation	ZTE	

The document was presented by … from ZTE and propose two modes for ACK/NACK feedback:

- Bundling mode should be supported, at least for coverage limited UE(s).
  - Bundling across CCs/spatial/subframes should be applied.
  - DAI mechanism should be taken into account.
- Multiplexing mode
  - For small to medium payload size: channel selection with format 1b is applied.
    - Mapping table for M = 5 should be considered to support up to 5 DL CCs.

- The value of M is equal to the number of configured DL CCs.
- For larger payload size: PUCCH format 2 is used.
  - Full state feedback can be supported for FDD (but it should not be mandatory since spatial bundling can also be applied.)
  - Spatial bundling and no explicit DTX should be considered for TDD.
  - The number of ACK/NACK bits for feedback is based on the number of configured DL CCs and DL subframes.

Decision: The document is noted.

R1-103001	PUCCH HARQ-ACK Signal Transmission with DL CA in Rel-10 FDD	Samsung	

The document was presented by Aris Papasakellariou from Samsung and proposes the folowing:

- Channel selection is used for HARQ-ACK payloads up to 4 bits.
- PUCCH format 2 is used for HARQ-ACK payloads above 4 bits.
- HARQ-ACK sub-frame bundling is used for TDD.

Decision: The document is noted.

R1-103269	Link-level evaluation of PUCCH proposals for Carrier Aggregation	InterDigital Communications, LLC	

The document was presented by Marian Rudolf from InterDigital and proposes the following working assumptions:

- When A/N corresponding to a single received DL assignment on the Primary Cell is sent by the UE, R8 PUCCH Type 1 and the R8 dynamic resource assignment rule are used.
- When 2 or more DL CC's are configured, the R10 PUCCH Format(s) depend on the number of configured DL CC's irrespective of the number of DL assignments decoded in that subframe by the UE.
- For the case of 2 or more configured DL CC's, R10 FDD supports two configuable PUCCH Format(s), e.g. a first PUCCH format supporting transmission of 5 or less A/N bits, and a second format supporting transmission of 6 or more A/N bits per subframe.

Decision: The document is noted.

R1-103270	System-level evaluation of PUCCH proposals for Carrier Aggregation	InterDigital Communications, LLC	

The paper proposes that, for the case of 2 or more configured DL CC's, R10 FDD supports two configuable PUCCH Format(s), e.g. a first PUCCH format supporting transmission of 5 or less A/N bits, and a second format supporting transmission of 6 or more A/N bits per subframe.

Decision: The document is noted.

R1-103361	Analysis and evaluation of extended channel selection	Huawei	(R1-103277)

The document was presented by Fredrik Berggren from Huawei and proposes that extended channel selection, utilizing ACK/NACK and DMRS sequence selection, is supported for ACK/NACK transmission in case of carrier aggregation.

Decision: The document is noted.

R1-103412	Way forward on support of channel selection	CATT, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, NTT DOCOMO, Samsung, Motorola, Ericsson, ST-Ericsson, InterDigital, Texas Instruments	

The document was presented by Zukang Shen from CATT who commented that very likely the tittle should have been reworded.

Discussion (Question / Comment): Qualcomm expressed disappointment for the restriction compare to the original WF in R1-103396 (supported by more companies). Nokia agreed, as it is not necessary to preclude options and narrowing down the potential schemes. Ericsson commented that it is a good step forward.

Decision: The document is noted. No consensus could be made. Further email discussions until next meeting covering simulation assumptions and merits / demerits of different schemes and aiming to narrow down the list of schemes under consideration. Decision on PUCCH format shall be taken at RAN1#61bis.

In order to capture the long discussion, the following WF was given a Tdoc [R1-103415] to help further the exchanges over the reflector

R1-103415	Way forward on PUCCH for CA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, ETRI, Fujitsu, Huawei, InterDigital, Nokia, NSN, NTT DoCoMo, Panasonic, Qualcomm, Samsung, ZTE	

Decision: The document is noted as follows:

- In release 10, channel selection is supported as ACK/NAK transmission scheme on PUCCH for up to *N* bits ACK/NAK
  - The exact scheme will be selected from one of the following
    - Channel selection based on PUCCH format 1a/b only
      - FFS on redesigning the mapping table for M=4
    - Channel selection using SF=2,4
    - RS Enhanced channel selection
    - Channel selection with multiple sequences
- In release 10, another ACK/NACK transmission scheme on PUCCH is also supported, at least for the case of >*N* bits ACK/NACK
  - The exact scheme will be selected from one of the following
    - Based on PUCCH format 2
    - DFT-S-OFDM based
- FFS: the exact number of *N*: *N* is one of {4,5}

Email discussion until RAN1#61bis - Rapporteur Tim Moulsley (Philips).

Not treated.

R1-102611	PUCCH design for carrier aggregation	Ericsson, ST-Ericsson	
R1-102613	On ACK/NACK codebook performance for carrier aggregation	Ericsson, ST-Ericsson	
R1-102644	DAI Design for LTE-A	CATT	
R1-102781	PUCCH A/N channel design in LTE-A	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-102854	Support of multiple ACK/NACK transmission schemes	Panasonic	
R1-102855	ACK/NACK transmission schemes for carrier aggregation	Panasonic	Resubmisison of R1-102021
R1-102856	Support of UL ACK/NACK channel selection for carrier aggregation	Panasonic	Resubmisison of R1-102022
R1-102857	Support of UL ACK/NACK bundling across CC for carrier aggregation	Panasonic	Resubmisison of R1-102023
R1-102939	UL ACK/NAK Feedback for Power-Limited UE in LTE-A TDD	Nokia, Nokia Siemens Networks	
R1-102940	UL ACK/NAK Feedback in LTE-A TDD	Nokia, Nokia Siemens Networks	(R1-101886)
R1-102941	Evaluation of UL ACK/NAK Bundling Ways in LTE-A TDD	Nokia, Nokia Siemens Networks	(R1-101887)
R1-102942	On the need for cross-carrier A/N bundling	Nokia Siemens Networks, Nokia	
R1-102943	On the PUCCH Resource Allocation and A/N Codebook Size for Carrier Aggregation	Nokia Siemens Networks, Nokia	
R1-103000	Discussion on ACK/NACK transmission method for LTE-A TDD	Samsung	
R1-103002	UL HARQ-ACK Resource Indexing Mapping with DL CA	Samsung	
R1-103087	Overview of UL ACK/NACK feedback design issues for carrier aggregation	Huawei	
R1-103088	A/N Codebook Design with DTX for Carrier Aggregation	Huawei	
R1-103157	Uplink ACK/NACK Transmission Format for Carrier Aggregation	Motorola	

R1-103194	Channel Selection Methods for ACK/NACK Transmission in CA	ETRI	
R1-103195	PUCCH ACK/NAK multiplexing and resource allocation for carrier aggregation	ETRI	
R1-103248	Uplink ACK/NACK Transmission Schemes for Carrier Aggregation	NTT DOCOMO	
R1-103249	Uplink ACK/NACK Resource Assignments for Carrier Aggregation	NTT DOCOMO	
R1-103397	ACK/NACK resource allocation in LTE-A	LG Electronics	(R1-102691)

6.2.4.2 Transmit diversity

Not treated.

R1-102645	PUCCH Format 1/1a/1b Resource Allocation with SORTD	CATT	
R1-102717	Resource Allocation for SORTD	LG Electronics	(R1-102372)
R1-102744	UL-ACK resource allocation for DL transmission with single CCE and UL TxD	Qualcomm Incorporated	
R1-102859	SORTD configurations for ACK/NACK information and SRI	Panasonic	Resubmisison of R1-102025
R1-102860	PUCCH resource indication for SORTD and carrier aggregation	Panasonic	Update of R1-102024
R1-102944	SORTD resource allocation	Nokia Siemens Networks, Nokia	
R1-103003	Transmit Diversity for PUCCH Format 1/1a/1b	Samsung	
R1-103089	SORTD resource allocation for PUCCH format 1a/1b	Huawei	

6.2.4.3 Other

Not treated.

R1-102646	ACK/NAK bundling for FDD with CA	CATT	
R1-102647	PUCCH resource allocation for CA	CATT	
R1-102648	CQI feedback for LTE-A	CATT	
R1-102692	UCI piggyback onto PUSCH in for carrier aggregation	LG Electronics	
R1-102745	CQI for CA	Qualcomm Incorporated	
R1-102746	UCI transmission for CA	Qualcomm Incorporated	
R1-102861	Periodic CQI Reporting for Carrier Aggregation	Panasonic	Update of R1-102028
R1-102862	Simultaneous transmission of Scheduling request indicator and ACK/NACK information for LTE-Advanced	Panasonic	Resubmisison of R1-102026
R1-102863	Discussion on various UL transmission configurations	Panasonic	Update of R1-102027
R1-102945	On the PUCCH Multiplexing Combinations for CA	Nokia Siemens Networks, Nokia	
R1-103004	Concurrent transmission of SR indicator and ACK/NACK information for LTE-A	Samsung	
R1-103005	CSI Feedback Signaling in Rel-10	Samsung	
R1-103067	UCI transmission in the presence of UL-SCH data	Research In Motion UK Limited	

R1-103090	CQI/PMI/RI reporting for carrier aggregation	Huawei	

6.2.5 UL Power Control

6.2.5.1 Pathloss derivation

Not treated.

R1-102614	Pathloss derivation for carrier aggregation	Ericsson, ST-Ericsson	
R1-102747	Pathloss derivation for open loop correction	Qualcomm Incorporated	
R1-102782	Pathloss offset signalling for non-contiguous carrier aggregation	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-103006	Path-Loss Derivation for CA	Samsung	
R1-103091	Pathloss derivation for UL PC in LTE-A	Huawei	

6.2.5.2 Power headroom reporting

R1-103291	Power headroom reporting for carrier aggregation	Ericsson, ST-Ericsson	(R1-102615)

The document was presented by Dirk Gerstenberger from Ericsson and proposes that an individual PUCCH Power Headroom Reporting (PHR) is reported in the subframe where the corresponding PUSCH PHR is reported, together with information about the number of bits and the format of the latest PUCCH transmission.
Discussion (Question / Comment): Number of required bits is FFS.
Decision: The document is noted.

R1-102649	Considerations on power headroom report in LTE-A	CATT	

The document was presented by Zukang Shen from CATT and draws the following proposals:

- In a reference subframe i for PHR, a Rel-10 UE shall calculate and report a combined PHR as $PHR(i) = P_{\text{CMAX}} - P_{PUSCH}(i) - P_{PUCCH}(i)$ in case both PUCCH and PUSCH are present; otherwise, UE shall calculate and report a PHR as $PHR(i) = P_{\text{CMAX}} - P_{PUSCH}(i)$.
- An aperiodic PHR triggering scheme via L1 or L2 signaling can be introduced in Rel-10.

Discussion (Question / Comment): Ericsson and CATT seem to have different understanding of Pcmax. Ericsson commented that RAN2 is having discussion on PHR triggering that might not be in line with this proposal.
Decision: The document is noted.

R1-102693	Remaining issues about power headroom reporting for LTE-A	LG Electronics	

The document was presented by Joon Kui Ahn from LGE and suggests:

- In concurrent transmission case, regardless of whether UE is configured as 'Absolute mode' or 'Accumulation mode' for PUSCH TPC, UE report both PUSCH PH and PUCCH PH to its serving eNB. It should be decided further whether PUSCH PH and PUCCH PH are always reported or reported only when PUCCH and PUSCH are transmitted concurrently.
- In PUCCH piggyback case, UE only transmit PUSCH PH as in LTE.
- Cross carrier transmission of PHR can be investigated.

Decision: The document is noted.

R1-102732	Power Headroom Reporting	HTC	

The document was presented by Elliot Jen from HTC, focusing on the differences from other already presented contributions. The paper proposes to choose between the following PHR formats:

- Specific PHR format: Individual PUCCH PHR is reported in a specific PHR format, where UE shall report the latest PUCCH PHR or a predefined PHR;
- Dynamic PHR format: PHR format indicator indicates whether latest PUCCH PHR is included.

In addition, the paper also proposes to choose between the following two alternatives:
- Individual PUCCH PHR is reported on the configured UL CC;
- Individual PUCCH PHR is reported on any UL CC with available PUSCH grant.

Decision: The document is noted.

R1-102748	Reporting of power headroom	Qualcomm Incorporated	

The document was presented by Alex Damnjanovic from Qualcomm and proposes that the UE computes separate power headroom reports for PUSCH and PUCCH. Coding optimizations are for further study.
Decision: The document is noted.

R1-102783	Power headroom reporting for carrier aggregation	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	

The document was presented by Mrs Jungah Lee from Alcatel Lucent and draws the following conclusions:
- Power headroom report for PUCCH and/or PUSCH in addition to the power headroom reporting per CC could be configured by the eNB for PCC
- The CC-specific power headroom reporting should remain the same regardless of whether single or multiple PAs are used at the UE.

Decision: The document is noted.

R1-102817	On Power Headroom Reporting for Carrier Aggregation	Texas Instruments	

The document was presented by Anthony Ekpenyong from TI and states that for concurrent PUSCH/PUCCH transmission a composite PHR is sufficient with a possible extension of the PH range and/or a one-bit field to indicate whether the PHR accounts for PUCCH transmission power.
Decision: The document is noted.

R1-102946	Power headroom reporting for uplink carrier aggregation	Nokia Siemens Networks, Nokia	

The document was presented by Jari Lindholm from NSN and makes the following observations and proposals:
- No need to introduce separate PUSCH and PUCCH power headroom reports for the PCC.
- PHR is only reported for the CC(s) where PUSCH transmission actually occurs in the corresponding TTI.
- Observation: The PHR mechanism standardized to support UL CC in Rel-10 should provide the eNodeB with information on the available power headroom at the UE, independently on whether the limitation comes from the CC-specific or from the UE-specific maximum transmission power.
- RAN1 should discuss on the advantages and disadvantages of different PHR mechanisms that also take into account limitations due to UE-specific maximum transmission power, and possibly agree on a way forward which favours solutions that are still requiring at maximum one PHR per CC.

Decision: The document is noted.

Not formally reviewed during the session.

R1-102908	Power Headroom Reporting for Carrier Aggregation in LTE-Advanced	ZTE	
R1-103007	PUSCH/PUCCH power headroom reporting	Samsung	
R1-103066	PH reporting for Carrier Aggregation	Research In Motion UK Limited	
R1-103092	PHR for UL PC in LTE-A	Huawei	
R1-103189	Power headroom report in LTE-A	ASUSTeK	
R1-103203	Separate power headroom reporting for PUCCH and PUSCH in LTE-A	Sharp	R1-102397

Agreements:
- PHRs for the following cases will be provided:
  - Type 1: P_cmax minus PUSCH power
  - Type 2: P_cmax minus PUCCH power minus PUSCH power
- MPR is taken into account
- The following will not be discussed further in RAN1 unless requested by RAN2:

- triggers for PHR
- whether the two types of PHR are always sent in the same subframe or in different subframes
- number of bits used for PHRs
- which CC the PHRs are sent on

- If RAN2 decides that the Type 2 PHR can be derived for subframes where PUCCH is not actually transmitted, PUCCH Format 1A is used as the reference format.
- When Type 2 PHR is derived for subframes where PUCCH is transmitted, the PUCCH format used for PHR Type 2 is the PUCCH format actually transmitted.
- LS to be sent to RAN2: Draft in R1-103357 (Alex Damjanovic)

Friday 14th

R1-103357	[Draft] LS on power headroom reporting for carrier aggregation	Qualcomm Incorporated	

Decision: The document is noted and final LS is agreed in R1-103405 according the following corrections:

- Pcmax,c
- be consistent with minus or –
- lower case for format 1a
- cc to RAN4

6.2.5.3 Power scaling in case of power limitation

R1-103355	WF for power scaling in case of power limitation	Huawei, Motorola, Qualcomm	

The document was presented by Weimin Xiao from Huawei and proposes as way forward that, in case of UE power limitation, it is left for UE implementation how to scale the power of PUSCH transmission without UCI on each CC. UE follows per CC and per UE max power limitations that will be specified by RAN4
Decision: The document is noted.

R1-102616	Uplink power limitation handling for carrier aggregation	Ericsson, ST-Ericsson	

The document was presented by Dirk Gerstenberger from Ericsson and concludes that the UE should scale PUSCH equally on CCs that do not contain UCI on PUSCH.
Decision: The document is noted.

R1-102650	Considerations on uplink power scaling in LTE-A	CATT	

The document was presented by Zukang Shen from CATT and provides the following proposals for a Rel-10 UE:

- In case power limitation happens, power scaling shall guarantee neither UE total maximum transmit power nor per CC maximum transmit power is exceeded.
- Concurrent transmissions of multiple PUCCH formats are not supported. When maximum power limitation happens, PUCCH power shall always be prioritized regardless the PUCCH format.
- Concurrent transmissions of PUCCH and PUSCH with UCI or concurrent transmission of multiple PUSCH with UCI on multiple CCs is not supported. When maximum power limitation happens, transmit power for PUSCH with UCI shall always be prioritized regardless to the UCI types.
- When power limitation happens, transmit power of PUSCH without UCI on each UL CC shall be scaled down equally.

Decision: The document is noted.

R1-103204	Power scaling to zero in LTE-A UL power control	Sharp	

The document was presented by Prem Sood from Sharp and proposes that a UE may set a wc value exactly to zero depending on UE implementation.
Decision: The document is noted.

R1-102784	Power scaling method for maximum power	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Mrs Jungah Lee from Alcatel-Lucent and deals with power scaling strategy for CA:

- Power scaling formula that is applied at the UE is proposed. The scaling factor that is computed at the UE based on higher-layer signalled parameters depending on PUSCH priorities.
  - UE autonomous power scaling should be limited as much as possible. Further study is needed on UE behaviour.

- When PUCCH is present, scaling of PUSCH with UCI is required due to maximum transmit power constraint.
- PUSCH with UCI corresponding to DL CC can be mapped to one or multiple UL component carriers. The mapping should follow the normal DL/UL carrier linkage.
- When scaling PUSCHs with UCI, equal priority applies to all PUSCHs with UCI.
- If any UCI is multiplexed with PUSCH in a subframe, all UCI in that subframe should be multiplexed with PUSCH.
- Impact of power difference among carriers and among PUCCH and PUSCH within the same band on power scaling requires further study.
- Path loss offset compensation due to limited DL measurement requires further study, depending on RAN4 input.

Decision: The document is noted.

R1-102947	Power reduction rule for uplink carrier aggregation	Nokia Siemens Networks, Nokia	

The document was presented by Jari Lindholm from NSN and recommends that:

- No power reduction is applied on CCs transmitting PUSCH with UCI, i.e. wc = 1 for CCs carrying PUSCH with UCI.
- The UE autonomously determines the scaling factors to be applied to CCs carrying PUSCH w/o UCI, i.e. same relative power reduction (including power truncation) on different CCs carrying PUSCH w/o UCI.

Discussion (Question / Comment): Discussion on the benefit having UCI in more than one PUSCH in the uplink.
Decision: The document is noted.

Agreement:

- UCI cannot be carried on more than one PUSCH in a given subframe.

Note: This agreement doesn't preclude anything on the PUCCH

Should the UE power scaling for the case of multiple PUSCHs without UCI be specified?

- No: Huawei, Motorola, Qualcomm, Sharp
- Yes: Ericsson, ST-Ericsson, LGE, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Nokia, Nokia Siemens Networks, Samsung, CATT

Agreed in principle (subject to contrary input from RAN4):

- The UE shall scale the power of all PUSCHs without UCI equally. Note that possibly setting the power of a PUSCH to zero is up to RAN4.

It is FFS in RAN1 how the UE knows which PUSCH carries the UCI in the case when the UE transmits more than one PUSCH in a given subframe.

LS to be sent to RAN2 and RAN4 covering the above 3 points (Ericsson): R1-103358.

Tuesday evening

R1-103358	DRAFT LS on uplink power control for carrier aggregation	Ericsson	

The document was presented by Dirk Gerstenberger from Ericsson and captures the above agreements.
Discussion (Question / Comment): Motorola commented the note "the possibility of setting the power of a PUSCH to zero in cases where the power level is close to zero is left to RAN4"; was "close to zero" the right understanding? and does RAN1 trust RAN4 to answer that?
Decision: The document is noted. Wording is modified as "power level is close to zero, or significantly less than the power of a PUSCH on another CC" and final LS is agreed in R1-103371.

Not formally reviewed during the session.

R1-102694	Remaining issues about power scaling	LG Electronics	
R1-102749	Power scaling in power limited cases	Qualcomm Incorporated	
R1-103008	Power Scaling for UL TPC with CA	Samsung	
R1-103169	Power Scaling for LTE-A	Motorola	

6.2.5.4 Details of cross carrier PC with DCI Format 3/3A

R1-102651	Considerations on cross-carrier uplink power control with DCI format3/3A in LTE-A	CATT	

The document was presented by Zukang Shen from CATT and proposes:

- The PUCCH TPC commands in multiple DL grants for a UE in a sub-frame shall be the same, and the UE shall use one of the received PUCCH TPC commands.
- Cross carrier TPC with DCI format 3/3A is beneficial for controlling SRS transmit power on multiple UL carriers. In case cross carrier TPC with DCI format 3/3A is supported, higher layers shall configure a tpc-index for each UL carrier.

Decision: The document is noted.

R1-102750	Cross-carrier PC with DCI format 3/3A	Qualcomm Incorporated	

The document was presented by Juan Montojo from Qualcomm and proposes:

- Group TPC commands are conveyed on the DL carrier(s) configured by the higher layers
  - A UE may be configured for multiple TPC-PUSCH-RNTIs and for each group defined by the RNTI, one or more tpc-Index(es), each index corresponding to one configured UL carrier, is provided
- Allow Rel-10 UEs to receive multiple TPC commands in the existing 3 and 3A messages, each command having possibly different length or define a new single DCI format that is a combination of DCI formats 3 and 3A.

Decision: The document is noted.

R1-102818	Cross-carrier power control using DCI Formats 3/3A	Texas Instruments	

The document was presented by Anthony Ekpenyong from TI and states that in order to preserve backward compatibility with Rel-8/9 UEs

- TPC commands for different CCs should be signaled with different TPC indexes in DCI Format 3/3A.

Decision: The document is noted.

R1-102864	DCI format 3/3A for cross carrier operation	Panasonic	Update of R1-102030

The document was presented by Akihiko Nishio from Panasonic and draws the following proposals:

- For PUSCH and PUCCH
  - Support of cross carrier PC with DCI format 3/3A without a CIF
- For PUSCH
  - Multiple CCs of the same UE may be allocated on different tpc-indices of the same PUSCH TPC RNTI
  - A UE may receive multiple PUSCH TPC RNTIs
  - The allocation of PUSCH TPC RNTIs and tpc-indices to UL CCs is configured by higher layers as in Rel-8
- For PUCCH
  - Regardless of the RAN1 decision on the number of PUCCHs which can be transmitted simultaneously, all PUCCHs are power controlled by a single command

Decision: The document is noted.

R1-102948	Cross-CC Scheduling for DCI Format 3/3A in LTE-Advanced	Nokia, Nokia Siemens Networks	(R1-101891)

The document was presented by Lars Lindh from Nokia and proposes that:

- Cross-CC scheduling with DCI format 3/3A is supported in LTE-Advanced.
- To support cross-CC scheduling for DCI format 3/3A without sacrificing backward-compatibility and reliability, a portion of DCI format 3/3A payload is configured to carry an embedded CIF at a fixed position while the whole DCI format 3/3A payload size is still aligned to that of DCI format 0/1A in the common search space.

Decision: The document is noted.

R1-102785	Way Forward on cross-carrier power control	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Mrs Jungah Lee from Alcatel_Lucent and proposes:

- Cross-carrier group PC ~~for PUSCH~~ should be supported
- Semi-static configuration of TPC-PUSCH-RNTI(s) and TPC-index to define the mapping between the TPC command and the UE/CC
- No new DCI formats or sizes need to be designed for carrying group TPC commands for CA

- Multiple Rel-8 DCI Formats 3/3A can be decoded by Rel-10 UE
- Multiple TPC commands in a single DCI Format 3/3A message can be decoded by Rel-10 UE
- No increase in UE blind decoding attempts due to cross-carrier group power control

Discussion (Question / Comment): .
Decision: The document is noted.

- Proposal 1 in relation to cross-carrier group PC:
  - Semi-static configuration of multiple TPC-PUSCH-RNTI/TPC-index pairs (FFS whether multiple RNTIs are supported) to define the mapping between the TPC command and the UE/CC
    - No increase in UE blind decoding attempts due to cross-carrier group power control
- Proposal 2 in relation to cross-carrier group PC:
  - Cross-carrier group PC is not supported in Rel-10.

Support proposal 1:
- Panasonic, Samsung, RIM, Qualcomm, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, ZTE, CATT, TI, Philips, Intel, HTC, Mediatek,

Support proposal 2:
- Ericsson, ST-Ericsson, Nokia, NSN, Motorola, Huawei

No consensus could be reached by the end of Monday session. Mr Chairman decided to let the discussion continue off line and revisit the topic later on.
Friday 14th : Ericsson reported that, from off line discussion, there were no clear motivations to explain the gain/benefit of cross carrier group PC but rather a "why not" position from supporting companies. The topic shall be revisited at next meeting.

R1-102733	Cross Carrier Power Control with DCI format 3/3A	HTC	
R1-102848	Views on DCI format 3/3A Design in Carrier Aggregation	MediaTek	
R1-102909	Issues on UL TPC Command in LTE-Advanced	ZTE	
R1-102991	Discussion about TPC transmission for CA in LTE-A	Potevio	
R1-103009	Cross-carrier UL PC for LTE-A	Samsung	
R1-103093	Consideration of DCI 3/3A for Carrier Aggregation	Huawei	
R1-103190	Consideration on DCI Format 3 / 3A for Cross-Carrier Scheduling	ASUSTeK	

6.2.5.5 Other

Not treated.

R1-102695	PUCCH TPC in multiple DL grants	LG Electronics	
R1-102751	Power control for multi-antenna transmission	Qualcomm Incorporated	
R1-103010	UL SU-MIMO power control	Samsung	
R1-103094	Uplink multi-antenna power control	Huawei	
R1-103177	UL Power Control for Multi-Antenna UE	Motorola	
R1-103205	Issues with per-antenna uplink power control	Sharp	R1-102396
R1-103250	Uplink Power Control for Multi-antenna Transmission	NTT DOCOMO	

6.2.6 PUSCH Resource allocation

R1-103200	Summary of email discussion on PUSCH resource allocation	Panasonic	

The document was presented by Seigo Nakao from Panasonic and provides the outcomes of email thread under [60bis-04-LTE-A]. Focus was put on:

- Support dynamic switching between Rel.8 single cluster transmission and Rel.10 multi-cluster PUSCH transmission?
- DL/UL transmission mode can be configured independently?
- Size of each cluster is one of the following?
- No additional blind decoding at least for single antenna transmission?
- Whether to support non-contiguous RA for UL SU-MIMO?
- What is the maximum number of clusters? and why?
- DCI format size for single antenna transmission?
- DCI format size for SU-MIMO?

Discussion (Question / Comment): Ericsson commented about the limitation of the method having such discussion over email reflector – it looks more like a survey of ideas (restating companies positions) rather than solving the real issues.
Decision: The document is noted.

From email discussion, the following is agreed:

- Support dynamic switching between Rel.8 single cluster transmission and Rel.10 multi-cluster PUSCH transmission
- DL/UL transmission mode can be configured independently
    - Note that independent configuration of DL and UL transmission modes doesn't necessarily imply all DL and UL modes are to be supported in arbitrary combination, and this would be left FFS.

Impact of power backoff

R1-102949	Performance evaluation and RA design for clustered allocation	Nokia Siemens Networks, Nokia	

The document was presented by Xiaoyi Wang from NSN and lists the following proposals:

- Dynamic switching or fallback from clustered RA to localized RA is supported.
- Limited number (N) of clusters is selected as way forward
- Maximum cluster number is 2 as way forward
- Two PRBs is considered as the minimum cluster size for clustered allocation
- Clustered allocation should not require dedicated DCI format.
- Clusters need to be aligned with SRS bandwidth tree
- Cluster RA should be supported in SU-MIMO transmission

Decision: The document is noted.

R1-103095	Noncontiguous PUSCH resource allocation	Huawei	

The document was presented by Ms Elean Fan from Huawei and shows simulation results assuming power back-off of 4dB, 6dB or 10dB, same to all the UE, to see whether it has a big impact to the average cell throughput and average cell edge throughput. The conclusions are as following:

- Whether limiting cluster number or not has very small impact on the system performance.
- Given the small potential gains from non-contiguous RA and that non-contiguous RA is not needed to meet any requirements for LTE-A, the amount of effort for standardizing the feature should be minimized.
- More restricted and complicated scheduling is not desirable.

Discussion (Question / Comment): Similar results obtained by Motorola [R1-103170].
Decision: The document is noted.

R1-103170	Impact of UE power control errors on non-contigous PUSCH performance	Motorola	

The document was presented by Ravikiran Nory from Motorola and proposes, when a UE is configured to transmit on one UL CC, that only contiguous resource allocations within that CC are supported for LTE Rel-10.
Decision: The document is noted.

R1-103206	Performance of non-contiguous resource allocation with power back-off and TPC error	Sharp	

The document was presented by Kazunari Yokomakura from Sharp and shows simulation results that non-contiguous RA can achieve average cell throughput of 8 – 10 %. Consequently it is proposed that non-contiguous resource allocation should be supported for Rel-10.
Decision: The document is noted.

Agreements:

- Size of each cluster has a value from the following set:
  - N x 1RB, N x 2RBs, N x 3RBs, N x 4RBs, N x 5RBs
    - N is integer number
    - The above values may be further reduced – FFS
- No additional blind decodings to support non-contiguous UL RA in single antenna transmission case
  - i.e. the size of the DCI format used to support non-contiguous UL RA is matched to the size of Format 0 or the semi-statically configured DCI Format size for the same UE
  - Format size matching is done by padding one of the messages if necessary
- "No additional blind decodings to support non-contiguous UL RA" also applies to SU-MIMO case if SU-MIMO is supported with non-contiguous UL RA

Not treated.

R1-102696	Evaluation of clustered DFT-S-OFDMA transmission with power backoff	LG Electronics	
R1-102867	Discussion on inter-modulation issue for clustered PUSCH transmission	Panasonic	Update of R1-102033
R1-103054	Consideration on the required maximum power back-off for clustered DFT-S-OFDM with adaptive SRS transmission	NEC Group	
R1-102950	Output power back-off aspects for clustered PUSCH	Nokia Siemens Networks, Nokia	

RA Schemes and DCI Signalling

R1-103251	Signaling to Support Non-contiguous RB Allocation	NTT DOCOMO	

The document was presented by Kazuaki Takeda from NTT DoCoMo and deals with signaling methods signaling to support uplink non-contiguous RB allocation. Preferred methode is:

- Bit alignment to downlink non-contiguous allocation such as DCI formats 1, 2.

Decision: The document is noted.

R1-103182	DCI format for Non-contiguous PUSCH resource block allocation	Motorola	

The document was presented by Robert Love from Motorola and proposes for non-contiguous UL allocations:

- Use of Type 0 and Type 1 RB Allocation for non-contiguous UL FS scheduling.
- Frequency hopping is not needed for non-contiguous UL RB allocations (can reuse bit)
- DCI formats 0_1 (SIMO) and 0_2 (MIMO) to support non-contiguous (and contiguous) RB allocations for PUSCH transmissions using the release-8 Type-0 and Type-1 RB allocation scheme. To save 1-bit the Type-1 shift bit can be taken from the resource allocation Type-0 field.
- Support an additional 16 blind decodings for new uplink transmission modes including DCI format 0_1 and DCI format 0_2 for rank-2 UL MIMO transmissions
  - Since DCI format 0_1 has both non-contiguous and contiguous RB allocation then it is possible to dynamically switch between them. (Same is true for DCI format 0_2).

Decision: The document is noted.

R1-102849	Discussion on resource allocation of multi-cluster PUSCH	MediaTek	

The document was presented by ChienHwa Hwang from MediaTek and proposes:

- The number of clusters supported by non-contiguous PUSCH resource allocation is at most 2.
- The minimum size of a cluster shall be restricted; each cluster contains equal number of RBs; the total number of RBs in all clusters shall fulfill $M_{\mathrm{RB}}^{\mathrm{PUSCH}} = 2^{\alpha_2} \cdot 3^{\alpha_3} \cdot 5^{\alpha_5} \leq N_{\mathrm{RB}}^{\mathrm{UL}}$.

Decision: The document is noted.

R1-102752	UL resource allocation for PUSCH	Qualcomm Incorporated	

The document was presented by Wanshi Chen from Qualcomm and provides DCI format structure (table 3) according to the following design considerations:

- UL resource allocation design has to consider both multi-cluster assignments and SU-MIMO operation jointly
- In addition to multi-cluster resource allocation, eNB should be able to assign, in a given subframe, UL resources to LTE-A UEs using the same Rel-8 signaling approach
- 3 or more clusters should be supported
- The support of multi-cluster UL resource allocation signaling should not increase the number of PDCCH blind decodes

Decision: The document is noted.

R1-102866	Signaling for UL non-contiguous resource allocation	Panasonic	Resubmission of R1-102032

The document was presented by … from Panasonic and details a signaling scheme for UL non-contiguous resource allocation (RA) based on the following design considerations:

- Bit-map based allocation for supporting more than 2 clusters.
- Per RBG granularity to reduce the number of signaling bits.
- No additional blind decoding at least for single antenna transmission.

Decision: The document is noted.

R1-103012	DCI Format for Multi-Cluster PUSCH Transmissions	Samsung	

The document was presented by Aris Papasakellariou from Samsung and proposes the reuse of DCI format 0 for non-contiguous RA by:

- Using the existing padded bit to differentiate between contiguous and non-contiguous RAs.
- Addressing RBGs instead of individual PRBs.
- Using the 1 bit from the FH IE to supplement the RA IE.

Decision: The document is noted.

R1-103238	Multi-cluster PUSCH resource allocation	Mitsubishi Electric	

The document was presented by … from Mitsubishi and proposes:

- Handle single-stream multi-cluster UL transmission with a DCI format having same size as DCI Format 0/1A
- FFS how to handle multi-stream UL transmission with DCI formats having same size as transmission mode related DL DCI Formats or with a new DCI format with a different size
- Low RA size desirable for both single-stream and multi-stream multi-cluster allocations
  - Limit the number of clusters to 2 or 3 clusters in multi-cluster allocation
    - Keep the same RBG size as in Rel-8/9
    - Full flexibility with 2 clusters
    - Equal cluster size with 2 or 3 clusters
- Switch from RBG-based multi-cluster allocation to RB-based single-cluster allocation using 1 bit
  - Padding bit when available in Rel-8/9; additional flag otherwise

Decision: The document is noted.

Agreement:

- Re-use resource indexing scheme from Rel-8
  - RA schemes type 0/1/2 or CQI RB indexing scheme with minimal modifications
- Continue offline discussion during this week to aim for a more detailed way forward for UL non-contiguous RA.

Number of clusters:

- Chairman's suggestion on the number of clusters is
  - Compromise on max 3 clusters. Continue offline discussion during this week.
  - Samsung strongly objected as they believe 3 clusters may be a major design issue to RAN1. Nokia agreed with Samsung's view. Ericsson proposed to let RAN4 decide.

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R1-103411	Way forward on non contiguous PUSCH Resource allocation	Samsung, Nokia, NSN, NEC, Sharp, ZTE, Ericsson, ST-Ericsson, Mitsubishi, ETRI, Texas Instruments, HTC, LG Electronics, Pantech, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, RIM, Interdigital, ASUSTeK, Potevio	

The document was presented by Aris Papasakellariou from Samsung.
Discussion (Question / Comment): .
Decision: The document is noted and is modified and agreed in R1-103425. Following the agreement, Qualcomm raised a concern that second bullet is repeating what was already agreed. Ericsson and Samsung questioned what was the motivation attempting to modify the already agreed WF. In order to cut short the debate, Mr Chairman decided that the concerns on this agreed WF should be raised on the RAN1 email reflector, if any.

Reply LS to RAN4

R1-103372	Draft response to LS from RAN4 on simultaneous PUSCH and PUCCH and clustered SC-FDMA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	(R1-102777)

The document was presented by Fang-Chen Cheng from Alcatel-Lucent and is a draft LS based on received comments from companies.
Discussion (Question / Comment): Ericsson commented that the statement "…most impairements" has an ambiguous meaning.
Decision: The document is noted. Wording shall be tuned off line for finalization by Friday and update provided in R1-103373.
Friday 14th

R1-103373	Draft response to LS from RAN4 on simultaneous PUSCH and PUCCH and clustered SC-FDMA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	(R1-103372)

Decision: The document is noted and final LS is agreed in R1-103422.

Not treated.

R1-103158	Resource allocation schemes for non-contiguous PUSCH	Motorola	
R1-102865	Additional system performance evaluation for UL non-contiguous resource allocation	Panasonic	Resubmission of R1-102532
R1-102786	Non-contiguous PUSCH resource allocation signalling	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-102697	DCI format to support UL non-contiguous resource allocation	LG Electronics	
R1-103286	DCI format design for UL non-contiguous resource allocation with single antenna transmission	NEC Group	(R1-103053)
R1-103191	Non-contiguous uplink resource allocation for LTE-A	ASUSTeK	
R1-102835	Further details on the non-contiguous UL RA scheme with limited clusters	Pantech	
R1-102850	Signalling of multi-cluster PUSCH resource allocation	MediaTek	
R1-103239	Details on multi-cluster PUSCH resource allocation	Mitsubishi Electric	
R1-103011	Multi-Cluster PUSCH Transmissions – Performance Overview	Samsung	

6.2.7 Other

Not treated.

R1-102652	Evaluation of UL CM in LTE-A	CATT	
R1-102868	Aperiodic CQI Reporting for Carrier Aggregation	Panasonic	Update of R1-102034
R1-102951	Autonomous Base Component Carrier selection results in dense urban area scenario	Nokia Siemens Networks, Nokia	(R1-101893)
R1-102952	CSI reporting for Carrier Aggregation	Nokia Siemens Networks, Nokia	(R1-101894)
R1-103013	CQI discrepancy between PDCCH and PDSCH region	Samsung	
R1-103014	Aperiodic CQI activation in CA	Samsung	
R1-103196	Control Channel Power Control in CSG Cell	ETRI	
R1-103242	Consideration on Inter-CC Subframe Synchronization	Mitsubishi Electric	

6.3 Enhanced Downlink Multiple Antenna Transmission

R1-103403	DL RS Chairman's notes	Ad Hoc chairman (NTT DoCoMo)	

The document was presented by Tetsushi Abe from NTT DoCoMo.
Decision: The document is endorsed and reported as follows in sections 6.3.1 and 6.3.2.

6.3.1 DM RS

6.3.1.1 Layer mapping

Details for retransmissions

R1-102626	Layer mapping for re-transmission	Ericsson, ST-Ericsson	
R1-102653	Discussion on layer-to-DMRS port mapping	CATT	
R1-102718	DM-RS Port Mapping for Retransmission	LG Electronics	
R1-102753	DM RS layer mapping for re-transmissions	Qualcomm Incorporated	
R1-102895	Views on layer to DMRS port mapping for retransmission	ZTE	
R1-102953	DM-RS details for retransmission	Nokia, Nokia Siemens Networks	
R1-103096	Downlink DMRS design for retransmission.	Huawei	
R1-103183	DM-RS Layer Mapping and Control Signalling	Motorola	

Decision: The above set of documents are noted.

Conclusion:

- For retransmission with rank = R, the same layer to DMRS port mapping rule and the same PDSCH to RE mapping rule are applied as an initial transmission with rank R.

6.3.1.2 PRB bundling

R1-103015	Email discussion summary of PRB bundling	Samsung	

The document was presented by Lingjia Liu from Samsung.
Decision: The document is noted.

R1-103385	WF about PRB Bundling	CMCC, CATR, Fujitsu, Motorola, Huawei, Potevio, Qualcomm, TD-Tech	

Decision: The document is noted.

R1-103374	WF on PRB bundling in Rel-10	AT&T, CATT, CHTTL, Ericsson, ETRI, HTC, HT mMobile, Institute for Information Industry, Intel, LG Electronics, Marvell, MediaTek, NEC, Pantech, Samsung, ST-Ericsson, Texas Instruments, Toshiba, Vodafone, ZTE	

Decision: The document is noted.

Conclusion:

- R1-103374 is agreed as baseline with the following revisions:
  - UE may assume, as an implementation option, that precoding granularity is multiple RBs
- Discuss offline further based on R1-103374 by Friday considering the following aspects.
  - PRG size for 27 – 63 RB, and 1 – 10 RB system bandwidth
  - Conditions or mechanism when UE may not assume multiple RB precoding granularity is further study.

R1-103097	DMRS PRB Bundling discussion	Huawei	

Decision: The document is noted.

R1-103166	Results on PRB bundling for MU-MIMO	Motorola	

Decision: The document is noted.

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R1-103420	Way Forward for Remaining Issues on PRB bundling in Rel-10	Alcatel Lucent, Alcatel Lucent Shanghai Bell, ASUSTek, AT&T, CATT, CeWit, CHTTL, CMCC, Ericsson, ETRI, Fujitsu, HTC, HT `mMobile, III, Intel, LG Electronics, Marvell, MediaTek, NEC, Nokia, Nokia Siemens Networks, NTT DoCoMo, Pantech, Philips, Research In Motion, Samsung, ST-Ericsson, Texas Instruments, Toshiba, Vodafone, ZTE	

Decision: The document is noted and the WF is agreed.

Not treated.

R1-102787	Coherent Time-Frequency Precoding for the PRB bundling	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-102788	Discussion on Wide Band PRB bundling	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-102719	PRB Bundling in LTE-Advanced	LG Electronics	
R1-102754	On PRB bundling support	Qualcomm Incorporated	
R1-102896	Views on PRB bundling	ZTE	
R1-103016	PRB bundling for Rel-10	Samsung	

R1-103228	Discussion on the impact of PRB bundling on MU-MIMO	CMCC	

6.3.1.3 OCC mapping

R1-103252	Length-4 OCC Mapping Scheme for DM-RS Rank 5-8 in LTE-Advanced	NTT DOCOMO	

Decision: The document is noted.

R1-103017	Discussion on DMRS Power Balancing across OFDM symbols	Samsung	

Decision: The document is noted.

R1-102720	OCC Mapping for DM RS in LTE-A	LG Electronics	(R1-102377)

Decision: The document is noted.

R1-102755	OCC mapping for DL MIMO transmissions	Qualcomm Incorporated	

Decision: The document is noted.

R1-102869	OCC mapping for DM-RS rank 5~8	Panasonic	

Decision: The document is noted.

R1-102897	OCC allocation and OCC mapping	ZTE	

Decision: The document is noted.

R1-103098	OCC mapping scheme for downlink DMRS	Huawei	

Decision: The document is noted.

R1-103220	DM-RS OCC design for Rank 5-8 in LTE-Advanced	Fujitsu	

Decision: The document is noted.

R1-103369	WF on power balancing of Rel-10 DM RS	AT&T, Broadcom, CeWit, CHTTL, ETRI, HTC, HT `mMobile, I2R, Intel, ITRI, LGE, MediaTek, mimoOn, Motorola, Pantech, Research In Motion, Samsung, Texas Instruments	

Decision: The document is noted.

R1-103386	Way forward on OCC mapping for DM-RS rank 5-8	Fujitsu, CATT, Huawei, NTT DoCoMo, Potevio, Toshiba	

Decision: The document is noted.

6.3.1.4 DM RS pattern for extended CP

Not treated.

R1-102627	Discussion on DM RS pattern for extended CP	Ericsson, ST-Ericsson	
R1-102654	Further investigation on DMRS design for extended CP	CATT	
R1-102756	UE-RS patterns for rank 1-4 and extended CP	Qualcomm Incorporated	
R1-102898	DMRS pattern design under extended CP	ZTE	
R1-103099	DMRS pattern design for extended CP	Huawei	
R1-103184	Extended CP DM-RS Pattern	Motorola	

R1-103368	DM-RS views on extended CP	Nokia, Nokia Siemens Networks	(R1-102954)
R1-103380	DM RS for extended CP	Samsung	(R1-103018)
R1-103383	Way forward on DM-RS pattern for extended CP	CMCC, CATT, Ericsson, LG Electronics, NEC, Nokia, Nokia Siemens Networks, ST-Ericsson, ZTE	

6.3.2 CSI RS

R1-103100	Email discussion summary of CSI-RS design	Huawei	

The document was presented by Ms Xia Yuan from Huawei.
Decision: The document is noted.

6.3.2.1 Intra-cell CSI-RS

Intra-cell CSI RS design

R1-102628	Considerations on CSI-RS design	Ericsson, ST-Ericsson	
R1-102655	Further investigation on intra-cell CSIRS	CATT	
R1-102721	Remaining Issues on Intra-cell CSI-RS Design	LG Electronics	
R1-103288	Further details on CSI-RS	Qualcomm Incorporated	(R1-102757)
R1-102789	CSI-RS design	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-102870	Views on Intra-cell CSI-RS design	Panasonic	
R1-102873	Inter-cell CSI-RS design	Panasonic	
R1-103375	CSI-RS pattern and configuration	ZTE	(R1-102899)
R1-102956	Intra-cell CSI-RS design	Nokia, Nokia Siemens Networks	
R1-103020	Discussion on intra-cell CSI-RS design	Samsung	
R1-103101	CSI RS pattern design	Huawei	
R1-103143	Consideration on intra cell CSI-RS pattern	CATR	
R1-103179	CSI-RS Pattern Design based on CSM	Motorola	
R1-103230	Further considerations on intra-cell CSI-RS design	CMCC	
R1-103253	Intra-cell CSI-RS design	NTT DOCOMO	

Decision: The above set of document is noted.

R1-103381	WF for CSI-RS	LG Electronics, NTT-DoCoMo, Nokia, Nokia Siemens Networks, Sharp, NEC, ETRI, Pantech, Research In Motion, HTC, Texas Instruments, Fujitsu, Samsung	

Decision: The document is noted.

R1-103384	WF on CSI RS pattern	Huawei, CATR, CATT, Ericsson, HT mMobile, ITRI, Mediatek, ST Ericsson, Potevio	

Decision: The document is noted.

R1-103388	WF on CSI RS and antenna port 5 coexistence	CMCC, CATT, CATR, Huawei, Motorola, Potevio, Qualcomm	

Decision: The document is noted.

Conclusion:

- CSI RS port multiplexing is based on CDM for each pair of CSI RS port
  - ~~Reconsider FDM/TDM if RAN4 concludes 9 dB boosting is feasible~~
  - Avoidance of port 5 of the same cell should be addressed.
- A nested structure among 2, 4, 8 CSI-RS ports simplifies the implementation
  - The pattern with smaller number of CSI-RS port is a subset of the pattern with larger number of CSI-RS port
- Study a single and multiple patterns in terms of achievable reuse factor and signaling overhead.
- A time-invariant time/frequency shift is used in a cell
- Each company is encouraged to bring pattern proposals for normal and extended CP, and for FDD and TDD
  - Email discussion until RAN1#61b on the pattern proposals: Moderator: Xia Yuan @ Huawei
    - Patterns to be provided by Wednesday 2nd June.
    - Discussion of patterns can continue afterwards.

Interference measurement

R1-102955	Achievable CQI measurement accuracy over CSI-RS	Nokia, Nokia Siemens Networks	

Not treated.

6.3.2.2 Muting

Not treated.

R1-102698	Muting aspects and Intercell CSI-RS design	LG Electronics	
R1-102819	PDSCH muting for inter-cell CSI estimation: Rel-8 UE performance	Texas Instruments	
R1-102820	PDSCH muting: N-MSE for inter-cell CSI estimation	Texas Instruments	
R1-102871	Link level analysis on RE muting for CSI-RS design: Step1 evaluation	Panasonic	Resubmission of R1-102459
R1-102900	CSI-RS muting evaluation	ZTE	
R1-102957	Stage 1 simulation study of RE muting for inter-cell CSI-RS	Nokia, Nokia Siemens Networks	
R1-103163	Views on muting and reuse factors for CSI-RS	Motorola	
R1-103254	Performance Evaluation of RE Muting for Inter-cell CSI-RS	NTT DOCOMO	
R1-103364	Evaluation on muting benefit for CSI RS design	Huawei	(R1-103102)
R1-103382	Link level analysis on RE muting for CSI-RS design: Step2 evaluation	Panasonic	(R1-102872)

Email discussion until RAN1#61bis – Rapporteur Tetsushi Abe.

6.3.3 DL Single-Cell MU-MIMO

6.3.3.1 Transparent vs. non-transparent MU-MIMO

Not treated.

R1-102657	Control signaling for DL MIMO	CATT	
R1-102722	Discussion on MU-MIMO Transparency in LTE-A	LG Electronics	
R1-102758	Transparent vs. non-transparent MU-MIMO operation	Qualcomm Incorporated	
R1-102790	DCI formats for MU-MIMO	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-102821	Views on MU-MIMO transparency	Texas Instruments	
R1-102836	DMRS Indicator of DL signalling for Non-transparent MU-MIMO	Pantech	
R1-102901	Consideration on downlink control signalling design for MU-MIMO transparency	ZTE	
R1-103021	Discussions on DL control signalling for LTE-A MU-MIMO	Samsung	
R1-103022	Performance evaluation of transparent vs. non-transparent MU-MIMO	Samsung	
R1-103023	Discussion on PDCCH capacity considering MU-MIMO	Samsung	
R1-103055	Views on MU-MIMO transparency	NEC Group	
R1-103103	DCI discussion on transparent MU-MIMO	Huawei	
R1-103165	Transparent MU-MIMO operation for Rel-10	Motorola	
R1-103255	Transparent/Non-transparent MU-MIMO in LTE-Advanced	NTT DOCOMO	
R1-103271	Discussion on transparency of LTE-A MU-MIMO	InterDigital Communications, LLC	

6.3.3.2 Use of DM RS ports / scrambling sequences for MU-MIMO

Not treated.

R1-102629	On DL Single-Cell MU-MIMO	Ericsson, ST-Ericsson	
R1-102723	Discussion on DM-RS Resource Allocation for MU-MIMO in LTE-A	LG Electronics	
R1-102759	Spatial multiplexing of UEs in Rel-10	Qualcomm Incorporated	
R1-102822	On DL MU-MIMO dimensioning	Texas Instruments	
R1-102874	DMRS port indication with MU-MIMO considerations	Panasonic	Resubmission of R1-102036
R1-102902	Performance study of MU-MIMO with quasi-orthogonal DMRS and orthogonal DMRS	ZTE	
R1-102903	Consideration on downlink control signalling design for DMRS port indication with different MU dimensions	ZTE	
R1-102958	On the downlink DM-RS support for MU-MIMO in LTE Rel-10	Nokia, Nokia Siemens Networks	
R1-102988	Downlink signalling support for MU-MIMO in LTE-A	Potevio	
R1-103056	On the use of DM RS ports / scrambling sequences for MU-MIMO	NEC Group	
R1-103104	DMRS for MU MIMO	Huawei	

R1-103164	Results on DM RS port allocation for MU-MIMO	Motorola	
R1-103185	DM-RS Ports / Scrambling Sequence Design for DLSingle Cell MU-MIMO	Motorola	
R1-103229	DMRS indication in DL enhanced Multiple antenna transmission	CMCC	
R1-103256	DMRS Configuration for DL MU-MIMO in LTE-Advanced	NTT DOCOMO	
R1-103344	Link level evaluation of DM RS ports for MUMIMO	Huawei	

R1-103406	Way forward for Rel-10 MU-MIMO	Huawei, HTC, Motorola, Philips, Pantech, Potevio, Research In Motion, TD-Tech, ZTE	(R1-103343)

Decision: The document is noted and is for email approval until RAN1#61b meeting.

R1-103334	WF on DL MU-MIMO	Broadcom, CATT, CATR, CEWiT, CHTTL, CMCC, Ericsson, ST-Ericsson, Fujitsu, HTC, HT mMobile, ITRI, LG Electronics, MediaTek, NewPostCom, Nokia, Nokia Siemens Networks, NTT DOCOMO, Panasonic, Samsung, Texas Instruments	

Decision: The document is noted and is for email approval until RAN1#61b meeting.

6.3.3.3 Other

R1-103257	Consideration on DCI Design for DL MIMO in Rel-10	NTT DOCOMO	

Not treated.

6.3.4 Feedback design & Codebook

R1-103376	Antenna configurations for practical deployments	AT&T, CMCC, Deutsche Telekom, NTT DOCOMO, Orange, Vodafone	(R1-103279)

The document was presented by Eric Hardouin from Orange and deals with the eNodeB antenna configurations foreseen to be deployed in the Rel-10 timeframe and beyond. The main conclusions are as follows:

- 2 and 4 Tx antennas are expected to remain the dominant number of antennas in LTE-Advanced deployments. Enhancing the feedback for 4 Tx antennas should be given equal priority as designing the feedback for 8 Tx antennas.
- There will be different configurations deployed on the field, so the 4 Tx and 8 Tx codebook designs, while optimised for some particular antenna configurations, should allow the system to achieve good performance over a wide range of configurations. In particular, both correlated channels and uncorrelated channels should be considered in the Rel-10 codebooks design.

Discussion (Question / Comment): Samsung commented that, in longer future, technics for reducing antenna spacing may appear.
Decision: The document is noted.

R1-103338	Simulation assumptions Rel-10 feedback for 4Tx	Huawei, Samsung, Ericsson, Ericsson ST, Marvell, Toshiba, Fujitsu, Intel, ALU, ALU Shanghai Bell, HTC, ZTE	

The document was presented by Yang Tang from Huawei and highlights simulation conditions with the following objectives in mind:

- Evaluate the gain of enhanced double-codebook feedback over Rel.8 feedback for MU-MIMO

- Evaluate the impact of double-codebook feedback when using PUCCH and PUSCH

Discussion (Question / Comment): Philips → assumptions on overhead for CRS should also be considered with the purpose of comparison to Rel-8.
Other antenna labeling assumption is not precluded (TI).
Decision: The document is noted. Revision shall be prepared in R1-103340.

R1-103340	Simulation assumptions Rel-10 feedback for 4Tx	Huawei, Orange, Samsung, Ericsson, Ericsson ST, Marvell, Toshiba, Fujitsu, Intel, ALU, ALU Shanghai Bell, HTC, ZTE, Philips, Motorola	(R1-103338)

Discussion (Question / Comment): Mr Chairman rephrased "if CRS is used, CSI estimation error with CRS may be considered" on slide 9. AT&T requested that configuration "X__X" being simulated and will try to generate some simulation results on their own for the next meeting.
Decision: The document is noted and finally agreed as R1-103346.

R1-103333	Refinements of Feedback and Codebook Design	Ericsson, ST-Ericsson	(R1-102630)

The document was presented by George Jöngren from Ericsson and proposes the following:

- A precoder for a subband is obtained as a matrix multiplication of two precoder matrices
- The inner precoder $\mathbf{W}^{(1)}$ (i.e., closest to the channel) should typically be a tall matrix so that dimension reduction is offered.
- Codebooks for inner and outer precoder designed so that overall precoder fully utilizes all PAs, i.e., for the overall precoder it holds that $\left[\mathbf{W}\mathbf{W}^*\right]_{mm} = \kappa, \quad m = 1, \cdots, N_T$
- Introducing additional precoders not fulfilling full PA utilization FFS
- Perform subsampling of the codebook(s) for maintaining the coverage of CSI on PUCCH which anyway can only support coarse reports
- Possible to report $\mathbf{W}^{(1)}$ and $\mathbf{W}^{(2)}$ in the same subframe using subsampling of codebooks to maintain control signaling coverage
- For 8 Tx rank 1 and 2, introduce support for grid of beam design as in [R1-100794] and [R1-100798]
  - Inline with way forward on feedback refinement and supports 16 beams for ULA and 16 beams for cross-pole
  - $\mathbf{W}^{(1)}$ block-diagonal with 4-element beamformer $\tilde{\mathbf{w}}$ taken from 16 DFT based precoders
  - $\mathbf{W}^{(2)}$ chosen from 2 Tx codebook as baseline

$$\mathbf{W}^{(1)} = \begin{bmatrix} \tilde{\mathbf{w}} & \mathbf{0} \\ \mathbf{0} & \tilde{\mathbf{w}} \end{bmatrix}, \quad \mathbf{W}^{(2)} \in \left\{ \begin{bmatrix} 1 \\ 1 \end{bmatrix}, \begin{bmatrix} 1 \\ -1 \end{bmatrix}, \begin{bmatrix} 1 \\ j \end{bmatrix}, \begin{bmatrix} 1 \\ -j \end{bmatrix}, \begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix}, \begin{bmatrix} 1 & 1 \\ j & -j \end{bmatrix} \right\}$$

  - 4 bits for wideband $\mathbf{W}^{(1)}$ and 2 and 1 bits per subband for $\mathbf{W}^{(2)}$ for rank 1 and 2, respectively

Discussion (Question / Comment): Samsung does not agree with that proposal .
Decision: The document is noted.

R1-103377	Views on the feedback framework for Rel. 10	Samsung	(R1-103026)

The document was presented by Bruno Clerckx from Samsung and proposes the recommended precoder **W** for a subband to be build as $\mathbf{W}=\mathbf{W}_2\mathbf{W}_1$ where

- The recommended precoder **W** is a N_t x R unitary precoding matrix
- The outer matrix $\mathbf{W}_1 \in C_1$ is a tall N_t x R unitary precoding matrix
  - For 4Tx, C_1 is Rel. 8 4Tx codebook
  - For 8Tx, C_1 is designed following the same principles as Rel. 8 4Tx codebook, i.e. nested property, 8PSK alphabet, constant modulus. A reasonable number of vectors in the rank 1 should be DFT vectors.
    - E.g.
      - Samsung codebook in [R1-102199]
      - choose the codewords for each rank based on column subset of the following matrix (with DFT_1 and DFT_2 2 4x4 DFT matrices)

$$V_1 = \mathbf{U}_{rot,8Tx}\begin{bmatrix} DFT_1 & 0_{4x4} & DFT_2 & 0_{4x4} \\ 0_{4x4} & DFT_1 & 0_{4x4} & DFT_2 \end{bmatrix}$$

- The inner matrix $\mathbf{W}_2 \in C_2$ is a square N_t x N_t diagonal matrix
  - For 4Tx, $\mathbf{W}_2 \in C_2$ has the following structure

$$\Theta = \begin{bmatrix} 1 & & & \\ & e^{j\pi\theta} & & \\ & & e^{j2\pi\theta} & \\ & & & e^{j3\pi\theta} \end{bmatrix}$$

  - For 8Tx, $\mathbf{W}_2 \in C_2$ has the following structure

$$\Psi = \begin{bmatrix} \sqrt{2-|\alpha|^2}\Theta & 0_{4x4} \\ 0_{4x4} & \alpha\Theta \end{bmatrix}$$ with α a complex scalar.

Discussion (Question / Comment): Samsung commented that a joint proposal from companies having the same view is in R1-103325. Ericsson commented that impacts on complexity and performance stand point has not been evaluated.
Decision: The document is noted.

R1-103378	Performancce evaluations of Rel. 10 feedback framework	Samsung	(R1-103027)

The document was presented by Bruno Clerckx from Samsung and deals with the performance evaluation of the proposed feedback framework.
Decision: The document is noted.

R1-102791	Further development of two-stage feedback framework for Rel-10	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Federico Boccardi from Alcatel-Lucent and proposes:

- Wideband/long-term feedback should be updated only when the UE detects a variation of the wideband/long-term characteristics of the channel.

The paper also identifies two main categories of approach to W_1 and W_2 in the proposals from different companies. In Approach 1, W_1 is a tall matrix, whereas in Approach 2 W_1 is a square matrix.

- Approach 1 and Approach 2 should be compared by simulations before taking any further decision, under different propagation scenarios. Moreover, the codebooks for $\mathbf{W}_1^{(k)}(t_1)$ and $\mathbf{W}_2^{(k)}(t_2)$ should be tailored to either approach 1 or approach 2.
- Spatial and time/frequency correlation should exploited at the same time.

Decision: The document is noted.

R1-103280	Preliminary evaluation of two-stage feedback framework with “tall” W1	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	

The document was presented by Hongwei Young from Alcatel-Lucent Shanghai Bell and provides simulation results that show for 4Tx cross-polarized antenna, approach 2 based on square wideband/long-term feedback is more robust to spatial correlated channels, and brings more gain than approach 1 based on tall wideband/long-term feedback.
Comparisons of both feedback approaches in 4 Tx co-polarized antenna and 8Tx cross-polarized antenna and/or with more realistic channel impairment modelling needs further investigation.
Decision: The document is noted.

R1-102724	Consideration on Feedback Design for LTE-A	LG Electronics	

The document was presented by Moon-il Lee from LGE and proposes:

- Adopt matrix product form as a codebook structure.
- Adopt a block diagonal matrix for a matrix W1.
- For reporting on PUCCH, time domain multi-granular feedback needs careful study to see whether the feedback overhead can be further reduced without error propagation.
- Enhanced feedback support for MU-MIMO in LTE-A seems to be necessary to fulfill LTE-A requirement.

Decision: The document is noted.

R1-102813	Enhanced MIMO feedbacks for LTE-A	Intel Corporation (UK) Ltd	

The document was presented by Kamran Etemad from Intel and concludes that differential codebook can be used to design C2 in order to improve the subband spatial feedback accuracy. The designing of C2 doesn’t have to be limited by constant modulus and finite alphabet.

Discussion (Question / Comment): TI commented that constant modulus was not necessary.
Number of users per sector was a concern from other companies.
Decision: The document is noted.

R1-103335	Rel-10 codebook design issues for downlink transmission	Pantech	(R1-102838)

The document was presented by … from Pantech In RAN1 #60 meeting and investigates two concepts of dual matrices precoder, targetting long-term/wideband channel properties. It is observed the following:

- In case of intra-domain precoder which performs intra-domain precoding and inter-domain interference mitigation, the intra-domain precoder would target long-term/wideband channel properties.
- In case of inner precoder as a transition matrix, either inner or outer precoder matrix can be selected according to the long-term/wideband channel properties. The decision which precoder matrix will target long-term/wideband channel properties is FFS.

Decision: The document is noted.

R1-102959	Feedback design and signaling considerations for double codebook operation	Nokia, Nokia Siemens Networks	

The document was presented by Timo Roman from Nokia and concludes with the following proposals:

- Adopt as baseline wideband long term W1 and narrowband short term W2 feedback based on dual codebook reporting in the form of a single feedback report embedding both W1 and W2 over PUSCH.
  - Allow for narrowband short term W2 feedback based on a single codebook as special case by setting the precoder for W1 to the identity matrix.
- Reuse similar periodic and aperiodic closed loop CSI compression schemes as in LTE (Aperiodic modes 1-2, 2-2, and 3-1; Periodic modes 1-1, and 2-1)
  - Assume same subband sizes and other BW dependent parameters as in Rel-8.
- Reuse similar CSI signalling principles as in LTE Rel-8 by mapping the W1 and W2 on the resources used for RI and PMI, respectively.

Decision: The document is noted.

R1-102904	Two-Level Codebook design for MU-MIMO enhancement	ZTE	

The document was presented by Ruyue Li from ZTE and deals with a method of enhancing feedback accuracy for MU-MIMO by using 2-level codebook, having the following advantages:

- Low implementation complexity (including low codeword searching complexity and good backward compatibility)
- Same technique can be applied to both for 4Tx and 8Tx.
- Good performance both in correlated and uncorrelated channel
- Small feedback overhead – potentially less overhead than Rel-8
- Support dynamic switching between Rank2 SU and Rank1 MU very easily

Decision: The document is noted.

R1-103107	Feedback of Long Term Channel Information for Adaptive Codebook	Huawei	

The document was presented by Yang Tang from Huawei and deals with a double codebook approach, where one codebook is used to quantize/feedback the long term channel info and the other codebook is used to quantize/feedback the short term channel info.
A 6-bit codebook design for the channel statistics is presented, while the 4-bit Rel. 8 codebook is reused as the baseline codebook. System level simulation results demonstrate that significant performance gain can be achieved via adaptive codebook, with a reasonably low feedback overhead.
Different signaling approaches in conveying the long term channel information are further discussed. The one-shot feedback approach could be used for its simplicity, or a two shot approach for possibly greater reliability. Further study would also be helpful in striking a desirable balance between feedback reliability and efficiency.
Decision: The document is noted.

For the sake of saving meeting time, Mr Chairman apologized to companies who haven't had a chance to present their paper and decided to look at some WF

R1-103332	WF on UE Feedback	Ericsson, NTT DoCoMo, Samsung, CATT, Texas Instruments, Panasonic, Nokia, Nokia Siemens Networks, Philips, LG Electronics, Motorola, ST-Ericsson, AT&T, Sharp, Mitsubishi Electric, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, NEC, Huawei, ZTE, Fujitsu	

The document was presented by George Jöngren from Ericsson. WF also supported by CMCC.
Discussion (Question / Comment): Marvell requested to reflect that W1 is not necessarly fed back. Mr Chairman responded that it was already clear and agreed in previous meeting.
Samsung requested that the agreement shall also cover the second WF in R1-103324 as it brings further clarification to the matrix multiplication.
Decision: The document is noted and is agreed assuming the following notes:

- Study further precoders that do not obey the properties described in the 3rd bullet.
- Note that statements regarding achieving maximum array gain do not preclude further study of other alphabets e.g. 8PSK
- FFS whether matrix multiplication in first bullet means W1xW2 and/or W2xW1.

R1-103324	Way Forward on Rel. 10 UE Feedback	Samsung, ETRI, Pantech, Intel, Toshiba, NEC, ZTE	

Decision: The document is noted.

R1-103325	Joint Proposal on Rel. 10 UE Feedback	Samsung, ZTE, Intel, NEC	

Decision: The document is noted.

Friday 14th

R1-103419	Way-forward on CSI Feedback Design for Rel-10 DL MIMO	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT, Ericsson, Huawei, LG Electronics, Marvell, Mitsubishi Electric, Motorola, Nokia, Nokia-Siemens-Networks, NTT DOCOMO, Panasonic, Qualcomm, Samsung, Sharp, ST-Ericsson, Texas Instruments, ZTE	

The document was presented by George Jöngren from Ericsson.
Decision: The document is noted and the way forward is agreed.

Not treated.

R1-102658	Performance evaluation of 8Tx precoding codebooks	CATT	
R1-102792	Further evaluation of differential feedback in the context of the Rel-10 two-stage implicit feedback framework	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-102793	Further analysis of companion feedback performance and feedback signalling overhead reduction	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-102823	8Tx codebook design	Texas Instruments	
R1-102824	Multiple PMI feedback for dynamic SU/MU switching	Texas Instruments	
R1-102837	CQI feedback for Downlink MU-MIMO	Pantech	
R1-102875	Further considerations on 8Tx codebook design	Panasonic	
R1-102983	Deriving explicit channel information from PMI	Philips	

R1-103024	Multi-component feedback in support of dynamic switching between SU-MIMO and MU-MIMO in LTE-A	Samsung	
R1-103025	Best companion CQI for MU-MIMO enhancements	Samsung	
R1-103029	Study on periodic feedback of PMI/CQI responding to CSI-RS	Samsung	
R1-103057	MU-MIMO: CQI Computation and PMI Selection	NEC Group	
R1-103068	Feedback Reduction in DL MU-MIMO using Pre-Assigned Companion Subsets	Research In Motion UK Limited	
R1-103069	Companion Subset Based PMI/CQI Feedback for LTE-A MU-MIMO	Research In Motion UK Limited	
R1-103106	Double codebook based Differential feedback	Huawei	
R1-103162	Details of feedback design for 8Tx and 4Tx for LTE-A	Motorola	
R1-103211	Successive Codebook Refinement: Further details and evaluation	Marvell	
R1-103212	Covariance Compression for Codebook Adaptation	Marvell	
R1-103213	Codebook Refinement under Constant-Modulus constraint	Marvell	
R1-103221	Discussion on Feedback Design for LTE-A	Fujitsu	
R1-103222	Considerations on codebook and feedback design	Fujitsu	
R1-103237	Considerations on the Rel-10 feedback framework	CHTTL	
R1-103258	Further views on CSI Feedback for LTE-Advanced	NTT DOCOMO	
R1-103259	Views on CSI Reporting Scheme based on Double Codebook Structure for LTE-Advanced	NTT DOCOMO	
R1-103272	Performance evaluation of Long-term matrix feedback schemes	InterDigital Communications, LLC	
R1-103281	Feedback design concept for Rel-10 extension	Toshiba	
R1-103282	Performance evaluation of Rel-10 feedback extensions	Toshiba	
R1-103283	Further details on Rel-10 feedback	Toshiba	
R1-103323	Discussion on Two-component Feedback Framework for 8Tx	ZTE	(R1-102905)
R1-103328	Two-component Feedback Design and Codebooks	Motorola	(R1-103176)
R1-103330	CSI Feedback Design for Rel-10 DL MIMO	Texas Instruments	
R1-103363	DL codebook for 8TX	Huawei	(R1-103105)
R1-103379	Control signaling to support feedback enhancements in Rel. 10	Samsung	(R1-103028)
R1-103392	Performance Evaluation of LTE-A DL MIMO with 8Tx codebook	ZTE	(R1-102906)

6.3.5 Other

Not treated.

R1-102725	Remaining Issues on Downlink TxD in LTE-A Subframe	LG Electronics	
R1-102825	DL MIMO transmission modes in LTE-A	Texas Instruments	
R1-103030	Discussion on CSI-RS based CQI Reporting for Rel-10	Samsung	
R1-103031	TX diversity on MBSFN subframe	Samsung	

R1-103032	DL transmission modes for Rel-10	Samsung	
R1-103285	Interference Cancelling Block Modulation for Improved Cell-Edge Spectral Efficiency	CEWiT	

6.4 UL Multiple Antenna Transmission

R1-103404	UL RS and UL MIMO Chairman's notes	Ad Hoc chairman (Samsung)	

The document was presented by Charlie Zhang of Samsung and provides the outcomes of the ad-hoc session.
Decision: The document is endorsed and reported as follows in sections 6.4.1 to 6.5.2.

6.4.1 Transmission modes and Signalling requirements

R1-102659	Discussion on signaling of UL MIMO	CATT	
R1-102726	UL Transmission Mode and Control Signaling in LTE-A	LG Electronics	
R1-102760	UL trasmission modes and grants for MIMO transmissions	Qualcomm Incorporated	
R1-102794	UL transmission modes for PUSCH	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-102826	Transmission Modes and Signaling for UL MIMO	Texas Instruments	

Decision: The above set of documents is noted.

R1-103109	Transmission mode configuration and the mapping of PA/Antenna to CC	Huawei	

Decision: The document is noted.

Agreement

- At least two new Rel-10 UE-specific RRC-configured transmission modes for PUSCH of UE with multiple APs:
  - Single-antenna port mode
  - Multi-antenna port mode supporting up to 2 TB (the number of antenna ports depends on the UE capability).
  - FFS whether or not a third RRC-configured multi-antenna transmission mode is needed
- For PUSCH, a dynamic switching between the configured transmission scheme and a single-port fallback scheme with the same DCI format for all RRC configured modes.

R1-103035	UL SU-MIMO precoding in PHICH-triggered retransmissions	Samsung	

Decision: The document is noted.

Agreement

- Specification-based solution is needed. Continue discussion until next meeting on the exact method.

Not treated.

R1-102911	UL transmission Modes and Signalling Requirement for LTE-A	ZTE	
R1-102960	PUSCH SU-MIMO transmission modes	Nokia Siemens Networks, Nokia	(R1-101903)
R1-103034	PMI signaling in DCI format for UL MIMO	Samsung	
R1-103322	Further Discussions on UL MIMO signaling requirements	Samsung	(R1-103033)

R1-103108	Uplink transmission modes	Huawei	
R1-103178	On UL Multi-Antenna Transmission Modes and Signaling Support	Motorola	

6.4.2 PUCCH TxD transmission scheme

Not treated.

R1-102727	Further Evaluations on Transmit Diversity for PUCCH format 2/2a/2b	LG Electronics	(R1-102385)
R1-102761	Transmit diversity for PUCCH format 2	Qualcomm Incorporated	
R1-102913	Multi-antenna transmission scheme for PUCCH format 2	ZTE	
R1-102961	On transmission diversity for PUCCH Format 2/2a/2b	Nokia Siemens Networks, Nokia	(R1-101904)
R1-102986	Evaluations on Transmit Diversity for PUCCH format 2	Potevio	
R1-103036	Transmit Diversity for PUCCH Formats 2/2a/2b	Samsung	
R1-103070	Multiplexing Capacity for LTE-A PUCCH Format 2/2a/2b with Transmit Diversity	Research In Motion UK Limited	
R1-103110	Transmit diversity for PUCCH format 2/2a/2b	Huawei	
R1-103207	PUCCH TxD for Formats 2/2a/2b for LTE-Advanced	Sharp	(R1-102395)

6.4.3 UCI multiplexing on PUSCH in case of SU-MIMO

Not treated.

R1-102631	Design Principles for UCI on PUSCH	Ericsson, ST-Ericsson	
R1-102660	Discussion on UCI transmission in PUSCH	CATT	
R1-102728	Consideration on UCI and PUSCH Data Multiplexing Scheme in Multi-layer PUSCH Transmission	LG Electronics	
R1-102762	UCI multiplexing for SU-MIMO transmission	Qualcomm Incorporated	
R1-102795	UCI multiplexing on PUSCH in case of SU-MIMO	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-102827	Data and Control Multiplexing for UL Multi-Antenna Transmission	Texas Instruments	
R1-102876	UCI multiplexing on PUSCH with MIMO transmission	Panasonic	
R1-102910	UCI Multiplexing on PUSCH with MIMO Transmission	ZTE	
R1-102962	Performance evaluation of UCI multiplexing schemes on PUSCH in case of SU-MIMO	Nokia Siemens Networks, Nokia	
R1-103037	Further Disucssions on Data and Control Multiplexing in UL MIMO Transmissions	Samsung	
R1-103111	Comparison of of Multiplexing Schemes of control and data in multi-layer PUSCH transmission	Huawei	
R1-103180	UCI Multiplexing on PUSCH in UL-MIMO Transmissions	Motorola	
R1-103208	Performance issues for UCI transmission on PUSCH with SU-MIMO	Sharp	

R1-103329	UCI Multiplexing on PUSCH for Rel-10 UL SU-MIMO	Texas Instruments	

Decision: The document is noted.

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Take the following as agreement for both single CC and multi CC:

- HARQ-ACK and RI:
  - Replicated across all layers of both CWs
  - TDM multiplexed with data such that UCI symbols are time-aligned across all layers
    - FFS: How to determine the number of UCI symbols on each CW and each layer
- CQI/PMI: transmitted only on 1 codeword
  - Reuse Rel-8 multiplexing and channel interleaving mechanisms
    - Extension: The input to data-control multiplexing { $q_0, q_1, q_2, q_3, ..., q_{Q_{CQI}-1}$, $f_0, f_1, f_2, f_3, ..., f_{G-1}$ } is grouped into column vectors $\underline{g}_0, \underline{g}_1, \underline{g}_2, \underline{g}_3, ..., \underline{g}_{H'-1}$ of length Q_m*L
      - L (1 or 2) is the number of layers the CW is mapped onto
      - Enable time (RE) alignment across 2 layers for L=2
  - UCI symbol-level layer mapping: same as (treated as a part of) data
  - FFS: Mechanism for CW selection

6.4.4 Other

PHICH

R1-102729	PHICH Resource Assignment for UL SU-MIMO in LTE-A	LG Electronics	
R1-102796	Cyclic shift mapping of PHICH resources for UL MIMO	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-102829	Further details on PHICH for UL SU-MIMO	Texas Instruments	
R1-103192	PHICH mapping for UL SU-MIMO	Nokia Siemens Networks, Nokia	
R1-103197	PHICH Resource Allocation Method for UL SU-MIMO	ETRI	
R1-103244	PHICH for SU-MIMO	NTT DOCOMO	

Decision: The above set of documents is noted.

Agreement

Continue discussion until RAN1#61bis, to decide on one of the three following solution.

For a single CC UL MIMO transmission, the PHICH resources for CW1 and CW2 are identified by

- The CSI value associated with the PUSCH transmission
- Different PRB indices for the PUSCH, assuming more than one PRBs for the transmission
- (I,Q) branches of a QPSK symbol within one PHICH group

CW to layer mapping

Not treated.

R1-102763	Rank 2 precoder performance for 4Tx	Qualcomm Incorporated	
R1-102828	Specifying Basic Building Blocks of UL Multi-Antenna Transmission	Texas Instruments	
R1-102912	Consideration on ACK transmission for multi-antenna PUCCH Format 2b in LTE-A	ZTE	
R1-102963	Performance evaluation on UL SU-MIMO channel interleaver	Nokia Siemens Networks, Nokia	(R1-101906)
R1-103112	Design of codeword to layer mapping for UL MIMO	Huawei	
R1-103223	Codeword to Layer Mapping for Multiple Layers MIMO Systems	Fujitsu	

6.5 Uplink RS issues relevant to LTE-A Work Items

6.5.1 DM RS

6.5.1.1 OCC

R1-103113	Email discussion summary of sequence/group hopping for OCC support in UL DMRS enhancement	Huawei	

The document was presented by Ms Yuan Xia from Huawei.
Decision: The document is noted.

Agreement

- Rel-8/9 cell-specific enabling or disabling of SGH is available in Rel-10
- In order to improve the inter-cell interference randomization for MU-MIMO with different bandwidth pairing, 14 companies are OK to consider defining a new mechanism for the Rel-10 and beyond UE if there is no big standardization effort.
- A new mechanism should show benefit in performance
- Continue discussion in the next meeting, including application scenarios

Not treated.

R1-102632	Uplink DM-RS Resource Configuration for LTE-Advanced	Ericsson, ST-Ericsson	
R1-102730	Further Considerations on UL DM-RS for LTE-Advanced	LG Electronics	
R1-102764	Conveying OCC for PUSCH transmissions	Qualcomm Incorporated	
R1-102839	CS and OCC for Uplink DM-RS Design in LTE-A	Pantech	
R1-102877	OCC and CS for UL DMRS in SU/MU-MIMO	Panasonic	Update from R1-102038
R1-102964	OCC configuration and sequence group hopping	Nokia Siemens Networks, Nokia	
R1-103038	UL DMRS Aspects in Rel-10	Samsung	
R1-103114	Methods to support OCC in sequence hopping/ group hopping configuration	Huawei	
R1-103186	OCC with Sequence Hopping for Uplink DM-RS	Motorola	
R1-103209	Design of OCC for DMRS	Sharp	
R1-103240	OCC configuration for uplink DM-RS	Mitsubishi Electric	
R1-103307	UL DMRS design with OCC	CATT	(R1-102682)

6.5.1.2 Other

Not treated.

R1-102878	CM reduction for UL RS on multiple component carriers	Panasonic	
R1-102965	Cyclic shift configuration with SU-MIMO	Nokia Siemens Networks, Nokia	(R1-101910)
R1-103058	CM reduction of UL RS for carrier aggregation in LTE-A	NEC Group, NTT DOCOMO	

6.5.2 SRS

6.5.2.1 Details of dynamic aperiodic SRS

R1-102879	Discussion on dynamic aperiodic SRS for LTE-Advanced	Panasonic	Update from R1-102040
R1-102661	Aperiodic SRS transmission in LTE-A	CATT	
R1-102731	Dynamic Aperiodic Sounding for LTE-Advanced	LG Electronics	
R1-102765	Further details on aperiodic dynamic SRS	Qualcomm Incorporated	
R1-102797	Triggering of dynamic aperiodic SRS	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-102830	Signaling considerations for dynamic aperiodic SRS	Texas Instruments	
R1-102841	Further Consideration on Aperodic SRS signaling	Pantech	
R1-102846	Views on UL-Grant Based Aperiodic SRS	MediaTek	
R1-102966	Dynamic aperiodic SRS	Nokia Siemens Networks, Nokia	
R1-102978	View on Detail Design of Dynamic Aperiodic SRS	KDDI	
R1-103039	Resources for Dynamic SRS Activation and SRS Multiplexing in Rel-10	Samsung	
R1-103071	Aperiodic SRS with Configurable Duration	Research In Motion UK Limited	
R1-103115	Sounding procedure and design for aperiodic sounding	Huawei	
R1-103156	Aperiodic SRS Design for LTE-A	Motorola, CMCC	
R1-103210	Further discussion on Dynamic Aperiodic SRS	Sharp	
R1-103215	Aperiodic sounding reference signals for release 10	Ericsson, ST-Ericsson	
R1-103224	On resource allocation of dynamic aperiodic SRS	Fujitsu	
R1-103260	Views on Aperiosic Sounding Scheme	NTT DOCOMO	
R1-103337	Proposal on aperiodic SRS duration	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Huawei, LG Electronics, Motorola, Nokia, Nokia Siemens Networks, Sharp, Research In Motion, Texas Instruments	
R1-103336	Proposal for UL sounding resource extension	Huawei, CMCC, Fujitsu, HTC, Potevio, RIM, TI	

Decision: The above set of documents is noted.

Agreement

- One-shot SRS transmission is supported.
- In case of DCI format 0 is used for SRS triggering, size of DCI format 0 remains the same as defined in Rel-8 at least in common search space
- Continue email discussion until RAN1#61bis, Rapporteur (Anthony Ekpenyong, TI)
  - Support of other SRS durations is FFS
  - Resources used for aperiodic SRS
  - Support of aperiodic triggering by DL grant?
  - In case of UL triggering, allow triggering without PUSCH grant?
  - Support of group triggering

Not treated.

R1-102840	Further Consideration on Aperiodic SRS solutions	Pantech	
R1-103187	LTE-A Dynamic Aperiodic SRS - Duration, Timing, and Carrier Aggregation	Motorola	

6.5.2.2 Other enhancements

Not treated.

R1-102662	Considerations on increasing SRS multiplexing	CATT, Potevio	
R1-102798	Summary of SRS enhancements	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-102967	Channel sounding enhancements for LTE Advanced uplink	Nokia Siemens Networks, Nokia	
R1-103116	Sounding extension using DMRS	Huawei	
R1-103188	Other SRS Enhancements for LTE-A	Motorola	
R1-103193	Increasing sounding resources for Rel-10	Texas Instruments	
R1-103241	SRS Assignment for UL MIMO	Mitsubishi Electric	
R1-103261	Periodic SRS for Multi-antenna Transmission	NTT DOCOMO	

6.6 Relaying

6.6.1 Backhaul design for Type1 relays

6.6.1.1 Remaining issues on timing relation between eNB and RN

Uplink

R1-103326	WF on relay UL timing	Ericsson, ST-Ericsson, Huawei, LG Electronics, HTC, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT	

The document was presented by Christian Hoymann from Ericsson. WF also supported by ETRI and ITRI.
Discussion (Question / Comment): Vodafone believes that it is prematured to support "case 2b" for TDD case.
Decision: The document is noted and is modified and agreed in R1-103393.

R1-103395	[draft] LS on UL timing between eNB and relay	Ericsson	

Decision: The document is noted and final LS in agreed in R1-103399.

Following documents didn't require further presentation. CATT commented that R1-102663 was relevant to downlink as well.

R1-102663	Remaining Issues on eNB/RN Frame Timing in LTE-A	CATT	
R1-102766	Access-backhaul timing relationship for UL	Qualcomm Incorporated	

Downlink

R1-102633	Discussion on Un Starting Times	Ericsson, ST-Ericsson	

The document was presented by Christian Hoymann from Ericsson and concludes that the start timing of Un channels, where s1 and s2 are (semi-)statically configured in the range $s1 = s2 \leq$ DL symbol #3 shall be the prefered choice.

Discussion (Question / Comment): CATT commented that alt 2 may not be the best for PDCCH interleaving reason (how is it done?).
Decision: The document is noted.

R1-102664	Transmission timing of R-PDCCH and R-PDSCH	CATT	

The document was presented by Zukang Shen from CATT and proposes:

- Proposal 1: Alt 1-1 is supported for R-PDCCH/R-PDSCH starting time
  - The starting OFDM symbol for R-PDCCH is fixed and late enough to guarantee its reception at RN.
  - RN's PDCCH duration in DL backhaul subframes is semi-static configured.
  - eNB can dynamically vary its PDCCH duration in DL backhaul subframes and shall convey its CFI to RNs via R-PDCCH.
  - R-PDSCH transmission can precede R-PDCCH in a DL backhaul subframe.
- Proposal 2: R-PDSCH ending time is tied to the employed eNB/RN DL timing Case.

Discussion (Question / Comment): Huawei, RIM believe that dynamic change for every subframe is not relevant.
Decision: The document is noted.

R1-102699	Starting symbol of R-PDCCH and R-PDSCH	LG Electronics	

The document was presented by Hanbyul Seo from LGE and proposes Alt 1-2 where the R-PDCCH starting symbol is fixed to symbol #3 while (R-)PDSCH starting symbol is semi-statically configured in PRB(s) not containing R-PDCCH.
Decision: The document is noted.

R1-102767	Starting OFDM symbol for R-PDCCH	Qualcomm Incorporated	

The document was presented by Wanshi Chen from Qualcomm and proposes the adoption of Alt 1-1 for relay backhaul operation.
Decision: The document is noted.

R1-102880	DL backhaul starting timing of R-PDCCH and R-PDSCH	Panasonic	Update of R1-102041

The document was presented by Ms Ayako Iwata from Panasonic and shows preference to Alt 2 with a joint semi-static configuration for the starting symbol of R-PDCCH and R-PDSCH. OFDM symbol #3.
Decision: The document is noted.

R1-102914	Starting symbols for R-PDCCH and R-PDSCH	ZTE	

The document was presented by Yifei Yuan from ZTE and concludes:

- R-PDCCH start symbol fixed to #3.
- (R-)PDSCH starting symbol can be configured to #2 or #3 in PRB(s) not containing R-PDCCH. RN is informed of the configuration via R-PDCCH.

Decision: The document is noted.

R1-102969	On DL Backhaul Control Channel Design Aspects	Nokia Siemens Networks, Nokia	

The document was presented by Jari Lindholm from NSN and makes the following proposals.

- DL backhaul control starting points for all RNs shall be statically configured as symbol #3.
- For frequency-localized resource mapping there is no need for joint interleaving of R-PDCCHs in case CRS or DM RS are scheduled.
- For distributed resource mapping joint interleaving as in Rel-8 shall be reused for R-PDCCHs in case only CRS are scheduled.
- Backhaul data transmissions can be mapped to the 2nd slot in the PRBs which contain
  - CRS-based R-PDCCH for DL grant with frequency-localized mapping or frequency-distributed mapping, or
  - DM RS-based R-PDCCH for DL grant with frequency localized mapping.
- R-PDCCH search space in 2nd slot is configured by higher-layer signaling.

Decision: The document is noted.

R1-103118	Starting time of R-PDCCH&R-PDSCH	Huawei	

The document was presented by Philippe Sartori from Huawei and proposes that Alt 1-2 is adopted, and applies to the cases when only DL assignments or UL grants are present.
Decision: The document is noted.

Alt 1-1: CATT, Qualcomm, ZTE
Alt 1-2: Huawei, LGE, Nokia, NSN, Motorola, NEC
Alt 2: Ericsson, ST-Ericsson, Panasonic, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, RIM, Samsung

Alt 1-2 is agreed.

Companies confirmed that there was no need to look at the following papers.

R1-102799	UL timing for TDD relay	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-102917	Timing between RN and eNB in TDD	ZTE	
R1-102918	Simulation study on downlink RN to RN interference	ZTE	
R1-102992	UL timing synchronization for TDD relay	Potevio	
R1-103117	Clarification of Optional for DL RN Timing support	Huawei	
R1-103231	UL Backhaul Timing for TDD Relay	CMCC	

6.6.1.2 Backhaul control channel design

RPHICH

The Working Assumption that there is no R-PHICH is confirmed.

Not treated.

R1-102801	Need for R-PHICH	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-103262	On the Need of R-PHICH for Backhaul Link	NTT DOCOMO	

R-PDCCH/R-PDSCH multiplexing

R1-103341	Summary of R-PDCCH mapping and related	ZTE	

The document was presented by Yifei Yuan from ZTE and shows the outcomes of off line discussion.
Discussion (Question / Comment): W.r.t "Interleaving/search space with frequency distributed mapping", no interleaving is supported by Panasonic, LGE, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Huawei as well.
Decision: The document is noted.

R-PDSCH transmission in second slot (including DL grant only)

R1-103339	WF on Multiplexing Un DL data and DL grant	LGE, ZTE, Huawei, ETRI, Motorola, CATT, Research In Motion, Samsung, Texas Instruments, HTC, CMCC, LG-Nortel, Pantech	

The document was presented by Hanbyul Seo from LGE.
Decision: The document is noted and is modified and agreed in R1-103400.

R1-102665	Multiplexing of R-PDCCH and R-PDSCH	CATT	

The document was presented by Zukang Shen from CMCC and proposes:

- The 2nd slot of R-PDCCH RB pairs can be used for R-PDSCH transmission.

- If Rel-8 CRS is configured for R-PDCCH demodulation, UL grants can be transmitted either in the first or second slot. R-PDCCHs from multiple RNs are interleaved across the set of assigned R-PDCCH RB pairs. Interleaving is separately performed in the 1st and 2nd slot. Rel-8 PDCCH CCE/REG design can be reused.
- If Rel-10 DM RS is configured for R-PDCCH demodulation, UL grants are transmitted in the second slot. Interleaving of multiple RNs' R-PDCCHs on the same R-PDCCH RB is not supported. R-PDCCH blind decoding is on a per RB or a per RB set basis. The R-PDCCH RB aggregation levels and blind decoding attempts can be predefined. R-PDCCH-to-RE mapping shall follow the frequency first principle.
- No additional standardization for the UL grant alone case.

Decision: The document is noted.

UL grant only case ~~(with DMRS or non-interleaving of CRS)~~
The following is agreed:

- UL grants are only transmitted in the second slot (never in the first slot)
  - No data transmission in the first slot
  - FFS in case of SPS (await any news from RAN2)

Interleaving/search space with frequency localized mapping

R1-103342	WF on R-PDCCH interleaving with CRS	ZTE, Huawei, NEC, Nokia, NSN, CATT, Qualcomm Inc., CMCC, LG-Nortel, RIM, HTC, ETRI	

The document was presented by Yifei Yuan from ZTE
Decision: The document is noted.

In CRS case, if intra-PRB interleaving among different R-PDCCHs in a PRB were to be supported, would it be the Rel-8 PDCCH-type interleaving?

- Yes: Qualcomm, ZTE, Motorola, LGE, LG-Nortel, NEC, RIM, CATT, Vodafone, Huawei, Samsnug, Nokia, NSN, Panasonic, CMCC, Ericsson, ST-Ericsson
- No: -

In CRS case, is Rel-8 PDCCH-type intra-PRB interleaving among different R-PDCCHs in a PRB supported?

- Yes: CATT, Samsung, NEC, ZTE, Huawei, Qualcomm, LG-Nortel, Nokia, NSN, Vodafone
- No: Panasonic, Ericsson, ST-Ericsson, LGE, RIM, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Motorola

Topic is left from now and off line discussion shall continue on whether packing/interleaving is supported.

Boundary adjustment for DL/UL grants

- It is agreed that boundary between UL and DL grants is at the slot boundary.

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R1-103426	WF on R-PDCCH Interleaving with CRS	ZTE, Qualcomm, Panasonic, LGE, Samsung, Alcatel-Lucent, Alcatel Shanghai Bell, Vodafone, HTC	(R1-103342)

Decision: The document is noted and is for email approval until May 28th.

Reference signals

R1-103394	Way Forward on Un DM-RS Pattern for DL timing case 3	CMCC, ZTE, Huawei, LGE, CATR, CATT, Ericsson, ST-Ericsson, RIM, Panasonic, Vodafone	

The document was presented by … from CMCC
Discussion (Question / Comment): More a summary/status of current views than a way forward.
Decision: The document is noted and is agreed. Note that this does not imply any particular agreed value for the maximum rank of the Un.

R1-102770	DM-RS for R-PDCCH	Qualcomm Incorporated	

The document was presented by Wanshi Chen from Qualcomm and proposes that the UE-RS pattern for normal subframes be adopted as the DM-RS pattern for R-PDCCH for DL Case 1 timing, and a variant of the UE-RS pattern for DL Case 3 timing. The same DM-RS design could also be adopted for R-PDSCH.
Decision: The document is noted.

R1-102968	Discussions on Backhaul Reference Signal Design	Nokia, Nokia Siemens Networks	

The document was presented by Jari Lindholm from NSN and proposes for rank of backhaul transmissions:

- Rank 1 for R-PDCCH is the baseline
- Necessity of Rank 2 for R-PDCCH needs careful studies

Discussion (Question / Comment): .
Decision: The document is noted.

Working assumption: Only Rank 1 is supported for R-PDCCH for a given RN

Not treated.

R1-102634	Considerations on R-PDCCH design	Ericsson, ST-Ericsson	
R1-102666	Considerations on Relay Backhaul Control Channels in LTE-A	CATT	
R1-102667	Design of Relay Reference Signal on Backhaul in LTE-A	CATT	
R1-102700	Backhaul Control Channel Design in Downlink	LG Electronics	
R1-102701	Consideration on Relay PUCCH design	LG Electronics	
R1-102768	Details on R-PDCCH	Qualcomm Incorporated	
R1-102769	On data transmission in RB used for R-PDCCH	Qualcomm Incorporated	
R1-102800	R-PDCCH Multiplexing	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-102881	R-PDCCH placement	Panasonic	Update of R1-102042
R1-102882	DCI formats for R-PDCCH	Panasonic	
R1-102915	The mapping schemes of R-PDCCH	ZTE	
R1-103040	R-PDCCH search space design	Samsung	
R1-103041	R-PDCCH multiplexing	Samsung	
R1-103042	R-PDCCH CCE mapping	Samsung	
R1-103061	Further details of the R-PDCCH and R-PDSCH/PDSCH multiplexing	NEC Group	
R1-103062	Supporting frequency diversity and frequency selective R-PDCCH transmission	NEC Group	
R1-103063	R-PDCCH blind decoding for frequency diversity and frequency selective R-PDCCH transmission	NEC Group	
R1-103119	Comparison between PDCCH and R-PDCCH for Type1 Half Duplex Relay	Huawei	
R1-103120	R-PDCCH Multiplexing for DL Grant Only and UL Grant Only	Huawei	
R1-103144	Consideration regarding the numer REGs in R-PDCCH	LG-Nortel	
R1-103145	R-PDCCH Multiplexing for LTE-A relay node	LG-Nortel	
R1-103173	Backhaul control channel design	Motorola	

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R1-103232	Clarification on R-PDCCH	CMCC	

6.6.1.3 HARQ

R1-102635	Summary of email discussion on Way Forward on Un HARQ Timeline (FDD)	Ericsson	

The document was presented by Lars Lindbom from Ericsson and proposes:

- The position and the number of available Un UL subframes are derived from the configuration of Un DL subframes
  - A Un UL subframe is allocated 4 TTIs after a Un DL subframe
- Support the following implicit timing for Un HARQ:
  - UL data transmission happens in subframe #(k+4) if UL grant is transmitted in subframe #k
  - UL ACK/NACK feedback for DL data transmission in subframe #k is transmitted in subframe #(k+4)
- UL HARQ re-transmissions are synchronous wrt the HARQ process ID
  - UL re-transmissions are transmitted in the subframe corresponding to the same UL HARQ process Id as the initial transmission
    - UL HARQ process IDs depend on the UL subframe allocation
  - UL HARQ process ID is not indicated by (R-)PDCCH
- Whether standalone Un DL subframes not followed by a Un UL subframe can be allocated is FFS

Discussion (Question / Comment): Mr Chairman asked whether that proposal was identical to the way forward in R1-103337 → yes.
Alcatel-Lucent commented that the Un subframe configuration is out of the scope of RAN1. No need to set the limit in the Un UL subframe allocation in RAN1.
Decision: The document is noted. The WF in R1-103327 is revised in R1-103401 for email approval until May 27th.

R1-103327	WF on Un HARQ timeline (FDD)	Ericsson, ST- Ericsson, Nokia, Nokia Siemens Networks, Huawei, RIM, Panasonic, NEC, ITRI, InterDigital, ZTE, CATT	

Mr Chairman concluded the session trying to figure out where RAN1 stands with regards to the progress of this WI. He thanked Hidetoshi Suzuki (Panasonic) and Christian Hoymann (Ericsson - as rapporteur of the WI) for their hard work. Most of key aspects have been covered and the results should not affect the work for other WGs to make further progress. Some details need to be tided up in RAN1.

Not treated.

R1-102636	Un HARQ timing for FDD	Ericsson, ST-Ericsson	
R1-102637	Un HARQ timing for TDD	Ericsson, ST-Ericsson	
R1-102668	Backhaul subframe allocation and HARQ operation	CATT	
R1-102702	Backhaul Subframe Allocation for FDD	LG Electronics	
R1-102703	Backhaul Subframe Allocation for TDD	LG Electronics	
R1-102771	Views on HARQ timeline for relays	Qualcomm Incorporated	
R1-102802	HARQ timing for type 1 relay	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-102883	UL/DL HARQ timing for backhaul	Panasonic	Update from R1-102044
R1-102884	Comparison of UL/DL HARQ for backhaul	Panasonic	
R1-102916	Backhaul UL Subframe Allocation in TDD LTE-A Relay	ZTE	

R1-102970	Issues on HARQ over Un Interface for FDD In-band Relay	Nokia, Nokia Siemens Networks	
R1-102971	Discussion on Symmetry and Asymmetry SF Allocation for Backhaul	Nokia, Nokia Siemens Networks	
R1-103043	Backhaul subframe allocation and HARQ timing for TDD	Samsung	
R1-103044	HARQ operation in Un link	Samsung	
R1-103121	Un HARQ Timing for FDD	Huawei	
R1-103122	Un subframe allocation for FDD	Huawei	
R1-103174	Relay HARQ	Motorola	
R1-103226	Backhaul HARQ Timing for LTE-A TDD	Fujitsu	

6.6.2 Other

Not treated.

R1-102638	On the standardisation impact of re-using the PDCCH on Un	Ericsson, ST-Ericsson	
R1-102639	On the feasibility of single-transceiver relay design	Ericsson, ST-Ericsson	
R1-102669	System Evaluation of Relay Performance	CATT	
R1-102772	Enabling range expansion for Type I relays	Qualcomm Incorporated	
R1-102773	DL performance for Type I relays with and without range expansion	Qualcomm Incorporated	
R1-102972	Type-1 Relay Performance for Uplink	Nokia, Nokia Siemens Networks	(R1-101919)
R1-103045	Inter-cell CSI-RS design considering Type 1 Relay	Samsung	
R1-103072	Serving Cell Selection in a Heterogeneous network with Type 1 Relay	Research In Motion UK Limited	
R1-103123	Frequency diversity techniques and rate-matching for R-PDCCH	Huawei	
R1-103233	36.814 CR0001 (Rel-9, F) Clarification for inband Relay definition	CMCC	
R1-103234	36.912 CR0008 (Rel-9, F) Mirror clarification for inband Relay definition	CMCC	
R1-103263	Combination of Carrier Aggregation and Relay in Rel-10	NTT DOCOMO	
R1-103278	Asymmetric carrier configuration for Relay operation	ITRI	

6.7 Network Based Positioning Support for LTE

R1-103300	Chairman notes and remaining issues for UTDOA Telephone Conference	Ad hoc chair (NTT DoCoMo)	

The document was presented by Tetsushi Abe from NTT DoCoMo and shows the outcomes and conclusions from the ad-hoc telco.
Decision: The document is noted and endorsed.

As more time is required for off line discussion, a slot in the schedule is made available on Wednesday morning 8AM. Review could be made in same slot on Thursday morning.

R1-102803	UTDOA Modeling and Performance	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Fang-Chen Cheng from Alcatel-Lucent and provides further analysis of the modeling of the system simulations for the UTDOA technology evaluation. Three key variables in the UTDOA simulation assumptions are identified:

- RS selection
- Interference modeling
- Power control

Discussion (Question / Comment): .
Decision: The document is noted. For further discussion during the week.

R1-103292	Discussion on evaluation for network based positioning	Ericsson	

The document was presented by Dirk Gerstenberger from Ericsson and is a resubmission of telco paper [R1-102588].
Decision: The document is noted. For further discussion during the week.

R1-103304	UTDOA Evaluation Assumptions	TruePosition	Resubmission of R1-102587

The document was presented by Simon Isskav from TruePosition.
Decision: The document is noted. For further discussion during the week.

Friday 14th

R1-103410	Chairman's note on simulation assumptions for UTDOA	Ad Hoc chairman (NTT DoCoMo)	

The document was presented by Tetsushi Abe from NTT DoCoMo and summarizes the UTDOA ad-hoc discussion.
Decision: The document is noted and endorsed.

6.8 Enhanced ICIC for non-CA based deployments of heterogeneous networks for LTE

WID RP-100383

General

R1-103059	Classification of eICIC candidate schemes	NEC Group	

The document was presented by … from NEC and proposes the following classification of eICIC candidate schemes:

- Rel-8/9 schemes: Existing technologies which are already defined in specifications and new technologies which are captured in TR36.921 which do not need to be standardized.
- Non-Rel-8/9 schemes: New technologies which are not captured in TR36.921 and not defined in specifications, furthermore, the captured technologies in TR36.921 which need to be standardized.
- Unclassified schemes: New technologies which potentially has both aspects Rel-8/9 schemes and Non-Rel-8/9 schemes.

TR36.921, "FDD Home eNodeB (HeNB) Radio Frequency (RF) requirement analysis"
Discussion (Question / Comment): Motorola commented that some schemes may be propriatory.
Decision: The document is noted.

R1-102974	HetNet interference management needs and candidate solutions	Nokia Siemens Networks, Nokia	

The document was presented by … from NSN and focuses on macro+HeNB downlink performance as the most critical case where standardization of interference management techniques may be needed. Following proposals are listed:

- Proposal 1: Study simple HeNB PC algorithms to be standardized for Rel-10.
- Proposal 2: Backward compatible resource partitioning between macro and CSG HeNB in the frequency domain on a carrier resolution shall be baseline for comparing with other schemes.
- Proposal 3: Study the effect of assuming that macro-UEs in same rooms/apartments as active HeNBs can access those.
- Proposal 4: Further study of plain co-channel deployed macro + pico performance optimization via more optimal serving cell selection and pico node power control for dense deployments. Identify if additional standardization is required, and what the corresponding performance gain equals.

Discussion (Question / Comment): Qualcomm do not agree with the observation that there is no need for standardization of interference management for the macro + pico scenarios.
Decision: The document is noted.

R1-103389	WF on Identification of Co-channel Problem and Needs in Macro-Femto	CATT, CMCC, CATR, HTC, Huawei, KDDI, Kyocera, LGE, Motorola, Nokia, NSN, Qualcomm, RIM, Samsung, Toshiba, ZTE	

The document was presented by Ms Ying Peng from CATT and states for Macro-Femto and Femto-Femto co-channel deployment

- Dominant interference condition has been shown when Non-CSG/CSG users are in close proximity of Femto
  - Rel8/9 ICIC techniques are not fully effective in mitigating interference.
  - Power control can introduce improvement, but it is not always sufficient
- Enhanced interference management is needed

Discussion (Question / Comment): Same conclusion applies Macro-Pico deployment in R1-103390.
Decision: The document is noted.

R1-103390	WF on Identification of Co-channel Problem and Needs in Macro-Pico	CATT, CATR, Huawei, KDDI, Kyocera, Motorola, NTT DoCoMo, Qualcomm	

Decision: The document is noted.

R1-102670	Identification of Co-channel Problems with Het-Net Deployments	CATT	

The document was presented by Ms Ying Peng from CATT and proposes:

- R8 mechanism and potential enhancement, power control (e.g. by HeNB measurement or FUE assistant measurement), can introduce improvement to control channel of Macro-Femto deployment. Besides, additional interference managements are needed, such as MBSFN method.
- In order to solve the LPN UL problem, R8 mechanism, such as power control optimization, is identified workable. Other enhancement for flexible and adaptive adjustment can be further studied.
- RE may be treated as optimization of Macro-Pico deployment to improve the system performance. The UL performance is improved with bias increase, while the DL performance is damaged unless additional IM is applied. When the bias is high, the solutions in Macro-Femto can be considered in this deployment.

Discussion (Question / Comment): Ericsson asked what kind of power control terminology was under consideration. → more power control adjustment (terminology needs to be tuned)
Decision: The document is noted.

Control Channels

R1-102831	Rel-8/9 compatible PDCCH interference mitigation schemes for het-nets	Texas Instruments	

The document was presented by Anthony Ekpenyong from TI and suggests that RAN1 should further study performance degradation in PDCCH/PCFICH/PHICH channel performance in het-nets, including Rel-8/9 compatible ICIC approaches such as a) time-shifting and MBSFN based ICIC approaches and b) using highest CCE aggregation level at macro - eNodeB for transmitting control information for MUEs within range of CSG HeNBs.
For outdoor hotzone cell based het-net deployments, Rel-8 RSRP cell-selection in combination with cellular planning by setting appropriate hotzone cell transmit powers can provide tangible offloading benefits/ throughput gains, while ensuring acceptable control channel performance.
Decision: The document is noted.

R1-102673	Assessment of Control Channel Interference Coordination in Co-channel Het-Net	CATT	

The document was presented by Ms Yeng Ping from CATT and concludes that the interference method via configuring MBSFN subframes can solve the co-channel interference problem although some potential problems, such as unnecessary RLF declaration, still need further work. Considering the tight time limit of the WI project, such kind of method which introduces less implementation complexity and impact to the spec should be studied with higher priority.
Decision: The document is noted.

R1-102804	UE Control Channel Outage Mitigation	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	

The document was presented by Teck Hu from Alcatel-Lucent and proposes methods (new CQI definition, UE specific based solution) for further study of Control Channel eICIC, while at the same time keeping in mind the potential of initial deployment planning in resolving or mitigating somewhat these outage problems.
Decision: The document is noted.

R1-102805	Control Channel Performance for Hetnet	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	

The document was presented by Xiaobo Zhang from Alcatel-Lucent Shanghai Bell and conclude that:

- In an Open Subscriber Group Macro-hotzone co-channel deployment, system performance gains are observed in most cases except for a small degradation to the performance of the cell edge UEs. Techniques to mitigate the interference should therefore consider the complexity of the solutions versus the possible small gains & benefits to the system.

Decision: The document is noted.

R1-103126	Enhanced ICIC for control channels to support HetNet	Huawei	

The document was presented by Jin Wei from Huawei and draws the following observations:

- If no RE is introduced or RE with a small bias value introduced, no control channel enhancement or physical layer air interface modification appears necessary.
- If RE with a larger bias value is introduced or enhancements to ICIC performance to efficiently support highly variable traffic loading are desired, the control channel shrinking solution is superior to partially orthogonal solutions.

Decision: The document is noted.

R1-102678	Interference Management for Control Channels in Outdoor Hotzone Scenario	Kyocera	

The document was presented by … from Kyocera and concludes as:

- ICIC for PDCCH which does not use MBSFN subframe coordination should be specified in Rel-10 to effectively support HetNet with range expansion using at least Rel-8/9 ICIC mechanism for PDSCH.
- While Rel-10 solutions are being addressed, interference mitigation effect for Rel-8/9 UEs should also be considered to accommodate existing Rel 8/9 UEs in HetNet deployments.
- If significant interference mitigation for PDCCH is supported for the case of range expansion with higher bias, protection for other control channels such as PBCH and SCH should be identified without using time shift because that is necessary for operators providing MBMS service.

Decision: The document is noted.

R1-103227	Interference coordination for control channels for HetNet	Fujitsu	

The document was presented by Yoshihiro Kawazaki from Fujitsu and draws the following:

- The use of large cell-selection bias value will seriously degrade the outage performance of Pico UE and this implies that some enhanced interference control techniques will be needed.
- To ensure backward compatibility for Rel8/9 UEs and to minimize the degradation in the control channel performance, time domain approaches in combination with PDCCH interference-robustness improvement techniques in victim pico-cells is worth further consideration.

Decision: The document is noted.

R1-102984	Mitigation of control channel interference	Philips	

The document was presented by Tim Moulsley from Philips and recommends considering potential backwards compatible modifications to the PDCCH in Release 10 in order to mitigate the effects of PDCCH interference between synchronized cells.
Decision: The document is noted.

R1-102704	Coordination for DL control channel in co-channel CSG deployment	LG Electronics	

The document was presented by … from LGE and deals with the coordination of DL control channel when MeNB and HeNB share the same spectrum. It is proposed to employ the symbol-level time offset between HeNB and MeNB and the RE puncturing (or rate matching) in DL transmission of HeNB as the DL control channel coordination.
Decision: The document is noted.

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R1-102618	Considerations on non-CA based heterogeneous deployments	Ericsson, ST-Ericsson	

The document was presented by Lars Lindbom from Ericsson and proposes introducing inter-subframe scheduling to exploit the use of almost blank subframes as a tool for ICIC of control channels in non-CA based heterogeneous deployments. One observation was that UE measurements might need to be restricted to certain subframes, for which two alternatives have been identified:

- Alternative 1: In case of restricting UE measurements to certain subframes, the UE base measurements on a set of subframes signaled by higher layer.
- Alternative 2: In case of restricting UE measurements to certain subframes, the UE base measurements on synchronization signals (i.e. measurements restricted to subframe #0 and #5).

Discussion (Question / Comment): Concerns were raised on backward compatibility of both alternatives.
Decision: The document is noted.

R1-102894	Control and data channel performance evaluations for co-channel deployment with MeNBs and outdoor Picos	ZTE	

The document was presented by … from ZTE and deals with performance evaluations for both control and data channel in a co-channel deployment with Macro eNBs with outdoor Pico cells, assuming no enhanced interference management techniques. The paper concludes that, if eICIC is not used, the biased cell selection criterion may bring unintended performance degradation especially for large bias value. Bias value smaller than 6 dB is recommended if biased cell selection is used.
Decision: The document is noted.

R1-103046	PDCCH Extension for ICIC and Capacity	Samsung	

The document was presented by Aris Papasakellariou from Samsung and proposes the definition of an Extended PDCCH (E-PDCCH) within the PDSCH region.
Decision: The document is noted.

R1-102814	Non-CA based PDCCH Interference Mitigation in LTE-A	Intel Corporation (UK) Ltd	

The document was presented by Kamran Etemad from Intel and proposes:

- In order to mitigate the co-channel inter-cell interference in PDCCH, the Rel-8 ICIC needs to be extended to cover PDCCH as well.
- Both CCE aggregation level distribution and CCE utilization ratio could be included in the load description for PDCCH. And one extreme case is to have 1 bit as PDCCH overload indicator exchanged over X2.

Decision: The document is noted.

R1-103171	Enhanced ICIC techniques	Motorola	

The document was presented by Robert Love from Motorola and proposes one ICIC technique for mitigating MeNB high interference to HeNB control, namely for the MeNB to coordinate with the HeNB on which subframes it will limit the number of scheduled users.
Decision: The document is noted.

From these presentations, observations in relation to CCHs are listed as follows:

- Increasing small cell selection/handover bias increases the average spectral efficiency but leads to increased CCH outage probability
- An implication is that CCH interference management techniques are potentially useful
- Some limited possibilities for CCH orthogonalisation already exist in Rel-8/9
- Study further which additional standards-impacting CCH interference management techniques / coordination techniques are needed for Rel-10
- Also study impacts on legacy Rel-8/9 UEs.

Then Qualcomm asked what the intention at this stage was? What kind of questions/doubts the proposed WF bring to the group?
Companies are encouraged to look at R1-103389 and R1-103390 and provide feedback to the co-sourcing companies.
Status shall be checked on Friday.

Friday 14th

R1-103416	WF on Identification of Co-channel Problem and Needs in Macro-Femto	CATT, CMCC, CATR, ETRI, HTC, Huawei, Intel, IIR, ITRI, KDDI, Kyocera, LGE, Motorola, NEC, New Postcom, Nokia, NSN, Qualcomm, RIM, Samsung, Toshiba, ZTE	(R1-103389)

The document was presented by Ms Ying Peng from CATT and states for Macro-Femto and Femto-Femto co-channel deployment:

- Dominant interference condition has been shown when Non-CSG/CSG users are in close proximity of Femto
  - Rel8/9 ICIC techniques are not fully effective in mitigating interference.
  - Power setting can introduce improvement, but it is not always sufficient
- Enhanced interference management is needed

Discussion (Question / Comment):

Decision: The document is noted and modified and agreed in R1-103427.

R1-103417	WF on Identification of Co-channel Problem and Needs in Macro-Pico	CATT, CATR, ETRI, Fujitsu, Huawei, ITRI, KDDI, Kyocera, Motorola, NTT DoCoMo, Qualcomm	(R1-103390)

The document was presented by Ms Ying Peng from CATT and states for Macro-Pico deployment:

- Macro-Pico deployment- without any range expansion schemes (scenario 1)
  - DL: No problem for control channel. Reuse Rel8/9 ICIC for data channel
  - UL: Reuse Rel8/9 power control mechanism for both control and data channel.
    - Other enhancement (e.g. power control parameter optimization) FFS
- Macro-Pico deployment – with range expansion schemes (scenario 2)
  - DL: No problem for control channel when bias is low. When bias is high, there is serious control channel interference, in which case Rel8/9 ICIC techniques are not fully effective in mitigating interference and enhanced interference managements are needed. Optimal bias setting is FFS.
  - UL: Reuse Rel8/9 power control mechanism for both control and data channel.
    - Other enhancement (e.g. power control parameter optimization) FFS.
  - Whether range expansion is applied needs further study

Discussion (Question / Comment):

Decision: The document is noted and is for email discussion until 28th May

Not treated.

R1-102619	On cell association in hotzone deployments	Ericsson, ST-Ericsson	
R1-102671	Evaluation of R8/9 Power Control and Enhancements for DL Interference Coordination in Macro-Femto	CATT	
R1-102672	Evaluation of R8/9 Techniques and Enhancements for PUCCH Interferernce Coordination in Macro-Pico	CATT	
R1-102674	Fast Fading Modeling Evaluation for Macro-Pico Deployment	CATT	
R1-102675	Uplink Data Channel Interference Mitigation via Power Control	CATT	
R1-102676	DL Interference Mitigation via Direction Information in Het-Net	CATT, ITRI	
R1-102677	Potential Performance of Range Expansion on Rel-8/9 Techniques	Kyocera	
R1-102705	Methods to facilitate the inter-cell coordination in heterogeneous networks	LG Electronics	
R1-102706	Downlink performance over heterogeneous networks	LG Electronics	
R1-102737	Performance of ICIC Enhancement by Channel measurement in Relay Stations	HTC	
R1-102774	Interference conditions in CSG deployments	Qualcomm Incorporated	
R1-102775	Increasing the footprint of low power nodes for improved performance	Qualcomm Incorporated	

R1-102776	Measurements and feedback extensions for improved operation in HetNets	Qualcomm Incorporated	
R1-102806	HetNet Rel-8/9 Data Channel Performance	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-102807	Consideration on enhancements of Rel. 8 CQI feedback	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-102808	DL Pico/Macro Het Net Performance: Cell Selection	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	
R1-102810	Fairness Consideration for Cell Association Enhancements	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	
R1-102832	Outdoor hotzone cell performance: A cell selection analysis	Texas Instruments	
R1-102844	Hybrid resource partitioning method in the Macro-Pico Co-channel deployment	New Postcom	
R1-102847	Discussion on Inter-cell Interference between PRACH and PUCCH/PUSCH in Heterogeneous Networks	MediaTek	
R1-102885	Possibility of UE side ICI cancellation in Hetnet	Panasonic	Resubmission of R1-102046
R1-102973	Simulation results for Mobility in Heterogeneous Networks	Nokia, Nokia Siemens Networks	(R1-101927)
R1-102975	Downlink CCH performance aspects for macro and HeNB deployment in dense urban scenario	Nokia Siemens Networks, Nokia	
R1-102976	Performance and interference aspects of macro with outdoor pico hotspot	Nokia Siemens Networks, Nokia	(R1-101926)
R1-102977	HeNB power control	Nokia Siemens Networks, Nokia	
R1-102981	Considerations on PBCH ICIC for CSG HeNB	ITRI	
R1-102985	UE assumptions on interference	Philips	
R1-102987	Interference management via power control in the HetNets	Potevio	
R1-103047	ICIC Support for SRS Transmissions	Samsung	
R1-103048	Static/Dynamic Home eNB ICIC function	Samsung	
R1-103049	Performance evaluation of Home eNB ICIC function based on time/frequency domain silencing	Samsung	
R1-103050	Quality Feedback of PDCCH region for Heterogeneous Network	Samsung	
R1-103125	Evaluation of Rel-8/9 techniques and range expansion for macro and outdoor hotzone	Huawei	
R1-103127	Enhanced ICIC and resource specific CQI measurement	Huawei	
R1-103155	Downlink ICIC in heterogeneous networks	TD Tech	
R1-103160	System Performance of HetNet with Pico eNB	Motorola	
R1-103161	Antenna pattern for Pico Cells	Motorola	
R1-103181	On Range Extension in Open-access Heterogeneous Networks	Motorola	
R1-103198	Enhancement of Rel-8/9 ICIC mechanisms considering relays	ETRI	
R1-103214	Downlink data channel performance of interference management for Macro + Outdoor hotzones	ZTE	
R1-103235	Control channel performance considering downlink interference between the femto cells	CMCC	
R1-103264	Performance of eICIC with Control Channel Coverage Limitation	NTT DOCOMO	
R1-103302	View eICIC in Macro-cell and Femto-cell (MeNB-HeNB)	Toshiba	
R1-103387	Cell Association Enhancements for HetNet	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	(R1-102809)

R1-103391	Observations on eICIC for non-CA based HetNets	Kyocera, LGE, Qualcomm, Samsung	

6.9 Other

6.9.1 Rel-10 UE categories

R1-103266	Summary of e-mail Discussion on UE Categories	NTT DOCOMO	

The document was presented by Tetsushi Abe from NTT DoCoMo and proposes to continue the discussion based on R1-103265 taking the other companies' comments and contributions into account, where the first step would be to agree to define Rel-10 UE category in terms of maximum data rate.
Discussion (Question / Comment): .
Decision: The document is noted.

R1-103268	Carrier aggregation within 20 MHz bandwidth for HetNet operation	Ericsson, ST-Ericsson	

The document was presented by Dirk Gerstenberger from Ericsson and proposes:
- Additional (beyond release 9) specified UE functionality that is important for efficient HetNet operation should, as much as possible, be mandatory UE features for release 10 and beyond.
- In particular, downlink carrier aggregation with two component carriers within a 20 MHz bandwidth should be specified and should be a mandatory UE feature for release 10 and beyond.

Discussion (Question / Comment): DL CA with two component carriers within a 20 MHz bandwidth discussion should be synchronized with RAN4. LS from RAN4 is expected during the week.
Samsung asked for the reason limiting the case to DL only.
Decision: The document is noted.

R1-103128	Discussion of UE categories and capabilities	Huawei	

The document was presented by Weimin Xiao from Huawei and proposes to define 3 new UE categories:
- Rel-10 category 1: relative lower end UEs for general market. Needs not to support all the features as discussed in Section 4
- Rel-10 category 2: high end UEs for superior user experience and data heavy market
- Rel-10 category 3: UEs that can take the full advantages of Rel-10 features that may only be needed for special scenarios

Decision: The document is noted.

R1-103348	UE Categories for Rel.10	NTT DOCOMO, AT&T, TeliaSonera, Orange, Deutsche Telekom, Telcom Italia	(R1-103265)

The document was presented by Sadayuki Abeta from NTT DoCoMo and proposes that, for Rel-10 the number of UE categories should be limited as much as possible.
- Limited number of UE categories in Rel-10
  - Higher UE categories should be introduced in Rel. 11 and later according to market demands.
- Support for highest performance UE to identify the potential performance of LTE-Advanced
- Rel-8/9 UE categories should be extended to support Rel-10 intra-band contiguous and inter-band non-contiguous CA.
- The following UE categories should be introduced for Rel-10 intra-band contiguous and inter-band non-contiguous CA:
  - DL: 300 Mbps, UL: 100 Mbps (150 Mbps if 64QAM is supported)
  - DL: 1.2 Gbps, UL: 600 Mbps

Discussion (Question / Comment): Intra-band configuration is unclear to Nokia and they propose to start with identifying the additional UE categories needed for Rel-10 based on the transport channel parameters, same approach as when defining the Rel-8 categories.
CMCC commented that 50MHz aggregation might be useful for TDD.
Vodafone commented that UL-MIMO with 2 layers 10+10MHz should be considered.
Decision: The document is noted. It is noted that details of carrier and band combinations should be discussed in RAN4.

R1-103267	On Rel-10 UE Categories	Ericsson, ST-Ericsson	

The document was presented by Dirk Gerstenberger from Ericsson and proposes that RAN1 starts to discuss the principles for defining the Rel-10 UE capabilities, focusing on the definition of the low-end and high-end categories, including the relation of peak data rate, modulation order, number of layers and CCs. Following that, necessary intermediate categories should be discussed.
Discussion (Question / Comment): Nokia supports independent UL/DL categories. Qualcomm doesn't agree with the suggestion that as a principle two-layer transmission should be preferred over higher order modulation.
Decision: The document is noted.

As a conclusion, clearly more off line discussion is needed (likely the deadline for UE Cat definition is around August). Status will be checked @RAN1#61bis.

6.9.2 Other

Not treated.

R1-103236	On Network Energy Saving for E-UTRAN	CHTTL	

The document was presented by … from …
Discussion (Question / Comment): .
Decision: The document is noted.

7 Closing of the meeting

Mr Chairman thanked RIM for hosting and organizing the meeting and all delegates for their involvement and hard working hours during the all week long.
Experiencing wifi network problems due to other use of wireless equipments (Ipod, BB…) is something to learn for the future. Things improve slightly after the announcement to switch them off.
Finally, Mr Chairman requested to make good use of the longer gap until next meeting for productive email discussions.
The meeting was closed at 17:00.

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Annex A: List of Tdocs at RAN1 #61

Please see excel file attached to this report

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Annex B: List of CRs agreed at RAN1#61

Spec	CR	Rev	Rel	Subject	Cat	TDoc	WI
36.214	15	1	Rel-9	Clarification of RSTD measurement	F	R1-103301	LCS_LTE
25.221	207	1	Rel-8	Clarification for support of an E-HICH pair for 1.28Mcps TDD	F	R1-103310	RANimp-LCRCPC
25.221	208	1	Rel-9	Clarification for support of an E-HICH pair for 1.28Mcps TDD	A	R1-103311	RANimp-LCRCPC
36.213	268	1	Rel-9	Clarification of PRS EPRE	F	R1-103354	LCS_LTE

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Annex C - 1: List of Outgoing LSs from RAN1#61

R1	Response to (Ic LS)	To	Cc	Title	Contact	Ref'd /Attachd Tdoc	Release	WI
R1-103371		R2, R4		LS on uplink power control for carrier aggregation	Ericsson		Rel-10	LTE_CA-Core
R1-103399		R4	R2	LS on UL timing between eNB and relay	Ericsson		Rel-10	LTE_Relay-Core
R1-103405		R2	R4	LS on power headroom reporting for carrier aggregation	Qualcomm Incorporated		Rel-10	LTE_CA-Core
R1-103413	(R4-101260)	R2, R4, R5		LS reply on configurable transmission modes for Category 1 UE	Huawei	R1-103350, R1-103362	Rel-8	-
R1-103414		R2		LS to RAN2 on association between PDCCH with CIF and PDSCH / PUSCH	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell		Rel-10	LTE_CA-Core
R1-103421	(R2-102654)	R2		LS reply on Primary Component Carrier and Semi Persistent Scheduling	Huawei		Rel-10	LTE_CA-Core
R1-103422	R1-101720	R4	R2	Response to LS from RAN4 on simultaneous PUSCH and PUCCH and clustered SC-FDMA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell		Rel-10	LTE_CA-Core
R1-103423		R2, R3		LS on agreements on HS-DPCCH design for 4C-HSDPA	Qualcomm Incorporated		Rel-10	4C-HSDPA

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Annex C - 2: List of Incoming LSs from RAN1#61

Source	Original Tdoc nbr	RAN1 Tdoc nbr	To	Cc	Title	Response to (Ic LS)	Release	WI	Contact
R2	R2-102654	R1-102602	R1		LS on Primary Component Carrier and Semi Persistent Scheduling		Rel-10	LTE_CA-Core	Samsung
R2	R2-102662	R1-102603	R4	R1	LS on pathloss measurements in CA scenarios		Rel-10	LTE_CA-Core	Nokia
R2	R2-102663	R1-102604	R4	R1	LS on Radio Link monitoring for Carrier Aggregation		Rel-10	LTE_CA-Core	Ericsson
R2	R2-102664	R1-102681	R4	R1	UE RF model and capability		Rel-10	LTE_CA-Core	Qualcomm
R4	R4-101490	R1-103051	R1	R2	Reply LS on synchronization requirements between eNB and relay	R1-100832	Rel-10	Relays for LTE	Ericsson
R4	R4-101477	R1-103296	R2	R1	Reply LS on multiple timing advance for inter-band CA	R4-100457	Rel-10	LTE_CA-Core	NTT DoCoMo
R4	R4-101540	R1-103297	R2, R3	R1	Signaling support for positioning reference signal muting		Rel-9	LCS_LTE	Ericsson
R4	R4-101547	R1-103298	R1	R2, R3	Further clarification on downlink positioning reference signal EPRE		Rel-9	LCS_LTE	Ericsson
R4	R4-102236	R1-103331	R1		Reply LS on CSI RS boosting impact on BS transmission distortion	R1-101692 (R4-101853)	Rel-10	LTE_eDL_MIMO-Core	Nokia Siemens Networks, Huawei

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Annex D: List of Approved updated WIDs

None

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Annex E: List of draft TSs/TRs agreed at RAN1 #61

Tdoc Number	Title	Source	Conclusion/Decision

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Annex F: List of actions

1. **Outgoing LS.**

None

2. **CR approval**

[61-20-HSPA]

R1-103407	25.214 CR0602R1 (Rel-7, F) Clarification of the transmit power of S-CPICH for CQI reporting when the UE is configured in MIMO mode	Huawei, Qualcomm Incorporated, InterDigital Communication LLC	(R1-102919)
R1-103408	25.214 CR0603R1 (Rel-8, A) Clarification of the transmit power of S-CPICH for CQI reporting when the UE is configured in MIMO mode	Huawei, Qualcomm Incorporated, InterDigital Communication LLC	(R1-102920)
R1-103409	25.214 CR0604R1 (Rel-9, A) Clarification of the transmit power of S-CPICH for CQI reporting when the UE is configured in MIMO mode	Huawei, Qualcomm Incorporated, InterDigital Communication LLC	(R1-102921)

The CRs are for email approval until May 21st.
Done: These CRs are not agreed as per decision of Mr Chairman dated on 24th May. Proponents are welcomed to present a more detailed document at next meeting outlining the issue and the possible solutions to clarify the UE CQI reporting procedure.

[61-21-HSPA]

R1-103314	25.214 CR0605R2 (Rel-7, F) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA PCH states	Infineon Technologies, Qualcomm Incorporated	(R1-103312)
R1-103315	25.214 CR0606R1 (Rel-8, A) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA PCH states	Infineon Technologies, Qualcomm Incorporated	(R1-103074)
R1-103316	25.214 CR0607R1 (Rel-9, A) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA PCH states	Infineon Technologies, Qualcomm Incorporated	(R1-103075)

The CRs are for email approval until May 25th.
Done: These CRs are not agreed as per decision of Mr Chairman dated on 27th May. Discussion may continue until next meeting.

3. **Text proposal for TS and TR**

[61-22-HSPA]

R1-103317	TP for TR 25.927 on Dormant mode	Huawei, Ericsson	

The TP is for email approval until May 21st.
Done: The TP is agreed as per decision of Mr Chairman dated on 24th May.

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[61-23-HSPA]

R1-103318	TP for TR25.927 on Secondary antenna deactivation	ZTE, Ericsson, China Unicom	

The TP is for email approval until May 21st.
Done: The TP is agreed as per decision of Mr Chairman dated on 24th May.

[61-24-HSPA]

R1-103319	TP for TR25.927 on Power control of common channels	ZTE, Nokia Siemens Networks	

The TP is for email approval until May 21st.
Done: Final TP is agreed in R1-103428 as per decision of Mr Chairman dated on 26th May.

[61-25-HSPA]

R1-103320	TP for TR25.927 on Cell DTX	Alcatel-Lucent, Nokia Siemens Networks	

The TP is for email approval until May 21st.
Done: The TP is agreed as per decision of Mr Chairman dated on 24th May.

[61-26-HSPA]

R1-103424	Compiled TR25.927 v 0.0.3	Vodafone	

The TP is for email approval until May 25th.
Done: The Compiled TR is agreed as per decision of Mr Chairman dated on 28th May

4. Miscellaneous

[61-27-HSPA] (ZTE)
Email discussion until RAN1#61bis on open issues in R1-103142 (Discussion on improvements of distributed antenna for 1.28Mcps TDD).
Done: Status to be checked at RAN1#61bis.

[61-01-LTE-A] Rapporteur Tim Moulsley (Philips).
Email discussion until RAN1#61bis on PUCCH A/N multiplexing for CA.
To cover simulation assumptions and merits / demerits of different schemes, and aim to narrow down the list of schemes under consideration.

R1-103429	ACK/NAK Multiplexing Simulation Assumptions in Rel-10	CATT, LG Electronics, Qualcomm Incorporated, ZTE	

Done: Suggested simulation assumptions as in R1-103429 are noted as the outcome of the email discussion. Status to be checked at RAN1#61bis.

[61-02-LTE-A] Rapporteur Xia Yuan (Huawei).

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Email discussion until RAN1#61bis on CSI-RS pattern.
Pattern proposals to be provided by Wednesday 2nd June. Discussion of patterns can continue afterwards.
Done: Status to be checked at RAN1#61bis.

[61-03-LTE-A] Rapporteur Tetsushi Abe (NTT DoCoMo).
Email discussion on CSI-RS muting until RAN1#61bis.
Done: No conclusion on muting could be achieved. Possible observations of the results of the legacy impact of PDSCH muting and of the results of the step-1 evaluation to be checked at RAN1#61bis.

[61-04-LTE-A] (Huawei)
Email discussion until RAN1#61bis on R1-103406, Way forward for Rel-10 MU-MIMO
Done: Status to be checked at RAN1#61bis.

[61-05-LTE-A] (CATT)
Email discussion until RAN1#61bis on R1-103334, WF on DL MU-MIMO
Done: Status to be checked at RAN1#61bis.

[61-06-LTE-A] Rapporteur Anthony Ekpenyong (TI)
Email discussion until RAN1#61bis on aspects of dynamic aperiodic SRS.
a. Support of other SRS durations
b. Resources used for aperiodic SRS
c. Support of aperiodic triggering by DL grant
d. In case of UL triggering, whether to allow triggering without PUSCH grant
e. Support of group triggering
Done: Status to be checked at RAN1#61bis.

[61-07-LTE-A] (ZTE)
Email approval of R1-103426 (WF on R-PDCCH Interleaving with CRS) until Friday 28th May.
Done: WF in R1-103426 didn't reach consensus as a few companies requested, prior to any agreement, to better define the Mode 1 in R1-103426 and well understand it.

[61-08-LTE-A] (Ericsson)
Email discussion of R1-103401 (Way forward on Un HARQ timeline FDD) until 27th May.
Done: Status to be checked at RAN1#61bis.

[61-09-LTE-A] (CATT)
Email approval of R1-103417 (WF on Identification of Co-channel Problem and Needs in Macro-Pico) until Friday 28th May.
Done: Consensus and draft WF to be checked at RAN1#61 bis.

[61-10-LTE-A]

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R1-103425	Way forward on non contiguous PUSCH Resource allocation	RAN1	(R1-103411)

Done: Final way forward is agreed as R1-103425r1 as per Mr Chairman's decision dated on June 16th .

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Annex G: List of participants at RAN1 #61

Please see excel file attached to this report

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Annex H: TSG RAN WG1 meetings in 2010 - 2011

TITLE	TYPE	DATES	LOCATION	CTRY
3GPPRAN1#61bis	WG	28/06 – 2 Jul 2010	Dresden	GER
3GPPRAN1#62	WG	23 – 27 Aug 2010	Madrid	SP
3GPPRAN1#62bis	WG	11 – 15 Oct 2010	Xi'an	China
3GPPRAN1#63	WG	15 – 19 Nov 2010	TBD	US
3GPPRAN1#63bis	WG	17 – 21 Jan 2011	Dublin	Ireland
3GPPRAN1#64	WG	21 – 25 Feb 2011	Taipei	Taiwan
3GPPRAN1#65	WG	9 – 13 May 2011	TBD	JP
3GPPRAN1#66	WG	22 – 26 Aug 2011	TBD	EU
3GPPRAN1#66bis	WG	10 – 14 Oct 2011	TBD	China
3GPPRAN1#67	WG	14 – 18 Nov 2011	TBD	TBD

MEETING TYPES	
AH = Ad Hoc	CM = Chairmen's meeting
JM = Joint	OR = Ordinary
PM = Preparatory Meeting	RG = Rapporteurs Group
RM = Resolution Meeting	SG = Steering Group
ST = Startup Meeting	TG = Task Group
WG = Working Group	XO = Extraordinary

End of document

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Appendix G

			3GPP TSG RAN Working Group 1 (Layer 1)		
			List of WG1 Temporary Documents		
Available	**Agenda Item**	**Tdoc Number**	**Title**	**Source**	**Conclusion/Decision**
Yes	2	R1-102600	Draft Agenda for RAN1#61 meeting	RAN1 Chairman	Revised
Yes	3	R1-102601	Final report of RAN1#60bis meeting	MCC Support	Approved
Yes	4	R1-102602	LS on Primary Component Carrier and Semi-Persistent Scheduling	RAN2, Samsung	Noted
Yes	4	R1-102603	LS on pathloss measurements in CA scenarios	RAN2, Nokia	Noted
Yes	4	R1-102604	LS on Radio Link monitoring for Carrier Aggregation	RAN2, Ericsson	Noted
Yes	6.2.1	R1-102605	Further discussion on PCFICH for carrier aggregation	Ericsson, ST-Ericsson	Noted
Yes	6.2.2	R1-102606	On PHICH for carrier aggregation	Ericsson, ST-Ericsson	Not treated
Yes	6.2.3.2	R1-102607	Summary of email discussion on blind decodes	Ericsson	Noted
Yes	6.2.3.2	R1-102608	On PDCCH blind decoding	Ericsson, ST-Ericsson	Noted
No	6.2.3.2	R1-102609	On PDCCH search space design for carrier aggregation	Ericsson, ST-Ericsson	Withdrawn
No	6.2.3.3	R1-102610	On configuration and reconfiguration of CIF	Ericsson, ST-Ericsson	Withdrawn
Yes	6.2.4.1	R1-102611	PUCCH design for carrier aggregation	Ericsson, ST-Ericsson	Not treated
Yes	6.2.4.1	R1-102612	Evaluation of PUCCH proposals for carrier aggregation	Ericsson, ST-Ericsson	Noted
Yes	6.2.4.1	R1-102613	On ACK/NACK codebook performance for carrier aggregation	Ericsson, ST-Ericsson	Not treated
Yes	6.2.5.1	R1-102614	Pathloss derivation for carrier aggregation	Ericsson, ST-Ericsson	Not treated
Yes	6.2.5.2	R1-102615	Power headroom reporting for carrier aggregation	Ericsson, ST-Ericsson	Revised
Yes	6.2.5.3	R1-102616	Uplink power limitation handling for carrier aggregation	Ericsson, ST-Ericsson	Noted
No	6.2.6	R1-102617	On PUSCH resource allocation	Ericsson, ST-Ericsson	Withdrawn
Yes	6.8	R1-102618	Considerations on non-CA based heterogeneous deployments	Ericsson, ST-Ericsson	Noted
Yes	6.8	R1-102619	On cell association in hotzone deployments	Ericsson, ST-Ericsson	Not treated
Yes	5.2.1	R1-102620	HS-DPCCH design for 4C-HSDPA	Ericsson, ST-Ericsson	Noted

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Yes	5.2.2	R1-102621	CQI feedback cycle for 4C-HSDPA	Ericsson, ST-Ericsson	Noted
Yes	5.2.2	R1-102622	UE DRX for 4C-HSDPA	Ericsson, ST-Ericsson	Noted
Yes	5.5	R1-102623	Improved Iub/Iur support for NodeB energy saving	Ericsson, ST-Ericsson	Noted
Yes	5.5	R1-102624	On non-backwards compatible solutions for NodeB energy saving	Ericsson, ST-Ericsson	Noted
Yes	5.7	R1-102625	Improved uplink load balancing for MC-HSPA	Ericsson, ST-Ericsson	Noted
Yes	6.3.1.1	R1-102626	Layer mapping for re-transmission	Ericsson, ST-Ericsson	Noted
Yes	6.3.1.4	R1-102627	Discussion on DM RS pattern for extended CP	Ericsson, ST-Ericsson	Not treated
Yes	6.3.2.1	R1-102628	Considerations on CSI-RS design	Ericsson, ST-Ericsson	Noted
Yes	6.3.3.2	R1-102629	On DL Single-Cell MU-MIMO	Ericsson, ST-Ericsson	Not treated
Yes	6.3.4	R1-102630	Refinements of Feedback and Codebook Design	Ericsson, ST-Ericsson	Revised
Yes	6.4.3	R1-102631	Design Principles for UCI on PUSCH	Ericsson, ST-Ericsson	Not treated
Yes	6.5.1.1	R1-102632	Uplink DM-RS Resource Configuration for LTE-Advanced	Ericsson, ST-Ericsson	Not treated
Yes	6.6.1.2	R1-102633	Discussion on Un Starting Times	Ericsson, ST-Ericsson	Noted
Yes	6.6.1.2	R1-102634	Considerations on R-PDCCH design	Ericsson, ST-Ericsson	Not treated
Yes	6.6.1.3	R1-102635	Summary of email discussion on Way Forward on Un HARQ Timeline (FDD)	Ericsson	Noted
Yes	6.6.1.3	R1-102636	Un HARQ timing for FDD	Ericsson, ST-Ericsson	Not treated
Yes	6.6.1.3	R1-102637	Un HARQ timing for TDD	Ericsson, ST-Ericsson	Not treated
Yes	6.6.2	R1-102638	On the standardisation impact of re-using the PDCCH on Un	Ericsson, ST-Ericsson	Not treated
Yes	6.6.2	R1-102639	On the feasibility of single-transceiver relay design	Ericsson, ST-Ericsson	Not treated
Yes	6.2.1	R1-102640	Issues on PCFICH detection in LTE-A	CATT	Not treated
Yes	6.2.2	R1-102641	PHICH collision in LTE-A	CATT	Not treated
Yes	6.2.3.3	R1-102642	Discussion on remaining issues for CIF in LTE-A	CATT	Revised

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Yes	6.2.4.1	R1-102643	UL ACK/NACK Mulitplexing methods for LTE-A	CATT	Noted
Yes	6.2.4.1	R1-102644	DAI Design for LTE-A	CATT	Not treated
Yes	6.2.4.2	R1-102645	PUCCH Format 1/1a/1b Resource Allocation with SORTD	CATT	Not treated
Yes	6.2.4.3	R1-102646	ACK/NAK bundling for FDD with CA	CATT	Not treated
Yes	6.2.4.3	R1-102647	PUCCH resource allocation for CA	CATT	Not treated
Yes	6.2.4.3	R1-102648	CQI feedback for LTE-A	CATT	Not treated
Yes	6.2.5.2	R1-102649	Considerations on power headroom report in LTE-A	CATT	Noted
Yes	6.2.5.3	R1-102650	Considerations on uplink power scaling in LTE-A	CATT	Noted
Yes	6.2.5.4	R1-102651	Considerations on cross-carrier uplink power control with DCI format3/3A in LTE-A	CATT	Noted
Yes	6.2.7	R1-102652	Evaluation of UL CM in LTE-A	CATT	Not treated
Yes	6.3.1.1	R1-102653	Discussion on layer-to-DMRS port mapping	CATT	Noted
Yes	6.3.1.4	R1-102654	Further investigation on DMRS design for extended CP	CATT	Not treated
Yes	6.3.2.1	R1-102655	Further investigation on intra-cell CSIRS	CATT	Noted
No	6.3.2.2	R1-102656	Muting evaluation for CSI-RS measurement	CATT	Withdrawn
Yes	6.3.3.1	R1-102657	Control signaling for DL MIMO	CATT	Not treated
Yes	6.3.4	R1-102658	Performance evaluation of 8Tx precoding codebooks	CATT	Not treated
Yes	6.4.1	R1-102659	Discussion on signaling of UL MIMO	CATT	Noted
Yes	6.4.3	R1-102660	Discussion on UCI transmission in PUSCH	CATT	Not treated
Yes	6.5.2.1	R1-102661	Aperiodic SRS transmission in LTE-A	CATT	Noted
Yes	6.5.2.2	R1-102662	Considerations on increasing SRS multiplexing	CATT, Potevio	Not treated
Yes	6.6.1.1	R1-102663	Remaining Issues on eNB/RN Frame Timing in LTE-A	CATT	Not treated
Yes	6.6.1.1	R1-102664	Transmission timing of R-PDCCH and R-PDSCH	CATT	Noted

Yes	6.6.1.2	R1-102665	Multiplexing of R-PDCCH and R-PDSCH	CATT	Noted
Yes	6.6.1.2	R1-102666	Considerations on Relay Backhaul Control Channels in LTE-A	CATT	Not treated
Yes	6.6.1.2	R1-102667	Design of Relay Reference Signal on Backhaul in LTE-A	CATT	Not treated
Yes	6.6.1.3	R1-102668	Backhaul subframe allocation and HARQ operation	CATT	Not treated
Yes	6.6.2	R1-102669	System Evaluation of Relay Performance	CATT	Not treated
Yes	6.8	R1-102670	Identification of Co-channel Problems with Het-Net Deployments	CATT	Noted
Yes	6.8	R1-102671	Evaluation of R8/9 Power Control and Enhancements for DL Interference Coordination in Macro-Femto	CATT	Not treated
Yes	6.8	R1-102672	Evaluation of R8/9 Techniques and Enhancements for PUCCH Interferernce Coordination in Macro-Pico	CATT	Not treated
Yes	6.8	R1-102673	Assessment of Control Channel Interference Coordination in Co-channel Het-Net	CATT	Noted
Yes	6.8	R1-102674	Fast Fading Modeling Evaluation for Macro-Pico Deployment	CATT	Not treated
Yes	6.8	R1-102675	Uplink Data Channel Interference Mitigation via Power Control	CATT	Not treated
Yes	6.8	R1-102676	DL Interference Mitigation via Direction Information in Het-Net	CATT, ITRI	Not treated
Yes	6.8	R1-102677	Potential Performance of Range Expansion on Rel-8/9 Techniques	Kyocera	Not treated
Yes	6.8	R1-102678	Interference Management for Control Channels in Outdoor Hotzone Scenario	Kyocera	Noted
Yes	6.1	R1-102679	36.213 CR0268 (Rel-9,F) Clarification of PRS EPRE	Ericsson, ST-Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Qualcomm Inc.	Noted - Revised
Yes	6.1	R1-102680	36.214 CR0015 (Rel-9,F) Clarification of RSTD measurement	Ericsson, ST-Ericsson, Huawei	Revised
Yes	4	R1-102681	UE RF model and capability	RAN2, Qualcomm	Noted
Yes	6.5.1.1	R1-102682	UL DMRS design with OCC	CATT	Revised
Yes	5.3	R1-102683	Discussion on DPCH and non-scheduled E-PUCH in LCR TDD MC-HSUPA	CATT	Noted
Yes	5.3	R1-102684	Consideration on E-AGCH type in MC-HSUPA for LCR TDD	CATT	Noted
Yes	5.3	R1-102685	Discussion on UPH for 1.28Mcps TDD MC-HSUPA	CATT	Noted
Yes	5.4	R1-102686	Consideration on special default midamble allocation scheme in MU-MIMO for LCR TDD	CATT, ZTE	Noted
Yes	5.4	R1-102687	Discussion on optimization of E-HICH signature sequence allocation mechanism in MU-MIMO	CATT	Noted

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Yes	4	R1-102688	Suggestion for the response to the RAN4 LS on the UL transmission	LG Electronics	Noted
Yes	6.2.3.2	R1-102689	Structure of PDCCH search space for multiple carrier aggregation	LG Electronics	Not treated
Yes	6.2.3.2	R1-102690	Handling of search space overlap in case of cross-carrier scheduling	LG Electronics	Not treated
Yes	6.2.4.1	R1-102691	ACK/NACK resource allocation in LTE-A	LG Electronics	Revised
Yes	6.2.4.3	R1-102692	UCI piggyback onto PUSCH in for carrier aggregation	LG Electronics	Not treated
Yes	6.2.5.2	R1-102693	Remaining issues about power headroom reporting for LTE-A	LG Electronics	Noted
Yes	6.2.5.3	R1-102694	Remaining issues about power scaling	LG Electronics	Not treated
Yes	6.2.5.5	R1-102695	PUCCH TPC in multiple DL grants	LG Electronics	Not treated
Yes	6.2.6	R1-102696	Evaluation of clustered DFT-S-OFDMA transmission with power backoff	LG Electronics	Not treated
Yes	6.2.6	R1-102697	DCI format to support UL non-contiguous resource allocation	LG Electronics	Not treated
Yes	6.3.2.2	R1-102698	Muting aspects and Intercell CSI-RS design	LG Electronics	Not treated
Yes	6.6.1.1	R1-102699	Starting symbol of R-PDCCH and R-PDSCH	LG Electronics	Noted
Yes	6.6.1.2	R1-102700	Backhaul Control Channel Design in Downlink	LG Electronics	Not treated
Yes	6.6.1.2	R1-102701	Consideration on Relay PUCCH design	LG Electronics	Not treated
Yes	6.6.1.3	R1-102702	Backhaul Subframe Allocation for FDD	LG Electronics	Not treated
Yes	6.6.1.3	R1-102703	Backhaul Subframe Allocation for TDD	LG Electronics	Not treated
Yes	6.8	R1-102704	Coordination for DL control channel in co-channel CSG deployment	LG Electronics	Noted
Yes	6.8	R1-102705	Methods to facilitate the inter-cell coordination in heterogeneous networks	LG Electronics	Not treated
Yes	6.8	R1-102706	Downlink performance over heterogeneous networks	LG Electronics	Not treated
Yes	6.2.1	R1-102707	PDSCH Starting Symbol Indication for Cross-Carrier Scheduling	LG Electronics	Not treated
Yes	6.2.2	R1-102708	PHICH Resource Mapping in Carrier Aggregation	LG Electronics	Not treated
Yes	6.2.3.2	R1-102709	Blind Decoding Reduction Methods	LG Electronics	Noted

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Yes	6.2.3.2	R1-102710	Per-CC UE-specific Search Space Configuration Methods for Cross-carrier Scheduling	LG Electronics	Not treated
Yes	6.2.3.2	R1-102711	Clarification on DRX Details in RAN2 LS for PDCCH Monitoring CC Set	LG Electronics	Not treated
Yes	6.2.3.3	R1-102712	Uncertain Period Handling for CIF Initialization and Release	LG Electronics	Not treated
Yes	6.2.3.3	R1-102713	Uplink CC-to-CI Mapping for Carrier Aggregation	LG Electronics	Not treated
Yes	6.2.3.3	R1-102714	Carrier index (CI) configuration per UE for Carrier Aggregation	LG Electronics	Not treated
Yes	6.2.3.4	R1-102715	Consideration on CI-to-CC Reconfiguration	LG Electronics	Not treated
Yes	6.2.4.1	R1-102716	Performance Comparisons of CA PUCCH Formats	LG Electronics	Noted
Yes	6.2.4.2	R1-102717	Resource Allocation for SORTD	LG Electronics	Not treated
Yes	6.3.1.1	R1-102718	DM-RS Port Mapping for Retransmission	LG Electronics	Noted
Yes	6.3.1.2	R1-102719	PRB Bundling in LTE-Advanced	LG Electronics	Not treated
Yes	6.3.1.3	R1-102720	OCC Mapping for DM RS in LTE-A	LG Electronics	Noted
Yes	6.3.2.1	R1-102721	Remaining Issues on Intra-cell CSI-RS Design	LG Electronics	Noted
Yes	6.3.3.1	R1-102722	Discussion on MU-MIMO Transparency in LTE-A	LG Electronics	Not treated
Yes	6.3.3.2	R1-102723	Discussion on DM-RS Resource Allocation for MU-MIMO in LTE-A	LG Electronics	Not treated
Yes	6.3.4	R1-102724	Consideration on Feedback Design for LTE-A	LG Electronics	Noted
Yes	6.3.5	R1-102725	Remaining Issues on Downlink TxD in LTE-A Subframe	LG Electronics	Not treated
Yes	6.4.1	R1-102726	UL Transmission Mode and Control Signaling in LTE-A	LG Electronics	Noted
Yes	6.4.2	R1-102727	Further Evaluations on Transmit Diversity for PUCCH format 2/2a/2b	LG Electronics	Not treated
Yes	6.4.3	R1-102728	Consideration on UCI and PUSCH Data Multiplexing Scheme in Multi-layer PUSCH Transmission	LG Electronics	Not treated
Yes	6.4.4	R1-102729	PHICH Resource Assignment for UL SU-MIMO in LTE-A	LG Electronics	Noted
Yes	6.5.1.1	R1-102730	Further Considerations on UL DM-RS for LTE-Advanced	LG Electronics	Not treated
Yes	6.5.2.1	R1-102731	Dynamic Aperiodic Sounding for LTE-Advanced	LG Electronics	Noted
Yes	6.2.5.2	R1-102732	Power Headroom Reporting	HTC	Noted

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Yes	6.2.5.4	R1-102733	Cross Carrier Power Control with DCI format 3/3A	HTC	Not treated
No	6.2.5.5	R1-102734	Simultaneous Transmission of SR and ACK/NACK	HTC	Withdrawn
No	6.3.4	R1-102735	Enhanced PMI feedback for Refining MIMO Precoder Codebook	HTC	Withdrawn
No	6.5.2	R1-102736	Consideration on aperiodic SRS	HTC	Withdrawn
Yes	6.8	R1-102737	Performance of ICIC Enhancement by Channel measurement in Relay Stations	HTC	Not treated
Yes	6.2.1	R1-102738	PCFICH for CA operation	Qualcomm Incorporated	Not treated
Yes	6.2.2	R1-102739	PHICH for CA operation	Qualcomm Incorporated	Not treated
Yes	6.2.3.1	R1-102740	Advantages of modified option 1 and relation with search space sharing	Qualcomm Incorporated	Noted
Yes	6.2.3.2	R1-102741	Search space and blind decodes for CA	Qualcomm Incorporated	Noted
Yes	6.2.3.3	R1-102742	Configuring and reconfiguring CIF	Qualcomm Incorporated	Not treated
Yes	6.2.4.1	R1-102743	Link comparison of multi UL-ACK transmission schemes in support of CA	Qualcomm Incorporated	Noted
Yes	6.2.4.2	R1-102744	UL-ACK resource allocation for DL transmission with single CCE and UL TxD	Qualcomm Incorporated	Not treated
Yes	6.2.4.3	R1-102745	CQI for CA	Qualcomm Incorporated	Not treated
Yes	6.2.4.3	R1-102746	UCI transmission for CA	Qualcomm Incorporated	Not treated
Yes	6.2.5.1	R1-102747	Pathloss derivation for open loop correction	Qualcomm Incorporated	Not treated
Yes	6.2.5.2	R1-102748	Reporting of power headroom	Qualcomm Incorporated	Noted
Yes	6.2.5.3	R1-102749	Power scaling in power limited cases	Qualcomm Incorporated	Not treated
Yes	6.2.5.4	R1-102750	Cross-carrier PC with DCI format 3/3A	Qualcomm Incorporated	Noted
Yes	6.2.5.5	R1-102751	Power control for multi-antenna transmission	Qualcomm Incorporated	Not treated
Yes	6.2.6	R1-102752	UL resource allocation for PUSCH	Qualcomm Incorporated	Noted
Yes	6.3.1.1	R1-102753	DM RS layer mapping for re-transmissions	Qualcomm Incorporated	Noted
Yes	6.3.1.2	R1-102754	On PRB bundling support	Qualcomm Incorporated	Not treated

Yes	6.3.1.3	R1-102755	OCC mapping for DL MIMO transmissions	Qualcomm Incorporated	Noted
Yes	6.3.1.4	R1-102756	UE-RS patterns for rank 1-4 and extended CP	Qualcomm Incorporated	Not treated
Yes	6.3.2.1	R1-102757	Further details on CSI-RS	Qualcomm Incorporated	Revised
Yes	6.3.3.1	R1-102758	Transparent vs. non-transparent MU-MIMO operation	Qualcomm Incorporated	Not treated
Yes	6.3.3.2	R1-102759	Spatial multiplexing of UEs in Rel-10	Qualcomm Incorporated	Not treated
Yes	6.4.1	R1-102760	UL trasmission modes and grants for MIMO transmissions	Qualcomm Incorporated	Noted
Yes	6.4.2	R1-102761	Transmit diversity for PUCCH format 2	Qualcomm Incorporated	Not treated
Yes	6.4.3	R1-102762	UCI multiplexing for SU-MIMO transmission	Qualcomm Incorporated	Not treated
Yes	6.4.4	R1-102763	Rank 2 precoder performance for 4Tx	Qualcomm Incorporated	Not treated
Yes	6.5.1.1	R1-102764	Conveying OCC for PUSCH transmissions	Qualcomm Incorporated	Not treated
Yes	6.5.2.1	R1-102765	Further details on aperiodic dynamic SRS	Qualcomm Incorporated	Noted
Yes	6.6.1.1	R1-102766	Access-backhaul timing relationship for UL	Qualcomm Incorporated	Not treated
Yes	6.6.1.2	R1-102767	Starting OFDM symbol for R-PDCCH	Qualcomm Incorporated	Noted
Yes	6.6.1.2	R1-102768	Details on R-PDCCH	Qualcomm Incorporated	Not treated
Yes	6.6.1.2	R1-102769	On data transmission in RB used for R-PDCCH	Qualcomm Incorporated	Not treated
Yes	6.6.1.2	R1-102770	DM-RS for R-PDCCH	Qualcomm Incorporated	Noted
Yes	6.6.1.3	R1-102771	Views on HARQ timeline for relays	Qualcomm Incorporated	Not treated
Yes	6.6.2	R1-102772	Enabling range expansion for Type I relays	Qualcomm Incorporated	Not treated
Yes	6.6.2	R1-102773	DL performance for Type I relays with and without range expansion	Qualcomm Incorporated	Not treated
Yes	6.8	R1-102774	Interference conditions in CSG deployments	Qualcomm Incorporated	Not treated
Yes	6.8	R1-102775	Increasing the footprint of low power nodes for improved performance	Qualcomm Incorporated	Not treated
Yes	6.8	R1-102776	Measurements and feedback extensions for improved operation in HetNets	Qualcomm Incorporated	Not treated

Yes	4	R1-102777	Draft response to LS from RAN4 on simultaneous PUSCH and PUCCH and clustered SC-FDMA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Noted - Revised
Yes	5.2.1	R1-102778	HS-DPCCH channelisation codes and information mapping	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Not treated
Yes	5.5	R1-102779	Text Proposal to TR25.927 on NodeB DTX	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Noted
Yes	6.2.2	R1-102780	PHICH resource allocation in LTE-A	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Not treated
Yes	6.2.4.1	R1-102781	PUCCH A/N channel design in LTE-A	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Not treated
Yes	6.2.5.1	R1-102782	Pathloss offset signalling for non-contiguous carrier aggregation	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Not treated
Yes	6.2.5.2	R1-102783	Power headroom reporting for carrier aggregation	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Noted
Yes	6.2.5.3	R1-102784	Power scaling method for maximum power	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Noted
Yes	6.2.5.4	R1-102785	Way Forward on cross-carrier power control	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Noted
Yes	6.2.6	R1-102786	Non-contiguous PUSCH resource allocation signalling	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Not treated
Yes	6.3.1.2	R1-102787	Coherent Time-Frequency Precoding for the PRB bundling	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Not treated
Yes	6.3.1.2	R1-102788	Discussion on Wide Band PRB bundling	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Not treated
Yes	6.3.2.1	R1-102789	CSI-RS design	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Noted
Yes	6.3.3.1	R1-102790	DCI formats for MU-MIMO	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Not treated
Yes	6.3.4	R1-102791	Further development of two-stage feedback framework for Rel-10	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Noted
Yes	6.3.4	R1-102792	Further evaluation of differential feedback in the context of the Rel-10 two-stage explicit feedback framework	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Not treated
Yes	6.3.4	R1-102793	Further analysis of companion feedback performance and feedback signalling overhead reduction	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Not treated
Yes	6.4.1	R1-102794	UL transmission modes for PUSCH	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Noted
Yes	6.4.3	R1-102795	UCI multiplexing on PUSCH in case of SU-MIMO	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Not treated
Yes	6.4.4	R1-102796	Cyclic shift mapping of PHICH resources for UL MIMO	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Noted
Yes	6.5.2.1	R1-102797	Triggering of dynamic aperiodic SRS	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Noted
Yes	6.5.2.2	R1-102798	Summary of SRS enhancements	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Not treated

Yes	6.6.1.1	R1-102799	UL timing for TDD relay	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Not treated
Yes	6.6.1.2	R1-102800	R-PDCCH Multiplexing	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Not treated
Yes	6.6.1.2	R1-102801	Need for R-PHICH	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Not treated
Yes	6.6.1.3	R1-102802	HARQ timing for type 1 relay	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Withdrawn
Yes	6.7	R1-102803	UTDOA Modeling and Performance	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Noted
Yes	6.8	R1-102804	UE Control Channel Outage Mitigation	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Noted
Yes	6.8	R1-102805	Control Channel Performance for Hetnet	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Noted
Yes	6.8	R1-102806	HetNet Rel-8/9 Data Channel Performance	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Not treated
Yes	6.8	R1-102807	Consideration on enhancements of Rel. 8 CQI feedback	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Not treated
Yes	6.8	R1-102808	DL Pico/Macro Het Net Performance: Cell Selection	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Not treated
Yes	6.8	R1-102809	Cell Association Enhancements for HetNet	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Revised
Yes	6.8	R1-102810	Fairness Consideration for Cell Association Enhancements	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Not treated
Yes	6.2.3.2	R1-102811	PDCCH Search Space Design	Intel Corporation (UK) Ltd	Not treated
Yes	6.2.2	R1-102812	PHICH collision handling for carrier aggregation	Intel Corporation (UK) Ltd	Not treated
Yes	6.3.4	R1-102813	Enhanced MIMO feedbacks for LTE-A	Intel Corporation (UK) Ltd	Noted
Yes	6.8	R1-102814	Non-CA based PDCCH Interference Mitigation in LTE-A	Intel Corporation (UK) Ltd	Noted
Yes	6.2.1	R1-102815	Views on PCFICH detection in LTE-A	Texas Instruments	Not treated
No	6.2.4.1	R1-102816	Comparison of ACK/NACK transmission schemes on PUCCH for CA	Texas Instruments	Withdrawn
Yes	6.2.5.2	R1-102817	On Power Headroom Reporting for Carrier Aggregation	Texas Instruments	Noted
Yes	6.2.5.4	R1-102818	Cross-carrier power control using DCI Formats 3/3A	Texas Instruments	Noted
Yes	6.3.2.2	R1-102819	PDSCH muting for inter-cell CSI estimation: Rel-8 UE performance	Texas Instruments	Not treated
Yes	6.3.2.2	R1-102820	PDSCH muting: N-MSE for inter-cell CSI estimation	Texas Instruments	Not treated

Yes	6.3.3.1	R1-102821	Views on MU-MIMO transparency	Texas Instruments	Not treated
Yes	6.3.3.2	R1-102822	On DL MU-MIMO dimensioning	Texas Instruments	Not treated
Yes	6.3.4	R1-102823	8Tx codebook design	Texas Instruments	Not treated
Yes	6.3.4	R1-102824	Multiple PMI feedback for dynamic SU/MU switching	Texas Instruments	Not treated
Yes	6.3.5	R1-102825	DL MIMO transmission modes in LTE-A	Texas Instruments	Not treated
Yes	6.4.1	R1-102826	Transmission Modes and Signaling for UL MIMO	Texas Instruments	Noted
Yes	6.4.3	R1-102827	Data and Control Multiplexing for UL Multi-Antenna Transmission	Texas Instruments	Not treated
Yes	6.4.4	R1-102828	Specifying Basic Building Blocks of UL Multi-Antenna Transmission	Texas Instruments	Not treated
Yes	6.4.4	R1-102829	Further details on PHICH for UL SU-MIMO	Texas Instruments	Noted
Yes	6.5.2.1	R1-102830	Signaling considerations for dynamic aperiodic SRS	Texas Instruments	Noted
Yes	6.8	R1-102831	Rel-8/9 compatible PDCCH interference mitigation schemes for het-nets	Texas Instruments	Noted
Yes	6.8	R1-102832	Outdoor hotzone cell performance: A cell selection analysis	Texas Instruments	Not treated
Yes	6.2.1	R1-102833	On the PCFICH detection in cross-carrier scheduling	Pantech	Revised
Yes	6.2.1	R1-102834	On the cross-carrier CFI signaling by PDCCH	Pantech	Revised
Yes	6.2.6	R1-102835	Further details on the non-contiguous UL RA scheme with limited clusters	Pantech	Not treated
Yes	6.3.3.1	R1-102836	DMRS indicator of DL signalling for Non-transparent MU-MIMO	Pantech	Not treated
Yes	6.3.4	R1-102837	CQI feedback for Downlink MU-MIMO	Pantech	Not treated
Yes	6.3.4	R1-102838	Rel-10 codebook design issues for downlink transmission	Pantech	Revised
Yes	6.5.1.1	R1-102839	CS and OCC for Uplink DM-RS Design in LTE-A	Pantech	Not treated
Yes	6.5.2.1	R1-102840	Further Consideration on Aperiodic SRS solutions	Pantech	Not treated
Yes	6.5.2.1	R1-102841	Further Consideration on Aperodic SRS signaling	Pantech	Noted
Yes	5.4	R1-102842	Analysis on the basic issues of MU-MIMO for LCR TDD	New Postcom	Withdrawn
No	6.2.2	R1-102843	PHICH Assignment for Uplink 2CW	New Postcom	Withdrawn
Yes	6.8	R1-102844	Hybrid resource partitioning method in the Macro-Pico Co-channel deployment	New Postcom	Not treated
No	6.8	R1-102845	PUCCH Interference mitigation in heterogeneous networks	New Postcom	Withdrawn

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Yes	6.5.2.1	R1-102846	Views on UL-Grant Based Aperiodic SRS	MediaTek	Noted
Yes	6.8	R1-102847	Discussion on inter-cell interference between PRACH and PUCCH/PUSCH in Heterogeneous Networks	MediaTek	Not treated
Yes	6.2.5.4	R1-102848	Views on DCI format 3/3A Design in Carrier Aggregation	MediaTek	Not treated
Yes	6.2.6	R1-102849	Discussion on resource allocation of multi-cluster PUSCH	MediaTek	Noted
Yes	6.2.6	R1-102850	Signalling of multi-cluster PUSCH resource allocation	MediaTek	Not treated
Yes	6.2.1	R1-102851	PCFICH in cross carrier operation	Panasonic	Not treated
Yes	6.2.3.2	R1-102852	Search space for cross carrier scheduling	Panasonic	Not treated
Yes	6.2.3.3	R1-102853	CIF reconfiguration issue	Panasonic	Not treated
Yes	6.2.4.1	R1-102854	Support of multiple ACK/NACK transmission schemes	Panasonic	Not treated
Yes	6.2.4.1	R1-102855	ACK/NACK transmission schemes for carrier aggregation	Panasonic	Not treated
Yes	6.2.4.1	R1-102856	Support of UL ACK/NACK channel selection for carrier aggregation	Panasonic	Not treated
Yes	6.2.4.1	R1-102857	Support of UL ACK/NACK bundling across CC for carrier aggregation	Panasonic	Not treated
No	6.2.4.1	R1-102858	UL ACK/NACK transmission on large payload size format	Panasonic	Withdrawn
Yes	6.2.4.2	R1-102859	SORTD configurations for ACK/NACK information and SRI	Panasonic	Not treated
Yes	6.2.4.2	R1-102860	PUCCH resource indication for SORTD and carrier aggregation	Panasonic	Not treated
Yes	6.2.4.3	R1-102861	Periodic CQI Reporting for Carrier Aggregation	Panasonic	Not treated
Yes	6.2.4.3	R1-102862	Simultaneous transmission of Scheduling request indicator and ACK/NACK information for LTE-Advanced	Panasonic	Not treated
Yes	6.2.4.3	R1-102863	Discussion on various UL transmission configurations	Panasonic	Not treated
Yes	6.2.5.4	R1-102864	DCI format 3/3A for cross carrier operation	Panasonic	Noted
Yes	6.2.6	R1-102865	Additional system performance evaluation for UL non-contiguous resource allocation	Panasonic	Not treated
Yes	6.2.6	R1-102866	Signaling for UL non-contiguous resource allocation	Panasonic	Noted
Yes	6.2.6	R1-102867	Discussion on inter-modulation issue for clustered PUSCH transmission	Panasonic	Not treated

Yes	6.2.7	R1-102868	Aperiodic CQI Reporting for Carrier Aggregation	Panasonic	Not treated
Yes	6.3.1.3	R1-102869	OCC mapping for DM-RS rank 5~8	Panasonic	Noted
Yes	6.3.2.1	R1-102870	Views on Intra-cell CSI-RS design	Panasonic	Noted
Yes	6.3.2.2	R1-102871	Link level analysis on RE muting for CSI-RS design: Step1 evaluation	Panasonic	Not treated
Yes	6.3.2.2	R1-102872	Link level analysis on RE muting for CSI-RS design: Step2 evaluation	Panasonic	Revised
Yes	6.3.2.1	R1-102873	Inter-cell CSI-RS design	Panasonic	Noted
Yes	6.3.3.2	R1-102874	DMRS port indication with MU-MIMO considerations	Panasonic	Not treated
Yes	6.3.4	R1-102875	Further considerations on 8Tx codebook design	Panasonic	Not treated
Yes	6.4.3	R1-102876	UCI multiplexing on PUSCH with MIMO transmission	Panasonic	Not treated
Yes	6.5.1.1	R1-102877	OCC and CS for UL DMRS in SU/MU-MIMO	Panasonic	Not treated
Yes	6.5.1.2	R1-102878	CM reduction for UL RS on multiple component carriers	Panasonic	Not treated
Yes	6.5.2.1	R1-102879	Discussion on dynamic aperiodic SRS for LTE-Advanced	Panasonic	Noted
Yes	6.6.1.1	R1-102880	DL backhaul starting timing of R-PDCCH and R-PDSCH	Panasonic	Noted
Yes	6.6.1.2	R1-102881	R-PDCCH placement	Panasonic	Not treated
Yes	6.6.1.2	R1-102882	DCI formats for R-PDCCH	Panasonic	Not treated
Yes	6.6.1.3	R1-102883	UL/DL HARQ timing for backhaul	Panasonic	Not treated
Yes	6.6.1.3	R1-102884	Comparison of UL/DL HARQ for backhaul	Panasonic	Not treated
Yes	6.8	R1-102885	Possibility of UE side ICI cancellation in Hetnet	Panasonic	Not treated
No	6.3.5	R1-102886	Enhanced CoMP Based on Spatial Interference Alignment for LTE-Advanced Network	WOASiS	Withdrawn
Yes	5.2.1	R1-102887	Some Aspects of HS-DPCCH Design for 4C-HSDPA with MIMO Configuration	ZTE	Noted
Yes	5.5	R1-102888	TP to TR25.927: Dynamic switch on/off secondary antenna in MIMO system	ZTE	Revised
Yes	6.2.1	R1-102889	PCFICH detection error cases and handling	ZTE	Not treated

Yes	6.2.2	R1-102890	Views for PHICH collision issue	ZTE	Not treated
Yes	6.2.3.3	R1-102891	Remaining issues on carrier indicator field	ZTE	Revised
Yes	6.2.3.2	R1-102892	PDCCH blind decoding and search space for carrier aggregation of LTE-A	ZTE	Not treated
Yes	4	R1-102893	On LS for the CIF application cases in SPS scheduling	ZTE	Revised
Yes	6.8	R1-102894	Control and data channel performance evaluations for co-channel deployment with MeNBs and outdoor Picos	ZTE	Noted
Yes	6.3.1.1	R1-102895	Views on layer to DMRS port mapping for retransmission	ZTE	Noted
Yes	6.3.1.2	R1-102896	Views on PRB bundling	ZTE	Not treated
Yes	6.3.1.3	R1-102897	OCC allocation and OCC mapping	ZTE	Noted
Yes	6.3.1.4	R1-102898	DMRS pattern design under extended CP	ZTE	Not treated
Yes	6.3.2.1	R1-102899	CSI-RS pattern and configuration	ZTE	Revised
Yes	6.3.2.2	R1-102900	CSI-RS muting evaluation	ZTE	Not treated
Yes	6.3.3.1	R1-102901	Consideration on downlink control signalling design for MU-MIMO transparency	ZTE	Not treated
Yes	6.3.3.2	R1-102902	Performance study of MU-MIMO with quasi-orthogonal DMRS and orthogonal DMRS	ZTE	Not treated
Yes	6.3.3.2	R1-102903	Consideration on downlink control signalling design for DMRS port indication with different MU dimensions	ZTE	Not treated
Yes	6.3.4	R1-102904	Two-Level Codebook design for MU-MIMO enhancement	ZTE	Noted
Yes	6.3.4	R1-102905	Discussion on Two-component Feedback Framework for 8Tx	ZTE	Revised
Yes	6.3.4	R1-102906	Performance Evaluation of LTE-A DL MIMO with 8Tx codebook	ZTE	Revised
Yes	6.2.4.1	R1-102907	Evaluation of AN multiplexing for Carrier Aggregation	ZTE	Noted
Yes	6.2.5.2	R1-102908	Power Headroom Reporting for Carrier Aggregation in LTE-Advanced	ZTE	Not treated
Yes	6.2.5.4	R1-102909	Issues on UL TPC Command in LTE-Advanced	ZTE	Not treated
Yes	6.4.3	R1-102910	UCI Multiplexing on PUSCH with MIMO Transmission	ZTE	Not treated
Yes	6.4.1	R1-102911	UL transmission Modes and Signalling Requirement for LTE-A	ZTE	Not treated
Yes	6.4.4	R1-102912	Consideration on ACK transmission for multi-antenna PUCCH Format 2b in LTE	ZTE	Not treated

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Yes	6.4.2	R1-102913	Multi-antenna transmission scheme for PUCCH format 2	ZTE	Not treated
Yes	6.6.1.1	R1-102914	Starting symbols for R-PDCCH and R-PDSCH	ZTE	Noted
Yes	6.6.1.2	R1-102915	The mapping schemes of R-PDCCH	ZTE	Not treated
Yes	6.6.1.3	R1-102916	Backhaul UL Subframe Allocation in TDD LTE-A Relay	ZTE	Not treated
Yes	6.6.1.1	R1-102917	Timing between RN and eNB in TDD	ZTE	Not treated
Yes	6.6.1.1	R1-102918	Simulation study on downlink RN to RN interference	ZTE	Not treated
Yes	5.1.1	R1-102919	25.214 CR0602 (Rel-7, F) Clarification of the transmit power of S-CPICH for CQI reporting when the UE is configured in	Huawei	Noted - Revised
Yes	5.1.1	R1-102920	25.214 CR0603 (Rel-8, A) Clarification of the transmit power of S-CPICH for CQI reporting when the UE is configured in	Huawei	Noted - Revised
Yes	5.1.1	R1-102921	25.214 CR0604 (Rel-9, A) Clarification of the transmit power of S-CPICH for CQI reporting when the UE is configured in	Huawei	Noted - Revised
Yes	5.2.1	R1-102922	Considerations on HS-DPCCH design for 4C-HSDPA	Huawei	Noted
Yes	5.2.1	R1-102923	HS-DPCCH design for 3-carrier without MIMO	Huawei	Revised
Yes	5.2.1	R1-102924	HS-DPCCH design for 4-carrier without MIMO	Huawei	Not treated
Yes	5.2.1	R1-102925	Discussion on grouping of DL carriers for 4C-HSDPA	Huawei	Noted
Yes	5.2.2	R1-102926	CQI configuration for 4C-HSDPA	Huawei	Noted
Yes	5.2.2	R1-102927	Timer based implicit deactivation for Dual Band 4C-HSDPA	Huawei	Noted
No	5.2.2	R1-102928	UE categories for 4C-HSDPA	Huawei	Withdrawn
Yes	5.5	R1-102929	Further discussion on gradually cell switch off&on method	Huawei	Noted
Yes	5.5	R1-102930	TP to TR 25.927 "Solutions for energy saving within UTRA Node B"	Huawei	Noted
Yes	5.7	R1-102931	Concept of UL Closed Loop Transmit Diversity	Huawei	Noted
Yes	6.2.1	R1-102932	PCFICH Issues with Cross-Component Carrier Scheduling	Nokia Siemens Networks, Nokia	Not treated
Yes	6.2.1	R1-102933	Summary of email discussion on PCFICH	Nokia	Noted
Yes	6.2.2	R1-102934	PHICH mapping for SPS	Nokia, Nokia Siemens Networks	Not treated
Yes	6.2.3.2	R1-102935	Handling DCI formats and blind decoding in LTE-Advanced	Nokia, Nokia Siemens Networks	Noted
Yes	6.2.3.2	R1-102936	Considerations on alternative ways of implementing DCI formats for LTE-Advanced	Nokia, Nokia Siemens Networks	Not treated
Yes	6.2.3.2	R1-102937	On UE specific search space definitions for cross-CC scheduling for carrier aggregation	Nokia, Nokia Siemens Networks	Not treated
Yes	6.2.3.3	R1-102938	Reconfigurations and search space overlap conflicts	Nokia Siemens Networks, Nokia	Not treated
Yes	6.2.4.1	R1-102939	UL ACK/NAK Feedback for Power-Limited UE in LTE-A TDD	Nokia, Nokia Siemens Networks	Not treated

Yes	6.2.4.1	R1-102940	UL ACK/NAK Feedback in LTE-A TDD	Nokia, Nokia Siemens Networks	Not treated
Yes	6.2.4.1	R1-102941	Evaluation of UL ACK/NAK Bundling Ways in LTE-A TDD	Nokia, Nokia Siemens Networks	Not treated
Yes	6.2.4.1	R1-102942	On the need for cross-carrier A/N bundling	Nokia Siemens Networks, Nokia	Not treated
Yes	6.2.4.1	R1-102943	On the PUCCH Resource Allocation and A/N Codebook Size for Carrier Aggregation	Nokia Siemens Networks, Nokia	Not treated
Yes	6.2.4.2	R1-102944	SORTD resource allocation	Nokia Siemens Networks, Nokia	Not treated
Yes	6.2.4.3	R1-102945	On the PUCCH Multiplexing Combinations for CA	Nokia Siemens Networks, Nokia	Not treated
Yes	6.2.5.2	R1-102946	Power headroom reporting for uplink carrier aggregation	Nokia Siemens Networks, Nokia	Noted
Yes	6.2.5.3	R1-102947	Power reduction rule for uplink carrier aggregation	Nokia Siemens Networks, Nokia	Noted
Yes	6.2.5.4	R1-102948	Cross-CC Scheduling for DCI Format 3/3A in LTE-Advanced	Nokia, Nokia Siemens Networks	Noted
Yes	6.2.6	R1-102949	Performance evaluation and RA design for clustered allocation	Nokia Siemens Networks, Nokia	Noted
Yes	6.2.7	R1-102950	Output power back-off aspects for clustered PUSCH	Nokia Siemens Networks, Nokia	Not treated
Yes	6.2.7	R1-102951	Autonomous Base Component Carrier selection results in dense urban area scenario	Nokia Siemens Networks, Nokia	Not treated
Yes	6.2.7	R1-102952	CSI reporting for Carrier Aggregation	Nokia Siemens Networks, Nokia	Not treated
Yes	6.3.1.1	R1-102953	DM-RS details for retransmission	Nokia, Nokia Siemens Networks	Noted
Yes	6.3.1.4	R1-102954	DM-RS views on extended CP	Nokia, Nokia Siemens Networks	Revised
Yes	6.3.2.1	R1-102955	Achievable CQI measurement accuracy over CSI-RS	Nokia, Nokia Siemens Networks	Not treated
Yes	6.3.2.1	R1-102956	Intra-cell CSI-RS design	Nokia, Nokia Siemens Networks	Noted
Yes	6.3.2.2	R1-102957	Stage 1 simulation study of RE muting for inter-cell CSI-RS	Nokia, Nokia Siemens Networks	Not treated
Yes	6.3.3.2	R1-102958	On the downlink DM-RS support for MU-MIMO in LTE Rel-10	Nokia, Nokia Siemens Networks	Not treated
Yes	6.3.4	R1-102959	Feedback design and signaling considerations for double codebook operation	Nokia, Nokia Siemens Networks	Noted
Yes	6.4.1	R1-102960	PUSCH SU-MIMO transmission modes	Nokia Siemens Networks, Nokia	Not treated
Yes	6.4.2	R1-102961	On transmission diversity for PUCCH Format 2/2a/2b	Nokia Siemens Networks, Nokia	Not treated

Yes	6.4.3	R1-102962	Performance evaluation of UCI multiplexing schemes on PUSCH in case of SU-MIMO	Nokia Siemens Networks, Nokia	Not treated
Yes	6.4.4	R1-102963	Performance evaluation on UL SU-MIMO channel interleaver	Nokia Siemens Networks, Nokia	Not treated
Yes	6.5.1.1	R1-102964	OCC configuration and sequence group hopping	Nokia Siemens Networks, Nokia	Not treated
Yes	6.5.1.2	R1-102965	Cyclic shift configuration with SU-MIMO	Nokia Siemens Networks, Nokia	Not treated
Yes	6.5.2.1	R1-102966	Dynamic aperiodic SRS	Nokia Siemens Networks, Nokia	Noted
Yes	6.5.2.2	R1-102967	Channel sounding enhancements for LTE Advanced uplink	Nokia Siemens Networks, Nokia	Not treated
Yes	6.6.1.2	R1-102968	Discussions on Backhaul Reference Signal Design	Nokia, Nokia Siemens Networks	Noted
Yes	6.6.1.2	R1-102969	On DL Backhaul Control Channel Design Aspects	Nokia Siemens Networks, Nokia	Noted
Yes	6.6.1.3	R1-102970	Issues on HARQ over Un Interface for FDD In-band Relay	Nokia, Nokia Siemens Networks	Not treated
Yes	6.6.1.3	R1-102971	Discussion on Symmetry and Asymmetry SF Allocation for Backhaul	Nokia, Nokia Siemens Networks	Not treated
Yes	6.6.2	R1-102972	Type-1 Relay Performance for Uplink	Nokia, Nokia Siemens Networks	Not treated
Yes	6.8	R1-102973	Simulation results for Mobility in Heterogeneous Networks	Nokia, Nokia Siemens Networks	Not treated
Yes	6.8	R1-102974	HetNet interference management needs and candidate solutions	Nokia Siemens Networks, Nokia	Noted
Yes	6.8	R1-102975	Downlink CCH performance aspects for macro and HeNB deployment in dense urban scenario	Nokia Siemens Networks, Nokia	Not treated
Yes	6.8	R1-102976	Performance and interference aspects of macro with outdoor pico hotspot	Nokia Siemens Networks, Nokia	Not treated
Yes	6.8	R1-102977	HeNB power control	Nokia Siemens Networks, Nokia	Not treated
Yes	6.5.2.1	R1-102978	View on Detail Design of Dynamic Aperiodic SRS	KDDI	Noted
Yes	6.2.1	R1-102979	Indication of starting symbol in PDSCH in a cross-scheduled carrier	HTC	Not treated
Yes	6.2.3.3	R1-102980	CIF configuration and reconfiguration	HTC	Not treated
Yes	6.8	R1-102981	Considerations on PBCH ICIC for CSG HeNB	ITRI	Not treated
Yes	6.2.3.3	R1-102982	Review of CIF Reconfiguration	Philips	Revised
Yes	6.3.4	R1-102983	Deriving explicit channel information from PMI	Philips	Not treated
Yes	6.8	R1-102984	Mitigation of control channel interference	Philips	Noted

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Yes	6.8	R1-102985	UE assumptions on interference	Philips	Not treated
Yes	6.4.2	R1-102986	Evaluations on Transmit Diversity for PUCCH format 2	Potevio	Not treated
Yes	6.8	R1-102987	Interference management via power control in the HetNets	Potevio	Not treated
Yes	6.3.3.2	R1-102988	Downlink signalling support for MU-MIMO in LTE-A	Potevio	Not treated
Yes	6.2.3.2	R1-102989	Discussion on shared search spaces in carrier aggregation	Potevio	Not treated
Yes	6.2.3.2	R1-102990	Search spaces design in carrier aggregation	Potevio	Not treated
Yes	6.2.5.4	R1-102991	Discussion about TPC transmission for CA in LTE-A	Potevio	Not treated
Yes	6.6.1.1	R1-102992	UL timing synchronization for TDD relay	Potevio	Not treated
Yes	6.2.2	R1-102993	PHICH Resource Indexing with UL CA	Samsung	Not treated
Yes	6.2.3.1	R1-102994	Linkage between PDCCH and PDSCH/PUSCH with Cross-Carrier Scheduling	Samsung	Noted
Yes	6.2.3.1	R1-102995	Handling of linkage between UL CC and deactivated DL CC	Samsung	Not treated
Yes	6.2.3.2	R1-102996	PDCCH Search Space Design for CA	Samsung	Not treated
Yes	6.2.3.3	R1-102997	Confusion Between DCI Formats for Different CCs, Tx Modes and Bandwidths	Samsung	Not treated
Yes	6.2.3.3	R1-102998	CIF Configuration	Samsung	Not treated
Yes	6.2.3.4	R1-102999	DAI design for LTE-A TDD	Samsung	Not treated
Yes	6.2.4.1	R1-103000	Discussion on ACK/NACK transmission method for LTE-A TDD	Samsung	Not treated
Yes	6.2.4.1	R1-103001	PUCCH HARQ-ACK Signal Transmission with DL CA in Rel-10 FDD	Samsung	Noted
Yes	6.2.4.1	R1-103002	UL HARQ-ACK Resource Indexing Mapping with DL CA	Samsung	Not treated
Yes	6.2.4.2	R1-103003	Transmit Diversity for PUCCH Format 1/1a/1b	Samsung	Not treated
Yes	6.2.4.3	R1-103004	Concurrent transmission of SR indicator and ACK/NACK information for LTE-A	Samsung	Not treated
Yes	6.2.4.3	R1-103005	CSI Feedback Signaling in Rel-10	Samsung	Not treated
Yes	6.2.5.1	R1-103006	Path-Loss Derivation for CA	Samsung	Not treated

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Yes	6.2.5.2	R1-103007	PUSCH/PUCCH power headroom reporting	Samsung	Not treated
Yes	6.2.5.3	R1-103008	Power Scaling for UL TPC with CA	Samsung	Not treated
Yes	6.2.5.4	R1-103009	Cross-carrier UL PC for LTE-A	Samsung	Not treated
Yes	6.2.5.5	R1-103010	UL SU-MIMO power control	Samsung	Not treated
Yes	6.2.6	R1-103011	Multi-Cluster PUSCH Transmissions – Performance Overview	Samsung	Not treated
Yes	6.2.6	R1-103012	DCI Format for Multi-Cluster PUSCH Transmissions	Samsung	Noted
Yes	6.2.7	R1-103013	CQI discrepancy between PDCCH and PDSCH region	Samsung	Not treated
Yes	6.2.7	R1-103014	Aperiodic CQI activation in CA	Samsung	Not treated
Yes	6.3.1.2	R1-103015	Email discussion summary of PRB bundling	Samsung	Noted
Yes	6.3.1.2	R1-103016	PRB bundling for Rel-10	Samsung	Not treated
Yes	6.3.1.3	R1-103017	Discussion on DMRS Power Balancing across OFDM symbols	Samsung	Noted
Yes	6.3.1.4	R1-103018	DM RS for extended CP	Samsung	Revised
No	6.3.2.1	R1-103019	Discussion on reuse factor for CSI-RS	Samsung	Withdrawn
Yes	6.3.2.1	R1-103020	Discussion on intra-cell CSI-RS design	Samsung	Noted
Yes	6.3.3.1	R1-103021	Discussions on DL control signalling for LTE-A MU-MIMO	Samsung	Not treated
Yes	6.3.3.1	R1-103022	Performance evaluation of transparent vs. non-transparent MU-MIMO	Samsung	Not treated
Yes	6.3.3.1	R1-103023	Discussion on PDCCH capacity considering MU-MIMO	Samsung	Not treated
Yes	6.3.4	R1-103024	Multi-component feedback in support of dynamic switching between SU-MIMO and MU-MIMO in LTE-A	Samsung	Not treated
Yes	6.3.4	R1-103025	Best companion CQI for MU-MIMO enhancements	Samsung	Not treated
Yes	6.3.4	R1-103026	Views on the feedback framework for Rel. 10	Samsung	Revised
Yes	6.3.4	R1-103027	Performancce evaluations of Rel. 10 feedback framework	Samsung	Revised
Yes	6.3.4	R1-103028	Control signaling to support feedback enhancements in Rel. 10	Samsung	Revised

Yes	6.3.4	R1-103029	Study on periodic feedback of PMI/CQI responding to CSI-RS	Samsung	Not treated
Yes	6.3.5	R1-103030	Discussion on CSI-RS based CQI Reporting for Rel-10	Samsung	Not treated
Yes	6.3.5	R1-103031	TX diversity on MBSFN subframe	Samsung	Not treated
Yes	6.3.5	R1-103032	DL transmission modes for Rel-10	Samsung	Not treated
Yes	6.4.1	R1-103033	Further Discussions on UL MIMO signaling requirements	Samsung	Revised
Yes	6.4.1	R1-103034	PMI signaling in DCI format for UL MIMO	Samsung	Not treated
Yes	6.4.1	R1-103035	UL SU-MIMO precoding in PHICH-triggered retransmissions	Samsung	Noted
Yes	6.4.2	R1-103036	Transmit Diversity for PUCCH Formats 2/2a/2b	Samsung	Not treated
Yes	6.4.3	R1-103037	Further Disucssions on Data and Control Multiplexing in UL MIMO Transmissions	Samsung	Not treated
Yes	6.5.1.1	R1-103038	UL DMRS Aspects in Rel-10	Samsung	Not treated
Yes	6.5.2.1	R1-103039	Resources for Dynamic SRS Activation and SRS Multiplexing in Rel-10	Samsung	Noted
Yes	6.6.1.2	R1-103040	R-PDCCH search space design	Samsung	Not treated
Yes	6.6.1.2	R1-103041	R-PDCCH multiplexing	Samsung	Not treated
Yes	6.6.1.2	R1-103042	R-PDCCH CCE mapping	Samsung	Not treated
Yes	6.6.1.3	R1-103043	Backhaul subframe allocation and HARQ timing for TDD	Samsung	Not treated
Yes	6.6.1.3	R1-103044	HARQ operation in Un link	Samsung	Not treated
Yes	6.6.2	R1-103045	Inter-cell CSI-RS design considering Type 1 Relay	Samsung	Not treated
Yes	6.8	R1-103046	PDCCH Extension for ICIC and Capacity	Samsung	Noted
Yes	6.8	R1-103047	ICIC Support for SRS Transmissions	Samsung	Not treated
Yes	6.8	R1-103048	Static/Dynamic Home eNB ICIC function	Samsung	Not treated
Yes	6.8	R1-103049	Performance evaluation of Home eNB ICIC function based on time/frequency domain silencing	Samsung	Not treated
Yes	6.8	R1-103050	Quality Feedback of PDCCH region for Heterogeneous Network	Samsung	Not treated

Yes	4	R1-103051	Reply LS on synchronization requirements between eNB and relay	RAN4, Ericsson	Noted
Yes	6.2.1	R1-103052	Cross-carrier CFI signalling	NEC Group	Not treated
Yes	6.2.6	R1-103053	DCI format design for UL non-contiguous resource allocation with single antenna transmission	NEC Group	Revised
Yes	6.2.6	R1-103054	Consideration on the required maximum power back-off for clustered DFT-S-OFDM with adaptive SRS transmission	NEC Group	Not treated
Yes	6.3.3.1	R1-103055	Views on MU-MIMO transparency	NEC Group	Not treated
Yes	6.3.3.2	R1-103056	On the use of DM RS ports / scrambling sequences for MU-MIMO	NEC Group	Not treated
Yes	6.3.4	R1-103057	MU-MIMO: CQI Computation and PMI Selection	NEC Group	Not treated
Yes	6.5.1.2	R1-103058	CM reduction of UL RS for carrier aggregation in LTE-A	NEC Group, NTT DOCOMO	Not treated
Yes	6.8	R1-103059	Classification of eICIC candidate schemes	NEC Group	Noted
Yes	6.2.2	R1-103060	Views on LTE-A PHICH collision handling	NEC Group	Not treated
Yes	6.6.1.2	R1-103061	Further details of the R-PDCCH and R-PDSCH/PDSCH multiplexing	NEC Group	Not treated
Yes	6.6.1.2	R1-103062	Supporting frequency diversity and frequency selective R-PDCCH transmission	NEC Group	Not treated
Yes	6.6.1.2	R1-103063	R-PDCCH blind decoding for frequency diversity and frequency selective R-PDCCH transmission	NEC Group	Not treated
Yes	6.2.3.2	R1-103064	Blind Decoding and search space for Carrier Aggregation	Research In Motion UK Limited	Noted
Yes	6.2.3.3	R1-103065	Remaining issues for cross-carrier scheduling	Research In Motion UK Limited	Not treated
Yes	6.2.5.2	R1-103066	PH reporting for Carrier Aggregation	Research In Motion UK Limited	Not treated
Yes	6.2.4.3	R1-103067	UCI transmission in the presence of UL-SCH data	Research In Motion UK Limited	Not treated
Yes	6.3.4	R1-103068	Feedback Reduction in DL MU-MIMO using Pre-Assigned Companion Subsets	Research In Motion UK Limited	Not treated
Yes	6.3.4	R1-103069	Companion Subset Based PMI/CQI Feedback for LTE-A MU-MIMO	Research In Motion UK Limited	Not treated
Yes	6.4.2	R1-103070	Multiplexing Capacity for LTE-A PUCCH Format 2/2a/2b with Transmit Diversity	Research In Motion UK Limited	Not treated
Yes	6.5.2.1	R1-103071	Aperiodic SRS with Configurable Duration	Research In Motion UK Limited	Noted
Yes	6.6.2	R1-103072	Serving Cell Selection in a Heterogeneous network with Type 1 Relay	Research In Motion UK Limited	Not treated

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Yes	5.1.1	R1-103073	25.214 CR0605 (Rel-7, F) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA_PCH	Infineon Technologies	Revised
Yes	5.1.1	R1-103074	25.214 CR0606 (Rel-8, A) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA_PCH	Infineon Technologies	Revised
Yes	5.1.1	R1-103075	25.214 CR0607 (Rel-9, A) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA_PCH	Infineon Technologies	Revised
Yes	5.2.1	R1-103076	Further considerations on HS-DPCCH frame structure design for 4C-HSDPA	InterDigital Communications, LLC	Not treated
Yes	5.2.2	R1-103077	Considerations for 4-carrier HSDPA DRX Design	InterDigital Communications, LLC	Revised
Yes	5.2.2	R1-103078	Timer based secondary serving HS-DSCH cell deactivation	InterDigital Communications, LLC	Noted
Yes	5.2.2	R1-103079	Consideration of CQI Feedback Design for 4-carrier HSDPA	InterDigital Communications, LLC	Noted
Yes	4	R1-103080	LS reply on configurable transmission modes for Category 1 UE	Huawei	Noted - Revised
Yes	4	R1-103081	LS reply on Primary Component Carrier and Semi-Persistent Scheduling	Huawei, CMCC	Noted - Revised
Yes	6.2.1	R1-103082	PCFICH on Cross-Carrier scheduling	Huawei	Not treated
Yes	6.2.3.2	R1-103083	Search spaces on one CC for the cross-CC scheduling	Huawei, CMCC	Not treated
Yes	6.2.3.2	R1-103084	PDCCH blind decoding in LTE-A	Huawei	Noted
Yes	6.2.3.2	R1-103085	PDCCH design to reduce the convolutional decoding numbers on DSS	Huawei	Noted
Yes	6.2.3.3	R1-103086	Analysis of solutions for handling DCI format ambiguity between CSS and UESS at cross-carrier scheduling	Huawei, CMCC	Not treated
Yes	6.2.4.1	R1-103087	Overview of UL ACK/NACK feedback design issues for carrier aggregation	Huawei	Not treated
Yes	6.2.4.1	R1-103088	A/N Codebook Design with DTX for Carrier Aggregation	Huawei	Not treated
Yes	6.2.4.2	R1-103089	SORTD resource allocation for PUCCH format 1a/1b	Huawei	Not treated
Yes	6.2.4.3	R1-103090	CQI/PMI/RI reporting for carrier aggregation	Huawei	Not treated
Yes	6.2.5.1	R1-103091	Pathloss derivation for UL PC in LTE-A	Huawei	Not treated
Yes	6.2.5.2	R1-103092	PHR for UL PC in LTE-A	Huawei	Not treated
Yes	6.2.5.4	R1-103093	Consideration of DCI 3/3A for Carrier Aggregation	Huawei	Not treated
Yes	6.2.5.5	R1-103094	Uplink multi-antenna power control	Huawei	Not treated
Yes	6.2.6	R1-103095	Noncontiguous PUSCH resource allocation	Huawei	Noted
Yes	6.3.1.1	R1-103096	Downlink DMRS design for retransmission.	Huawei	Noted
Yes	6.3.1.2	R1-103097	DMRS PRB Bundling discussion	Huawei	Noted

Yes	6.3.1.3	R1-103098	OCC mapping scheme for downlink DMRS	Huawei	Noted
Yes	6.3.1.4	R1-103099	DMRS pattern design for extended CP	Huawei	Not treated
Yes	6.3.2	R1-103100	Email discussion summary of CSI-RS design	Huawei	Noted
Yes	6.3.2.1	R1-103101	CSI RS pattern design	Huawei	Noted
Yes	6.3.2.2	R1-103102	Evaluation on muting benefit for CSI RS design	Huawei	Revised
Yes	6.3.3.1	R1-103103	DCI discussion on transparent MU-MIMO	Huawei	Not treated
Yes	6.3.3.2	R1-103104	DMRS for MU MIMO	Huawei	Not treated
Yes	6.3.4	R1-103105	DL codebook for 8TX	Huawei	Revised
Yes	6.3.4	R1-103106	Double codebook based Differential feedback	Huawei	Not treated
Yes	6.3.4	R1-103107	Feedback of Long Term Channel Information for Adaptive Codebook	Huawei	Noted
Yes	6.4.1	R1-103108	Uplink transmission modes	Huawei	Not treated
Yes	6.4.1	R1-103109	Transmission mode configuration and the mapping of PA/Antenna to CC	Huawei	Noted
Yes	6.4.2	R1-103110	Transmit diversity for PUCCH format 2/2a/2b	Huawei	Not treated
Yes	6.4.3	R1-103111	Comparison of of Multiplexing Schemes of control and data in multi-layer PUSCH transmission	Huawei	Not treated
Yes	6.4.4	R1-103112	Design of codeword to layer mapping for UL MIMO	Huawei	Not treated
Yes	6.5.1.1	R1-103113	Email discussion summary of sequence/group hopping for OCC support in UL DMRS enhancement	Huawei	Noted
Yes	6.5.1.1	R1-103114	Methods to support OCC in sequence hopping/ group hopping configuration	Huawei	Not treated
Yes	6.5.2.1	R1-103115	Sounding procedure and design for aperiodic sounding	Huawei	Noted
Yes	6.5.2.2	R1-103116	Sounding extension using DMRS	Huawei	Not treated
Yes	6.6.1.1	R1-103117	Clarification of Optional for DL RN Timing support	Huawei	Not treated
Yes	6.6.1.1	R1-103118	Starting time of R-PDCCH&R-PDSCH	Huawei	Noted
Yes	6.6.1.2	R1-103119	Comparison between PDCCH and R-PDCCH for Type1 Half Duplex Relay	Huawei	Not treated

Yes	6.6.1.2	R1-103120	R-PDCCH Multiplexing for DL Grant Only and UL Grant Only	Huawei	Not treated
Yes	6.6.1.3	R1-103121	Un HARQ Timing for FDD	Huawei	Not treated
Yes	6.6.1.3	R1-103122	Un subframe allocation for FDD	Huawei	Not treated
Yes	6.6.2	R1-103123	Frequency diversity techniques and rate-matching for R-PDCCH	Huawei	Not treated
No	6.6.2	R1-103124	Comparison between CRS and DMRS Demodulation for R-PDCCH	Huawei	Withdrawn
Yes	6.8	R1-103125	Evaluation of Rel-8/9 techniques and range expansion for macro and outdoor hotzone	Huawei	Not treated
Yes	6.8	R1-103126	Enhanced ICIC for control channels to support HetNet	Huawei	Noted
Yes	6.8	R1-103127	Enhanced ICIC and resource specific CQI measurement	Huawei	Not treated
Yes	6.9	R1-103128	Discussion of UE categories and capabilities	Huawei	Noted
Yes	5.2.1	R1-103129	HS-DPCCH format change due to activation and de-activation of secondary carriers	Qualcomm Incorporated	Noted
Yes	5.2.1	R1-103130	HS-DPCCH design for 3C without MIMO	Qualcomm Incorporated	Noted
Yes	5.2.2	R1-103131	CQI Configuration in 4C-HSDPA	Qualcomm Incorporated	Noted
Yes	5.2.3	R1-103132	25.211 CR Introduction of 4C-HSDPA	Qualcomm Incorporated	Not treated
Yes	5.2.3	R1-103133	25.212 CR Introduction of 4C-HSDPA	Qualcomm Incorporated	Not treated
Yes	5.2.3	R1-103134	25.213 CR Introduction of 4C-HSDPA	Qualcomm Incorporated	Not treated
Yes	5.2.3	R1-103135	25.214 CR Introduction of 4C-HSDPA	Qualcomm Incorporated	Not treated
Yes	5.2.3	R1-103136	25.215 CR Introduction of 4C-HSDPA	Qualcomm Incorporated	Not treated
Yes	5.4	R1-103137	Discussion on logical resource tag ID allocation scheme for MU-MIMO of 1.28Mcps TDD	ZTE	Revised
Yes	5.3	R1-103138	Discussion on SNPL for 1.28M TDD MC-HSUPA	ZTE	Noted
Yes	5.3	R1-103139	Discussion on E-AGCH of 1.28M TDD MC-HSUPA	ZTE	Noted
Yes	5.3	R1-103140	Discussion on UPH of 1.28M TDD MC-HSUPA	ZTE	Noted
Yes	5.3	R1-103141	Discussion on control channel DRX of 1.28M TDD MC-HSUPA	ZTE	Noted
Yes	5.6	R1-103142	Discussion on improvements of distributed antenna for 1.28Mcps TDD	ZTE	Noted
Yes	6.3.2.1	R1-103143	Consideration on intra cell CSI-RS pattern	CATR	Noted
Yes	6.6.1.2	R1-103144	Consideration regarding the numer REGs in R-PDCCH	LG-Nortel	Not treated
Yes	6.6.1.2	R1-103145	R-PDCCH Multiplexing for LTE-A relay node	LG-Nortel	Not treated

Yes	5.1.2	R1-103146	25.221 CR0207 (Rel-8, F) Clarification for support of an E-HICH pair for 1.28Mcps TDD	TD Tech	Noted - Revised
Yes	5.1.2	R1-103147	25.221 CR0208 (Rel-9,A) Clarification for support of an E-HICH pair for 1.28Mcps TDD	TD Tech	Noted - Revised
Yes	5.3	R1-103148	Email Discussion Summary for LCR TDD MC-HSUPA	TD Tech	Noted
Yes	5.3	R1-103149	Discussion on DRX procedures for MC-HUSPA	TD Tech	Noted
Yes	5.3	R1-103150	Discussion on synchronisation procedures for MC-HUSPA	TD Tech	Noted
Yes	5.3	R1-103151	E-RUCCH of MC-HSUPA UE for LCR TDD	TD Tech	Revised
Yes	5.3	R1-103152	UPH reporting of MC-HSUPA UE for LCR TDD	TD Tech	Noted
Yes	5.4	R1-103153	Signature sequence allocation in MU MIMO for LCR TDD	TD Tech	Noted
Yes	5.4	R1-103154	Discussion on standalone midamble channel assisted MU-MIMO for 1.28Mcps TDD	TD Tech	Noted
Yes	6.8	R1-103155	Downlink ICIC in heterogeneous networks	TD Tech	Not treated
Yes	6.5.2.1	R1-103156	Aperiodic SRS Design for LTE-A	Motorola, CMCC	Noted
Yes	6.2.4.1	R1-103157	Uplink ACK/NACK Transmission Format for Carrier Aggregation	Motorola	Not treated
Yes	6.2.6	R1-103158	Resource allocation schemes for non-contiguous PUSCH	Motorola	Not treated
Yes	6.2.2	R1-103159	PHICH Resource Selection for LTE-A	Motorola	Not treated
Yes	6.8	R1-103160	System Performance of HetNet with Pico eNB	Motorola	Not treated
Yes	6.8	R1-103161	Antenna pattern for Pico Cells	Motorola	Not treated
Yes	6.3.4	R1-103162	Details of feedback design for 8Tx and 4Tx for LTE-A	Motorola	Not treated
Yes	6.3.2.2	R1-103163	Views on muting and reuse factors for CSI-RS	Motorola	Not treated
Yes	6.3.3.2	R1-103164	Results on DM RS port allocation for MU-MIMO	Motorola	Not treated
Yes	6.3.3.1	R1-103165	Transparent MU-MIMO operation for Rel-10	Motorola	Not treated
Yes	6.3.1.2	R1-103166	Results on PRB bundling for MU-MIMO	Motorola	Noted
Yes	6.2.1	R1-103167	PCFICH in Carrier Aggregation	Motorola	Not treated
Yes	6.2.3.2	R1-103168	Blind decoding and search spaces for Carrier Aggregation	Motorola	Noted
Yes	6.2.5.3	R1-103169	Power Scaling for LTE-A	Motorola	Not treated
Yes	6.2.6	R1-103170	Impact of UE power control errors on non-contigous PUSCH performance	Motorola	Noted
Yes	6.8	R1-103171	Enhanced ICIC techniques	Motorola	Noted
No	6.8	R1-103172	System Simulations of Enhanced ICIC techniques	Motorola	Withdrawn

Yes	6.6.1.2	R1-103173	Backhaul control channel design	Motorola	Not treated
Yes	6.6.1.3	R1-103174	Relay HARQ	Motorola	Not treated
No	6.2.5.1	R1-103175	Further details on UL Power Control	Motorola	Withdrawn
Yes	6.3.4	R1-103176	Two-component Feedback Design and Codebooks	Motorola	Revised
Yes	6.2.5.5	R1-103177	UL Power Control for Multi-Antenna UE	Motorola	Not treated
Yes	6.4.1	R1-103178	On UL Multi-Antenna Transmission Modes and Signaling Support	Motorola	Not treated
Yes	6.3.2.1	R1-103179	CSI-RS Pattern Design based on CSM	Motorola	Noted
Yes	6.4.3	R1-103180	UCI Multiplexing on PUSCH in UL-MIMO Transmissions	Motorola	Not treated
Yes	6.8	R1-103181	On Range Extension in Open-access Heterogeneous Networks	Motorola	Not treated
Yes	6.2.6	R1-103182	DCI format for Non-contiguous PUSCH resource block allocation	Motorola	Noted
Yes	6.3.1.1	R1-103183	DM-RS Layer Mapping and Control Signalling	Motorola	Noted
Yes	6.3.1.4	R1-103184	Extended CP DM-RS Pattern	Motorola	Not treated
Yes	6.3.3.2	R1-103185	DM-RS Ports / Scrambling Sequence Design for DLSingle Cell MU-MIMO	Motorola	Not treated
Yes	6.5.1.1	R1-103186	OCC with Sequence Hopping for Uplink DM-RS	Motorola	Not treated
Yes	6.5.2.1	R1-103187	LTE-A Dynamic Aperiodic SRS - Duration, Timing, and Carrier Aggregation	Motorola	Not treated
Yes	6.5.2.2	R1-103188	Other SRS Enhancements for LTE-A	Motorola	Not treated
Yes	6.2.5.2	R1-103189	Power headroom report in LTE-A	ASUSTeK	Not treated
Yes	6.2.5.4	R1-103190	Consideration on DCI Format 3／3A for Cross-Carrier Scheduling	ASUSTeK	Not treated
Yes	6.2.6	R1-103191	Non-contiguous uplink resource allocation for LTE-A	ASUSTeK	Not treated
Yes	6.4.4	R1-103192	PHICH mapping for UL SU-MIMO	Nokia Siemens Networks, Nokia	Noted
Yes	6.5.2.2	R1-103193	Increasing sounding resources for Rel-10	Texas Instruments	Not treated
Yes	6.2.4.1	R1-103194	Channel Selection Methods for ACK/NACK Transmission in CA	ETRI	Not treated

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Yes	6.2.4.1	R1-103195	PUCCH ACK/NAK multiplexing and resource allocation for carrier aggregation	ETRI	Not treated
Yes	6.2.7	R1-103196	Control Channel Power Control in CSG Cell	ETRI	Not treated
Yes	6.4.4	R1-103197	PHICH Resource Allocation Method for UL SU-MIMO	ETRI	Noted
Yes	6.8	R1-103198	Enhancement of Rel-8/9 ICIC mechanisms considering relays	ETRI	Not treated
Yes	5.2.1	R1-103199	Way forward for HS-DPCCH for 4C-HSDPA	Ericsson, ST-Ericsson	Revised
Yes	6.2.6	R1-103200	Summary of email discussion on PUSCH resource allocation	Panasonic	Noted
Yes	6.2.1	R1-103201	Cross-carrier control region indication	Sharp	Not treated
Yes	6.2.2	R1-103202	Handling PHICH collisions in Carrier Aggregation	Sharp	Not treated
Yes	6.2.5.2	R1-103203	Separate power headroom reporting for PUCCH and PUSCH in LTE-A	Sharp	Not treated
Yes	6.2.5.3	R1-103204	Power scaling to zero in LTE-A UL power control	Sharp	Noted
Yes	6.2.5.5	R1-103205	Issues with per-antenna uplink power control	Sharp	Not treated
Yes	6.2.6	R1-103206	Performance of non-contiguous resource allocation with power back-off and TPC error	Sharp	Noted
Yes	6.4.2	R1-103207	PUCCH TxD for Formats 2/2a/2b for LTE-Advanced	Sharp	Not treated
Yes	6.4.3	R1-103208	Performance issues for UCI transmission on PUSCH with SU-MIMO	Sharp	Not treated
Yes	6.5.1.1	R1-103209	Design of OCC for DMRS	Sharp	Not treated
Yes	6.5.2.1	R1-103210	Further discussion on Dynamic Aperiodic SRS	Sharp	Noted
Yes	6.3.4	R1-103211	Successive Codebook Refinement: Further details and evaluation	Marvell	Not treated
Yes	6.3.4	R1-103212	Covariance Compression for Codebook Adaptation	Marvell	Not treated
Yes	6.3.4	R1-103213	Codebook Refinement under Constant-Modulus constraint	Marvell	Not treated
Yes	6.8	R1-103214	Downlink data channel performance of interference management for Macro + Outdoor hotzones	ZTE	Not treated
Yes	6.5.2.1	R1-103215	Aperiodic sounding reference signals for release 10	Ericsson, ST-Ericsson	Noted
Yes	6.2.3.1	R1-103216	DL component carrier grouping	Fujitsu	Revised
Yes	6.2.3.2	R1-103217	UE-specific search space location offset across DL component carriers	Fujitsu	Not treated

Yes	6.2.3.2	R1-103218	Search space size extension	Fujitsu	Not treated
No	6.2.4.1	R1-103219	UL ACK/NACK Transmission for Carrier Aggregation	Fujitsu	Withdrawn
Yes	6.3.1.3	R1-103220	DM-RS OCC design for Rank 5-8 in LTE-Advanced	Fujitsu	Noted
Yes	6.3.4	R1-103221	Discussion on Feedback Design for LTE-A	Fujitsu	Not treated
Yes	6.3.4	R1-103222	Considerations on codebook and feedback design	Fujitsu	Not treated
Yes	6.4.4	R1-103223	Codeword to Layer Mapping for Multiple Layers MIMO Systems	Fujitsu	Not treated
Yes	6.5.2.1	R1-103224	On resource allocation of dynamic aperiodic SRS	Fujitsu	Noted
No	6.5.2.1	R1-103225	CIF inclusion in DCI format for dynamic aperiodic SRS transmission	Fujitsu	Withdrawn
Yes	6.6.1.3	R1-103226	Backhaul HARQ Timing for LTE-A TDD	Fujitsu	Not treated
Yes	6.8	R1-103227	Interference coordination for control channels for HetNet	Fujitsu	Noted
Yes	6.3.1.2	R1-103228	Discussion on the impact of PRB bundling on MU-MIMO	CMCC	Not treated
Yes	6.3.3.2	R1-103229	DMRS indication in DL enhanced Multiple antenna transmission	CMCC	Not treated
Yes	6.3.2.1	R1-103230	Further considerations on intra-cell CSI-RS design	CMCC	Noted
Yes	6.6.1.1	R1-103231	UL Backhaul Timing for TDD Relay	CMCC	Not treated
Yes	6.6.1.2	R1-103232	Clarification on R-PDCCH	CMCC	Not treated
Yes	6.6.2	R1-103233	36.814 CR0001 (Rel-9, F) Clarification for inband Relay definitions	CMCC	Not treated
Yes	6.6.2	R1-103234	36.912 CR0006 (Rel-9, F) Mirror clarification for inband Relay definition	CMCC	Not treated
Yes	6.8	R1-103235	Control channel performance considering downlink interference between the femto cells	CMCC	Not treated
Yes	6.9	R1-103236	On Network Energy Saving for E-UTRAN	CHTTL	Not treated
Yes	6.3.4	R1-103237	Considerations on the Rel-10 feedback framework	CHTTL	Not treated
Yes	6.2.6	R1-103238	Multi-cluster PUSCH resource allocation	Mitsubishi Electric	Noted
Yes	6.2.6	R1-103239	Details on multi-cluster PUSCH resource allocation	Mitsubishi Electric	Not treated
Yes	6.5.1.1	R1-103240	OCC configuration for uplink DM-RS	Mitsubishi Electric	Not treated

Yes	6.5.2.2	R1-103241	SRS Assignment for UL MIMO	Mitsubishi Electric	Not treated
Yes	6.2.7	R1-103242	Consideration on Inter-CC Subframe Synchronization	Mitsubishi Electric	Not treated
Yes	6.2.1	R1-103243	PCFICH for Cross-carrier Assignment	NTT DOCOMO	Not treated
Yes	6.2.2	R1-103244	PHICH for SU-MIMO	NTT DOCOMO	Noted
Yes	6.2.3.2	R1-103245	UE-specific Search Space for Carrier Aggregation	NTT DOCOMO	Not treated
Yes	6.2.3.2	R1-103246	Investigation on UE-specific Search Space for Carrier Aggregation	NTT DOCOMO	Not treated
Yes	6.2.3.3	R1-103247	UE-specific Search Space During CIF Reconfiguration	NTT DOCOMO	Not treated
Yes	6.2.4.1	R1-103248	Uplink ACK/NACK Transmission Schemes for Carrier Aggregation	NTT DOCOMO	Not treated
Yes	6.2.4.1	R1-103249	Uplink ACK/NACK Resource Assignments for Carrier Aggregation	NTT DOCOMO	Not treated
Yes	6.2.5.5	R1-103250	Uplink Power Control for Multi-antenna Transmission	NTT DOCOMO	Not treated
Yes	6.2.6	R1-103251	Signaling to Support Non-contiguous RB Allocation	NTT DOCOMO	Noted
Yes	6.3.1.3	R1-103252	Length-4 OCC Mapping Scheme for DM-RS Rank 5-8 in LTE-Advanced	NTT DOCOMO	Noted
Yes	6.3.2.1	R1-103253	Intra-cell CSI-RS design	NTT DOCOMO	Noted
Yes	6.3.2.2	R1-103254	Performance Evaluation of RE Muting for Inter-cell CSI-RS	NTT DOCOMO	Not treated
Yes	6.3.3.1	R1-103255	Transparent/Non-transparent MU-MIMO in LTE-Advanced	NTT DOCOMO	Not treated
Yes	6.3.3.2	R1-103256	DMRS Configuration for DL MU-MIMO in LTE-Advanced	NTT DOCOMO	Not treated
Yes	6.3.3.3	R1-103257	Consideration on DCI Design for DL MIMO in Rel-10	NTT DOCOMO	Not treated
Yes	6.3.4	R1-103258	Further views on CSI Feedback for LTE-Advanced	NTT DOCOMO	Not treated
Yes	6.3.4	R1-103259	Views on CSI Reporting Scheme based on Double Codebook Structure for LTE-Advanced	NTT DOCOMO	Not treated
Yes	6.5.2.1	R1-103260	Views on Aperiosic Sounding Scheme	NTT DOCOMO	Noted
Yes	6.5.2.2	R1-103261	Periodic SRS for Multi-antenna Transmission	NTT DOCOMO	Not treated
Yes	6.6.1.2	R1-103262	On the Need of R-PHICH for Backhaul Link	NTT DOCOMO	Not treated

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Yes	6.6.2	R1-103263	Combination of Carrier Aggregation and Relay in Rel-10	NTT DOCOMO	Not treated
Yes	6.8	R1-103264	Performance of eICIC with Control Channel Coverage Limitation	NTT DOCOMO	Not treated
Yes	6.9	R1-103265	UE Categories for Rel.10	NTT DOCOMO, AT&T, TeliaSonera, Orange, Deutsche Telekom	Revised
Yes	6.9	R1-103266	Summary of e-mail Discussion on UE Categories	NTT DOCOMO	Noted
Yes	6.9	R1-103267	On Rel-10 UE Categories	Ericsson, ST-Ericsson	Noted
Yes	6.9	R1-103268	Carrier aggregation within 20 MHz bandwidth for HetNet operation	Ericsson, ST-Ericsson	Noted
Yes	6.2.4.1	R1-103269	Link-level evaluation of PUCCH proposals for Carrier Aggregation	InterDigital Communications, LLC	Noted
Yes	6.2.4.1	R1-103270	System-level evaluation of PUCCH proposals for Carrier Aggregation	InterDigital Communications, LLC	Noted
Yes	6.3.3.1	R1-103271	Discussion on transparency of LTE-A MU-MIMO	InterDigital Communications, LLC	Not treated
Yes	6.3.4	R1-103272	Performance evaluation of Long-term matrix feedback schemes	InterDigital Communications, LLC	Not treated
Yes	5.2.2	R1-103273	Power saving solutions for 4C-HSDPA	Nokia, Nokia Siemens Networks, Qualcomm	Noted
Yes	5.2.1	R1-103274	HS-DPCCH solution for 4-carrier HSDPA	Nokia, Nokia Siemens Networks	Not treated
Yes	5.5	R1-103275	Discussion on energy saving proposals	Nokia Siemens Networks, Nokia	Noted
Yes	5.5	R1-103276	TP on Cell DTX	Nokia Siemens Networks, Nokia	Noted
Yes	6.2.4.1	R1-103277	Analysis and evaluation of extended channel selection	Huawei	Revised
Yes	6.6.2	R1-103278	Asymmetric carrier configuration for Relay operation	ITRI	Not treated
Yes	6.3.4	R1-103279	Antenna configurations for practical deployments	AT&T, Orange, Vodafone	Revised
Yes	6.3.4	R1-103280	Preliminary evaluation of two-stage feedback framework with “tall” W1	Alcatel-Lucent Shanghai Bell, Alcatel-Lucent	Noted
Yes	6.3.4	R1-103281	Feedback design concept for Rel-10 extension	Toshiba	Not treated
Yes	6.3.4	R1-103282	Performance evaluation of Rel-10 feedback extensions	Toshiba	Not treated
Yes	6.3.4	R1-103283	Further details on Rel-10 feedback	Toshiba	Not treated
Yes	5.1.1	R1-103284	Efficient secondary carrier activation for DB-DC-HSDPA	Huawei	Noted
Yes	6.3.5	R1-103285	Interference Cancelling Block Modulation for Improved Cell-Edge Spectral Efficiency	CEWiT	Not treated
Yes	6.2.6	R1-103286	DCI format design for UL non-contiguous resource allocation with single antenna transmission	NEC Group	Not treated

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Yes	5.2.1	R1-103287	Way forward for HS-DPCCH for 4C-HSDPA	Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Nokia, Nokia Siemens Networks, ST-Ericsson	Revised
Yes	6.3.2.1	R1-103288	Further details on CSI-RS	Qualcomm Incorporated	Noted
Yes	6.2.3.3	R1-103289	Remaining issues on carrier indicator field	ZTE	Not treated
Yes	4	R1-103290	On LS for the CIF application cases in SPS scheduling	ZTE	Noted
Yes	6.2.5.2	R1-103291	Power headroom reporting for carrier aggregation	Ericsson, ST-Ericsson	Noted
Yes	6.7	R1-103292	Discussion on evaluation for network based positioning	Ericsson	Noted
Yes	5.2.1	R1-103293	Way forward for HS-DPCCH for 4C-HSDPA	Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Nokia, Nokia Siemens Networks, ST-Ericsson, Samsung	Noted
Yes	5.2.1	R1-103294	HS-DPCCH design for 3-carrier without MIMO	Huawei	Noted
Yes	2	R1-103295	Draft Agenda for RAN1#61 meeting	RAN1 Chairman	Approved
Yes	4	R1-103296	Reply LS on multiple timing advance for inter-band CA	RAN4, NTT DoCoMo	Noted
Yes	4	R1-103297	Signaling support for positioning reference signal muting	RAN4, Ericsson	Noted
Yes	4	R1-103298	Further clarification on downlink positioning reference signal EPRE	RAN4, Ericsson	Noted
Yes	6.2.3.1	R1-103299	DL component carrier grouping	Fujitsu	Not treated
Yes	6.7	R1-103300	Chairman notes and remaining issues for UTDOA Telephone Conference	Ad hoc chair (NTT DoCoMo)	Endorsed
Yes	6.1	R1-103301	36.214 CR0015R1 (Rel-9,F) Clarification of RSTD measurement	Ericsson, ST-Ericsson, Huawei	Agreed
Yes	6.8	R1-103302	View eICIC in Macro-cell and Femto-cell (MeNB-HeNB)	Toshiba	Not treated
Yes	6.2.3.3	R1-103303	Discussion on remaining issues for CIF in LTE-A	CATT	Not treated
Yes	6.7	R1-103304	UTDOA Evaluation Assumptions	TruePosition	Noted
Yes	6.1	R1-103305	Discussion on MBMS capability	Panasonic	Noted
Yes	6.2.1	R1-103306	Way Forward on PDSCH starting position indication with cross-carrier scheduling	Panasonic, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, NTT DOCOMO, LGE, Huawei, NEC, ZTE, Philips, Pantech, Sharp, HTC	Noted
Yes	6.5.1.1	R1-103307	UL DMRS design with OCC	CATT	Not treated
Yes	5	R1-103308	Minutes from RAN1#61 HSPA sessions	Ad Hoc chairman (Ericsson)	Endorsed
Yes	5.2.1	R1-103309	Additional considerations on HS-DPCCH optimizations for 2C-HSDPA	Ericsson, ST-Ericsson	Noted

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Yes	5.1.2	R1-103310	25.221 CR0207R1 (Rel-8, F) Clarification for support of an E-HICH pair for 1.28Mcps TDD	TD Tech	Agreed
Yes	5.1.2	R1-103311	25.221 CR0208R1 (Rel-9, A) Clarification for support of an E-HICH pair for 1.28Mcps TDD	TD Tech	Agreed
Yes	5.1.1	R1-103312	25.214 CR0605R1 (Rel-7, F) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA_PCH	Infineon Technologies	Noted - Revised
Yes	5.3	R1-103313	Way forward on MC-HSUPA E-RUCCH for LCR TDD	TD Tech, ZTE, CATT, New Postcom, Ericsson	Agreed
Yes	5.1.1	R1-103314	25.214 CR0605R2 (Rel-7, F) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA_PCH	Infineon Technologies, Qualcomm Incorporated	Noted
Yes	5.1.1	R1-103315	25.214 CR0606R1 (Rel-8, A) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA_PCH	Infineon Technologies, Qualcomm Incorporated	Noted
Yes	5.1.1	R1-103316	25.214 CR0607R1 (Rel-9, A) Clarification of HS-DSCH and HS-SCCH reception in CELL_FACH, CELL_PCH and URA_PCH	Infineon Technologies, Qualcomm Incorporated	Noted
Yes	5.5	R1-103317	TP for TR 25.927 on Dormant mode	Huawei, Ericsson	Agreed
Yes	5.5	R1-103318	TP for TR25.927 on Secondary antenna deactivation	ZTE, Ericsson, China Unicom	Agreed
Yes	5.5	R1-103319	TP for TR25.927 on Power control of common channels	ZTE, Nokia Siemens Networks	Noted - Revised
Yes	5.5	R1-103320	TP for TR25.927 on Cell DTX	Alcatel-Lucent, Nokia Siemens Networks	Agreed
Yes	5.2.2	R1-103321	[DRAFT] LS on agreements on HS-DPCCH design for 4C-HSDPA	Qualcomm Incorporated	Noted - Revised
Yes	6.4.1	R1-103322	Further Discussions on UL MIMO signaling requirements	Samsung	Not treated
Yes	6.3.4	R1-103323	Discussion on Two-component Feedback Framework for 8Tx	ZTE	Not treated
Yes	6.3.4	R1-103324	Way Forward on Rel. 10 UE Feedback	Samsung, ETRI, Pantech, Intel, Toshiba, NEC, ZTE	Noted
Yes	6.3.4	R1-103325	Joint Proposal on Rel. 10 UE Feedback	Samsung, ZTE, Intel, NEC	Noted
Yes	6.6.1.1	R1-103326	WF on relay UL timing	Ericsson, ST-Ericsson, Huawei, LG Electronics, HTC, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT	Noted - Revised
Yes	6.6.1.3	R1-103327	WF on Un HARQ timeline (FDD)	Ericsson, ST- Ericsson, Nokia, Nokia Siemens Networks, Huawei, RIM, Panasonic, NEC, ITRI, InterDigital, ZTE, CATT	Noted - Revised
Yes	6.3.4	R1-103328	Two-component Feedback Design and Codebooks	Motorola	Not treated
Yes	6.4.3	R1-103329	UCI Multiplexing on PUSCH for Rel-10 UL SU-MIMO	Texas Instruments	Noted

Yes	6.3.4	R1-103330	CSI Feedback Design for Rel-10 DL MIMO	Texas Instruments	Not treated
Yes	4	R1-103331	Reply LS on CSI RS boosting impact on BS transmission distortion	RAN4, Nokia Siemens Networks, Huawei	Noted
Yes	6.3.4	R1-103332	WF on UE Feedback	Ericsson, NTT DoCoMo, Samsung, CATT, Texas Instruments, Panasonic, Nokia, Nokia Siemens Networks, Philips, LG Electronics, Motorola, ST-Ericsson, AT&T, Sharp, Mitsubishi Electric, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, NEC, Huawei, ZTE, Fujitsu	Agreed
Yes	6.3.4	R1-103333	Refinements of Feedback and Codebook Design	Ericsson, ST-Ericsson	Noted
Yes	6.3.3.2	R1-103334	WF on DL MU-MIMO	Broadcom, CATT, CATR, CEWiT, CHTTL, CMCC, Ericsson, ST-Ericsson, Fujitsu, HTC, HT mMobile, ITRI, LG Electronics, MediaTek, NewPostCom, Nokia, Nokia Siemens Networks, NTT DOCOMO, Panasonic, Samsung,	Noted
Yes	6.3.4	R1-103335	Rel-10 codebook design issues for downlink transmission	Pantech	Noted
Yes	6.5.2.1	R1-103336	Proposal for UL sounding resource extension	Huawei, CMCC, Fujitsu, HTC, Potevio, RIM, TI	Noted
Yes	6.5.2.1	R1-103337	Proposal on aperiodic SRS duration	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Huawei, LG Electronics, Motorola, Nokia, Nokia Siemens Networks, Sharp, Research In Motion, Texas Instruments	Noted
Yes	6.3.4	R1-103338	Simulation assumptions Rel-10 feedback for 4Tx	Huawei, Samsung, Ericsson, Ericsson ST, Marvell, Toshiba, Fujitsu, Intel, ALU, ALU Shanghai Bell, HTC, ZTE	Noted
Yes	6.6.1.2	R1-103339	WF on Multiplexing Un DL data and DL grant	LGE, ZTE, Huawei, ETRI, Motorola, CATT, Research In Motion, Samsung, Texas Instruments, HTC, CMCC, LG-Nortel, Pantech	Noted - Revised

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Yes	6.3.4	R1-103340	Simulation assumptions Rel-10 feedback for 4Tx	Huawei, Orange, Samsung, Ericsson, Ericsson ST, Marvell, Toshiba, Fujitsu, Intel, ALU, ALU Shanghai Bell, HTC, ZTE, Philips, Motorola	Noted - Revised
Yes	6.6.1.2	R1-103341	Summary of R-PDCCH mapping and related	ZTE	Noted
Yes	6.6.1.2	R1-103342	WF on R-PDCCH interleaving with CRS	ZTE, Huawei, NEC, Nokia, NSN, CATT, Qualcomm Inc., CMCC, LG-Nortel, RIM, HTC, ETRI	Noted - Revised
Yes	6.3.3.2	R1-103343	Way forward for Rel-10 MU-MIMO	Huawei, HTC, Motorola, NEC, Philips, Pantech, Potevio, Qualcomm, Research In Motion, TD-Tech, ZTE	Revised
Yes	6.3.3.2	R1-103344	Link level evaluation of DM RS ports for MUMIMO	Huawei	Not treated
Yes	6.6.1.3	R1-103345	Joint Proposal on Un UL HARQ (FDD)	Panasonic, Ericsson, ST-Ericsson	Not treated
Yes	6.3.4	R1-103346	Simulation assumptions Rel-10 feedback for 4Tx	Huawei, Orange, Samsung, Ericsson, Ericsson ST, Marvell, Toshiba, Fujitsu, Intel, ALU, ALU Shanghai Bell, HTC, ZTE, Philips, Motorola	Agreed
Yes	6.2.3.2	R1-103347	Summary of email discussion on the PDCCH search space design	LGE	Noted
Yes	6.9	R1-103348	UE Categories for Rel.10	NTT DOCOMO, AT&T, TeliaSonera, Orange, Deutsche Telekom, Telecom Italia	Noted
Yes	4	R1-103349	Draft LS reply on configurable transmission modes for Category 1 UE	Huawei	Noted - Revised
Yes	4	R1-103350	36.306 CR (Rel-8, F) Correction on the definition of ue-SpecificRefSigsSupported	Huawei, Panasonic, Ericsson, ST-Ericsson, NTT DOCOMO, CATT, CATR, Qualcomm Incorporated, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CMCC, Motorola, NEC, Nokia,	Endorsed
Yes	5.4	R1-103351	Discussion on logical resource tag ID allocation scheme for MU-MIMO of 1.28Mcps TDD	ZTE	Noted
Yes	5.3	R1-103352	E-RUCCH of MC-HSUPA UE for LCR TDD	TD Tech	Noted
Yes	5.5	R1-103353	On aspects of Text proposals to TR 25.927	Vodafone	Noted

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Yes	6.1	R1-103354	36.213 CR0268R1 (Rel-9,F) Clarification of PRS EPRE	Ericsson, ST-Ericsson, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, Qualcomm Inc.	Agreed
Yes	6.2.5.3	R1-103355	WF for power scaling in case of power limitation	Huawei, Motorola, Qualcomm	Noted
Yes	5.5	R1-103356	TP to TR25.927: Dynamic switch on/off secondary antenna in MIMO system	ZTE, China Unicom	Noted
Yes	6.2.5.2	R1-103357	[Draft] LS on power headroom reporting for carrier aggregation	Qualcomm Incorporated	Noted - Revised
Yes	6.2.5.3	R1-103358	DRAFT LS on uplink power control for carrier aggregation	Ericsson	Noted - Revised
Yes	6.2.1	R1-103359	On the PCFICH detection in cross-carrier scheduling	Pantech	Not treated
Yes	6.2.1	R1-103360	On the cross-carrier CFI signaling by PDCCH	Pantech	Not treated
Yes	6.2.4.1	R1-103361	Analysis and evaluation of extended channel selection	Huawei	Noted
Yes	4	R1-103362	36.306 CR (Rel-9, A) Correction on the definition of ue-SpecificRefSigsSupported	Huawei, Panasonic, Ericsson, ST-Ericsson, NTT DOCOMO, CATT, CATR, Qualcomm Incorporated, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CMCC, Motorola, NEC, Nokia,	Endorsed
Yes	6.3.4	R1-103363	DL codebook for 8TX	Huawei	Not treated
Yes	6.3.2.2	R1-103364	Evaluation on muting benefit for CSI RS design	Huawei	Not treated
Yes	6.2.3.3	R1-103365	Review of CIF Reconfiguration	Philips	Not treated
Yes	6.2.1	R1-103366	WF on DCI based indication of PDSCH starting position with cross carrier scheduling	Panasonic, NTT DoCoMo, Huawei, Philips, ZTE	Noted
Yes	6.2.4.1	R1-103367	Evaluation of Carrier Aggregation PUCCH Proposals with Advanced Receivers	Ericsson, ST-Ericsson	Noted
Yes	6.3.1.4	R1-103368	DM-RS views on extended CP	Nokia, Nokia Siemens Networks	Not treated
Yes	6.3.1.3	R1-103369	WF on power balancing of Rel-10 DM RS	AT&T, Broadcom, CeWit, CHTTL, ETRI, HTC, HT `mMobile, I2R, Intel, ITRI, LGE, MediaTek, mimoOn, Motorola, Pantech, Research In Motion, Samsung, Texas	Noted
Yes	5.2.2	R1-103370	Considerations for 4-carrier HSDPA DRX Design	InterDigital Communications, LLC	Noted
Yes	6.2.5.3	R1-103371	LS on uplink power control for carrier aggregation	RAN1, Ericsson	Agreed
Yes	4	R1-103372	Draft response to LS from RAN4 on simultaneous PUSCH and PUCCH and clustered SC-FDMA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Noted - Revised
Yes	4	R1-103373	Draft response to LS from RAN4 on simultaneous PUSCH and PUCCH and clustered SC-FDMA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Noted - Revised

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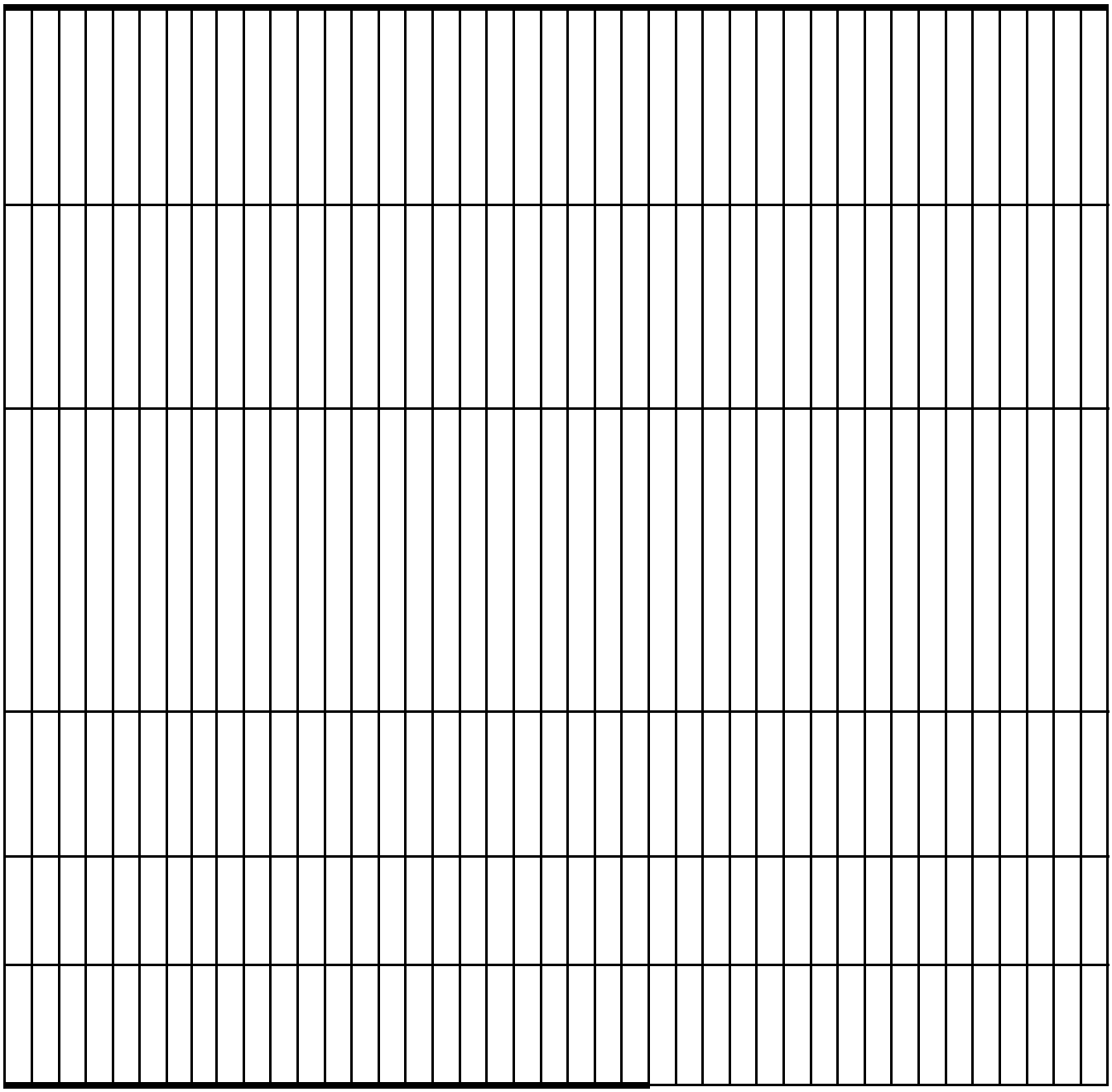
Yes	6.3.1.2	R1-103374	WF on PRB bundling in Rel-10	AT&T, CATT, CHTTL, Ericsson, ETRI, HTC, HT mMobile, Institute for Information Industry, Intel, LG Electronics, Marvell, MediaTek, NEC, Pantech, Samsung, ST-Ericsson, Texas Instruments.	Noted
Yes	6.3.2.1	R1-103375	CSI-RS pattern and configuration	ZTE	Noted
Yes	6.3.4	R1-103376	Antenna configurations for practical deployments	AT&T, CMCC, Deutsche Telekom, NTT DOCOMO, Orange, Vodafone	Noted
Yes	6.3.4	R1-103377	Views on the feedback framework for Rel. 10	Samsung	Noted
Yes	6.3.4	R1-103378	Performancce evaluations of Rel. 10 feedback framework	Samsung	Noted
Yes	6.3.4	R1-103379	Control signaling to support feedback enhancements in Rel. 10	Samsung	Not treated
Yes	6.3.1.4	R1-103380	DM RS for extended CP	Samsung	Not treated
Yes	6.3.2.1	R1-103381	WF for CSI-RS	LG Electronics, NTT-DoCoMo, Nokia, Nokia Siemens Networks, Sharp, NEC, ETRI, Pantech, Research In Motion, HTC, Texas Instruments, Fujitsu	Noted
Yes	6.3.2.2	R1-103382	Link level analysis on RE muting for CSI-RS design: Step2 evaluation	Panasonic	Not treated
Yes	6.3.1.4	R1-103383	Way forward on DM-RS pattern for extended CP	CMCC, CATT, Ericsson, LG Electronics, NEC, Nokia, Nokia Siemens Networks, ST-Ericsson, ZTE	Not treated
Yes	6.3.2.1	R1-103384	WF on CSI RS pattern	Huawei, CATR, CATT, Ericsson, HT mMobile, ITRI, Mediatek, ST Ericsson, Potevio	Noted
Yes	6.3.1.2	R1-103385	WF about PRB Bundling	CMCC, CATR, Fujitsu, Motorola, Huawei, Potevio, Qualcomm, TD-Tech	Noted
Yes	6.3.1.3	R1-103386	Way forward on OCC mapping for DM-RS rank 5-8	Fujitsu, CATT, Huawei, NTT DoCoMo, Potevio, Toshiba	Noted
Yes	6.8	R1-103387	Cell Association Enhancements for HetNet	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Not treated
Yes	6.3.2.1	R1-103388	WF on CSI RS and antenna port 5 coexistence	CMCC, CATT, CATR, Huawei, Motorola, Potevio, Qualcomm	Noted

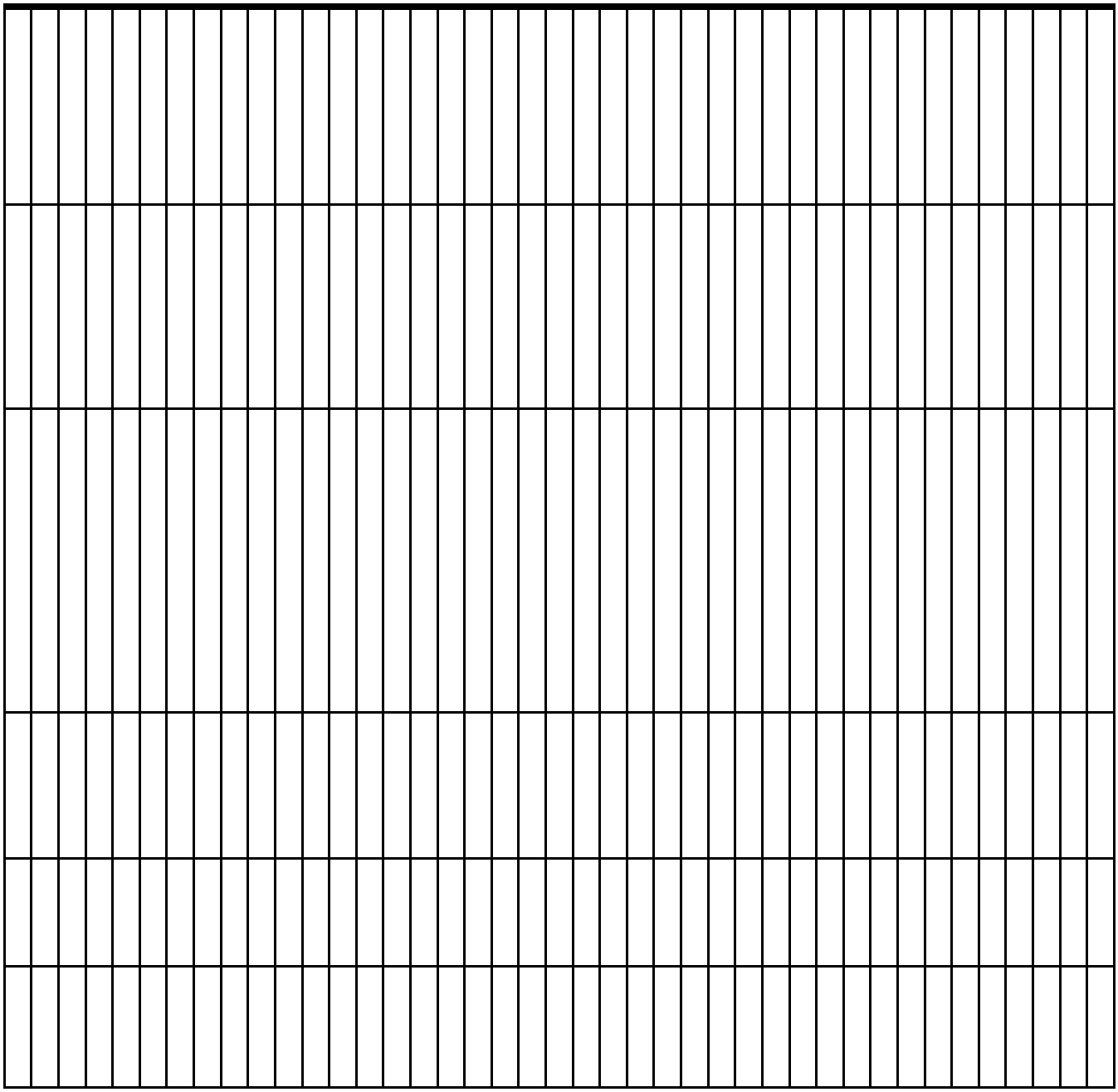
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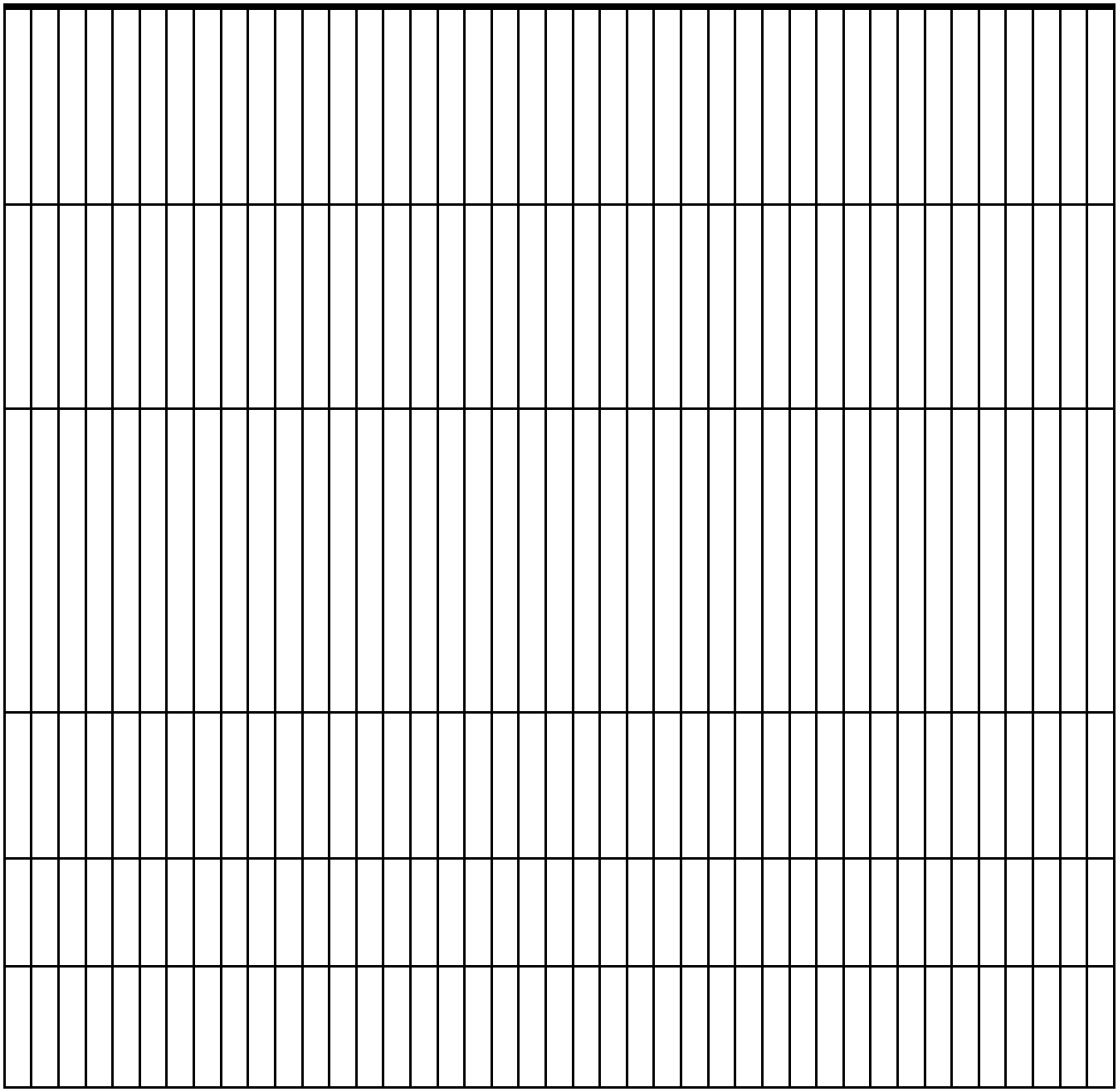
Yes	6.8	R1-103389	WF on Identification of Co-channel Problem and Needs in Macro-Femto	CATT, CMCC, CATR, HTC, Huawei, KDDI, Kyocera, LGE, Motorola, Nokia, NSN, Qualcomm, RIM, Samsung, Toshiba, ZTE	Noted - Revised
Yes	6.8	R1-103390	WF on Identification of Co-channel Problem and Needs in Macro-Pico	CATT, CATR, Huawei, KDDI, Kyocera, Motorola, NTT DoCoMo, Qualcomm	Noted - Revised
Yes	6.8	R1-103391	Observations on eICIC for non-CA based HetNets	Kyocera, LGE, Qualcomm, Samsung	Not treated
Yes	6.3.4	R1-103392	Performance Evaluation of LTE-A DL MIMO with 8Tx codebook	ZTE	Not treated
Yes	6.6.1.1	R1-103393	WF on relay UL timing	Ericsson, ST-Ericsson, Huawei, LG Electronics, HTC, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT	Agreed
Yes	6.6.1.2	R1-103394	Way Forward on Un DM-RS Pattern for DL timing case 3	CMCC, ZTE, Huawei, LGE, CATR, CATT, Ericsson, ST-Ericsson, RIM, Panasonic, Vodafone	Agreed
Yes	6.6.1.1	R1-103395	[draft] LS on UL timing between eNB and relay	Ericsson	Noted - Revised
Yes	6.2.4.1	R1-103396	Way forward on support of channel selection	Panasonic, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, NTT DOCOMO, Samsung, Nokia Siemens Networks, Nokia, Fujitsu, ETRI, Motorola, ZTE, Qualcomm, Ericsson, ST-	Noted
Yes	6.2.4.1	R1-103397	ACK/NACK resource allocation in LTE-A	LG Electronics	Not treated
Yes	6.6.1.1	R1-103398	LS on UL timing between eNB and relay	RAN1, Ericsson	Noted - Revised
Yes	6.6.1.1	R1-103399	LS on UL timing between eNB and relay	RAN1, Ericsson	Agreed
Yes	6.6.1.2	R1-103400	WF on Multiplexing Un DL data and DL grant	LGE, ZTE, Huawei, ETRI, Motorola, CATT, Research In Motion, Samsung, Texas Instruments, HTC, CMCC, LG-Nortel, Pantech	Agreed
Yes	6.6.1.3	R1-103401	WF on Un HARQ timeline (FDD)	Ericsson, ST- Ericsson, Nokia, Nokia Siemens Networks, Huawei, RIM, Panasonic, NEC, ITRI, InterDigital, ZTE, CATT	Noted
Yes	6.2.3.1	R1-103402	Draft LS on linkage between PDCCH and PDSCH/PUSCH with cross carrier scheduling	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Noted - Revised
Yes	6.3	R1-103403	DL RS Chairman's notes	Ad Hoc chairman (NTT DoCoMo)	Endorsed

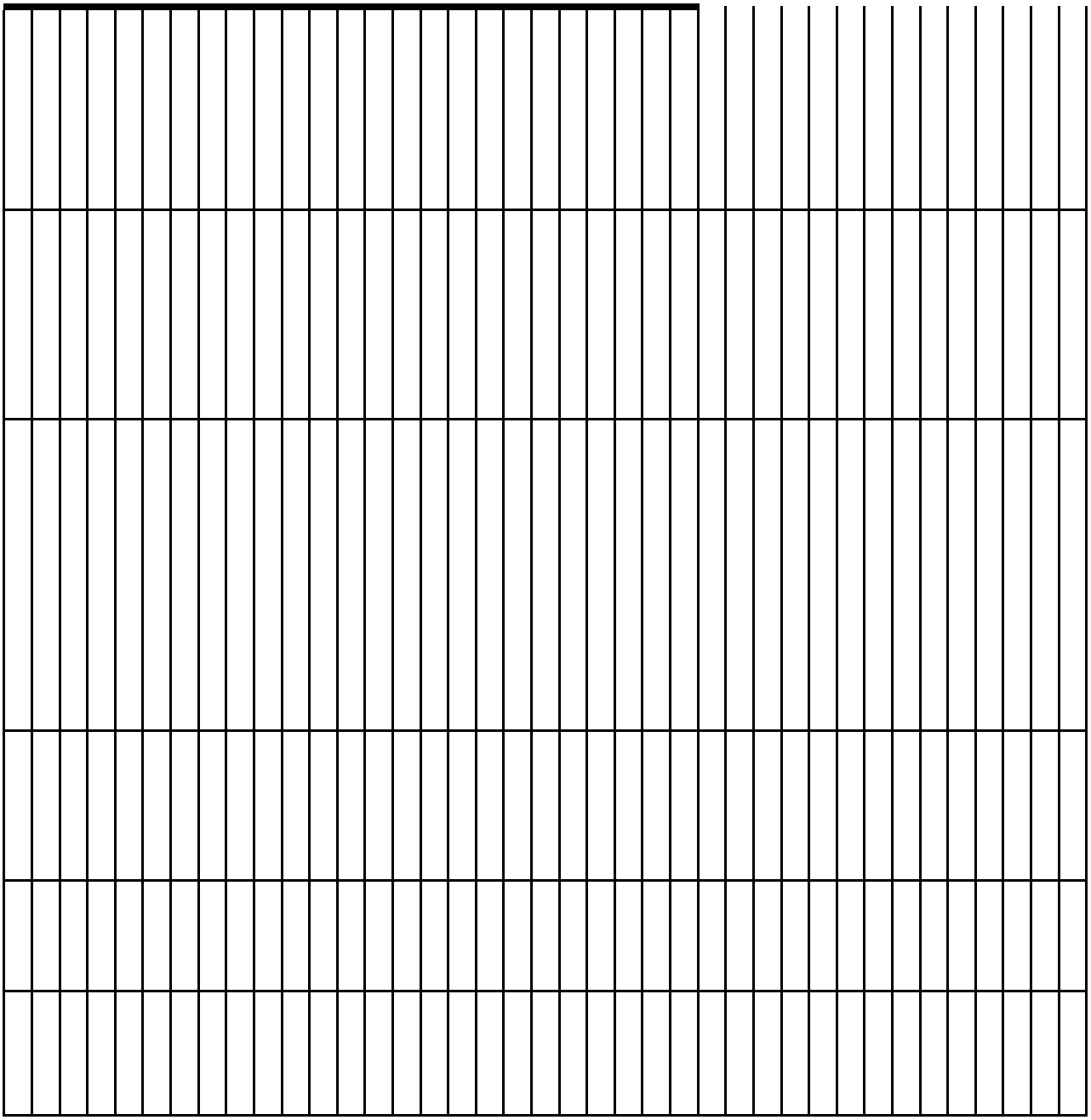
Yes	6.4	R1-103404	UL RS and UL MIMO Chairman's notes	Ad Hoc chairman (Samsung)	Endorsed
Yes	6.2.5.2	R1-103405	LS on power headroom reporting for carrier aggregation	RAN1, Qualcomm Incorporated	Agreed
Yes	6.3.3.2	R1-103406	Way forward for Rel-10 MU-MIMO	Huawei, HTC, Motorola, Philips, Pantech, Potevio, Research In Motion, TD-Tech, ZTE	Noted
Yes	5.1.1	R1-103407	25.214 CR0602R1 (Rel-7, F) Clarification of the transmit power of S-CPICH for CQI reporting when the UE is configured in	Huawei, Qualcomm Incorporated, InterDigital Communication LLC	Noted
Yes	5.1.1	R1-103408	25.214 CR0603R1 (Rel-8, A) Clarification of the transmit power of S-CPICH for CQI reporting when the UE is configured in	Huawei, Qualcomm Incorporated, InterDigital Communication LLC	Noted
Yes	5.1.1	R1-103409	25.214 CR0604R1 (Rel-9, A) Clarification of the transmit power of S-CPICH for CQI reporting when the UE is configured in	Huawei, Qualcomm Incorporated, InterDigital Communication LLC	Noted
Yes	6.7	R1-103410	Chairman's note on simulation assumptions for UTDOA	Ad Hoc chairman (NTT DoCoMo)	Endorsed
Yes	6.2.6	R1-103411	Way forward on non contiguous PUSCH Resource allocation	Samsung, Nokia, NSN, NEC, Sharp, ZTE, Ericsson, ST-Ericsson, Mitsubishi, ETRI, Texas Instruments, HTC, LG Electronics, Pantech, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, RIM,	Noted - Revised
Yes	6.2.4.1	R1-103412	Way forward on support of channel selection	CATT, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, NTT DOCOMO, Samsung, Motorola, Ericsson, ST-Ericsson, InterDigital, Texas	Noted
Yes	4	R1-103413	LS reply on configurable transmission modes for Category 1 UE	RAN1, Huawei	Agreed
Yes	6.2.3.1	R1-103414	LS to RAN2 on association between PDCCH with CIF and PDSCH / PUSCH	RAN1, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Agreed
Yes	6.2.4.1	R1-103415	Way forward on PUCCH for CA	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, ETRI, Fujitsu, Huawei, InterDigital, Nokia, NSN, NTT DoCoMo, Panasonic, Qualcomm, Samsung, ZTE	Noted
Yes	6.8	R1-103416	WF on Identification of Co-channel Problem and Needs in Macro-Femto	CATT, CMCC, CATR, ETRI, HTC, Huawei, Intel, IIR, ITRI, KDDI, Kyocera, LGE, Motorola, NEC, New Postcom, Nokia, NSN, Qualcomm, RIM, Samsung, Toshiba, ZTE	Noted - Revised
Yes	6.8	R1-103417	WF on Identification of Co-channel Problem and Needs in Macro-Pico	CATT, CATR, ETRI, Fujitsu, Huawei, ITRI, KDDI, Kyocera, Motorola, NTT DoCoMo, Qualcomm	Noted

Yes	4	R1-103418	LS reply on Primary Component Carrier and Semi-Persistent Scheduling	Huawei, CMCC, ZTE	Noted - Revised
Yes	6.3.4	R1-103419	Way-forward on CSI Feedback Design for Rel-10 DL MIMO	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, CATT, Ericsson, Huawei, LG Electronics, Marvell, Mitsubishi Electric, Motorola, Nokia, Nokia-Siemens-Networks, NTT DOCOMO, Panasonic, Qualcomm, Samsung	Agreed
Yes	6.3.1.2	R1-103420	Way Forward for Remaining Issues on PRB bundling in Rel-10	Alcatel-Lucent, Alcatel-Lucent Shanghai Bell, ASUSTek, AT&T, CATT, CeWit, CHTTL, CMCC, Ericsson, ETRI, Fujitsu, HTC, HT `mMobile, III, Intel, LG Electronics, Marvell, MediaTek, NEC, Nokia, Nokia Siemens Networks, NTT DoCoMo, Pantech, Philips, Research In Motion, Samsung, ST-Ericsson, Texas Instruments, Toshiba	Agreed
Yes	4	R1-103421	LS reply on Primary Component Carrier and Semi-Persistent Scheduling	RAN1, Huawei	Agreed
Yes	4	R1-103422	Response to LS from RAN4 on simultaneous PUSCH and PUCCH and clustered SC-FDMA	RAN1, Alcatel-Lucent, Alcatel-Lucent Shanghai Bell	Agreed
Yes	5.2.2	R1-103423	LS on agreements on HS-DPCCH design for 4C-HSDPA	RAN1, Qualcomm Incorporated	Agreed
Yes	5.5	R1-103424	Compiled TR25.927	Vodafone	Agreed
Yes	6.2.6	R1-103425	Way forward on non contiguous PUSCH Resource allocation	RAN1	Agreed
Yes	6.6.1.2	R1-103426	WF on R-PDCCH Interleaving with CRS	ZTE, Qualcomm, Panasonic, LGE, Samsung, Alcatel-Lucent, Alcatel Shanghai Bell, Vodafone	Noted
Yes	6.8	R1-103427	WF on Identification of Co-channel Problem and Needs in Macro-Femto	CATT, CMCC, CATR, ETRI, HTC, Huawei, Intel, IIR, ITRI, KDDI, Kyocera, LGE, Motorola, NEC, New Postcom, Nokia, NSN, Qualcomm, RIM, Samsung, Toshiba, ZTE	Agreed
Yes	5.5	R1-103428	TP for TR25.927 on Power control of common channels	ZTE, Nokia Siemens Networks	Agreed
Yes	6.2.4.1	R1-103429	ACK/NAK Multiplexing Simulation Assumptions in Rel-10	CATT, LG Electronics, Qualcomm Incorporated, ZTE	Noted
Yes	6.2.6	R1-103425r1	Way forward on non contiguous PUSCH Resource allocation	RAN1	Agreed









Appendix H

3GPP_TSG_RAN_WG1 Archives
May 2010, Week 1

New in LISTSERV 17.0

3GPP_TSG_RAN_WG1@LIST.ETSI.ORG

Options: Use Proportional Font
Show Text Part by Default
Show All Mail Headers

Message: [<< First] [< Prev] [Next >] [Last >>]
Topic: [<< First] [< Prev] [Next >] [Last >>]
Author: [<< First] [< Prev] [Next >] [Last >>]

Subject: [RAN1#61] An additional Ericsson/ST-Ericsson contribution
From: George Jöngren <george.jongren@ERICSSON.COM>
Reply To: George Jöngren <george.jongren@ERICSSON.COM>
Date: Wed, 5 May 2010 15:14:28 +0200
Content-Type: multipart/mixed
Parts/Attachments: text/plain (197 bytes) , text/html (1447 bytes) , R1-102628.zip (17 kB)

Dear all,

Please find attached an additional Ericsson/ST-Ericsson contribution.

Best regards,

George

6.3.2.1	Discussion/Decision	R1-102628	Considerations on CSI-RS design	Ericsson, ST-Ericsson

ONEPLUS EXHIBIT 1009
Page 343 of 349

Appendix I

LISTSERV
Connection Options
LISTSERV Archives
Search Archives
Subscriptions
Preferences
Change Password
Log Out
SCPP_TSG_MAIN_WG2 Archives
June 2020, Week 5
New to LISTSERV 17.0
SCPP_TSG_MAIN_WG2@LIST.ETSI.ORG
Options: View Formatted Topic
Show Text Part by Default
Show All Mail Headers
Message: [< Prev] [Next >] [Last >>]
Topic: [< Prev] [Next >] [Last >>]
Author: [< Prev] [Next >] [Last >>]

Subject: Re: [01.03.120.A] Email discussion on PDSCH resulting for CSI/RS design
From: "Iobachi (dtc <iabachi@ATTTOCOMO.COM>
Reply-To: "Iobachi (dtc <iabachi@ATTTOCOMO.COM>
Date: Tuesday, June 30, 2020 01:02:39 +0900
Content-Type: multipart/mixed
Parts/Attachments: textplain (28 kB), textplain (6 kB), ATT00025.zip (82 kB)

Dear all,

Attached please find the summary of email discussion on PDSCH matting

BR,
Iobachi

From: David Hammarwall [mailto:david.hammarwall@HUAWEI.COM]
Sent: Tuesday, June 30, 2020 01:02:39
To: 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG
Subject: Re: [01.03.120.A] Email discussion on PDSCH matting for CSI/RS design

Dear Iobachi,

Please find attached Ericsson/ETT/Docomo views on matting.

Best regards,

George and David

From: Iobachi, Tomohiro [mailto:Iobachi@DOCOMO-RD-I.COM]
Sent: Tuesday, June 30, 2020 01:02:39
To: 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG
Subject: Re: [01.03.120.A] Email discussion on PDSCH matting for CSI/RS design

Dear Ida-san,

Attached please find CATT's views. I am sorry for late submission.
Thank you very much.

BR
Iobachi

From: Ronald, Ida [mailto:ida.ronald@ETSI.ORG.COM]
Sent: Tuesday, June 30, 2020 01:02:39
To: 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG
Subject: Re: [01.03.120.A] Email discussion on PDSCH matting for CSI/RS design

Dear all,

Thank you for providing your views on each topic.
Please provide your comments/suggestion on the current inputs from each company. The summary is attached and also pasted below.
(If I'm wrong, new views are still welcome)

[Issue 1] no big benefits to overrule on matting from CA and QC. I propose to capture the "desperation" in views onto Email.
Supporting QC, I have listed up possible applications/ reasons/ views/ reasoning for the needs of each company.

If you have any comments/suggestion, please provide your views. Hopefully, we can converge at least on Q1 and Q2 before the meeting.

BR
Iobachi

---------- Intermediate SUMMARY ----------

1. How significant is the additional performance degradation to Rel-16 UE due to PDSCH matting on top of the degradation by CSI-RS?
   - Case1: When PDSCH matting is applied within a subframe transmitting CSI-RS of the serving cell.
   - Case2: When PDSCH matting is applied to other subframes than the ones transmitting CSI-RS of the serving cell.

Proposal Following) are captured as observation of the results of the legacy impact of PDSCH matting
- Case1 (matting within subframe) is the worst case, but it is not realistic.
  - Realistically, when PDSCH matting is applied in other subframes than the ones transmitting CSI-RS of the serving cell, the impact to Rel-16 UE is expected to be negligible (e.g. Ericsson, Nokia, Docomo)
  - Thus, it is preferable that PDSCH matting (if supported) is limited to the same subframe as the ones transmitting CSI-RS on the condition that sufficient error floors providing the matting gain can be obtained.
2. How is the performance gain of PDSCH matting against the cases of CSI-RS without PDSCH matting and CBS in terms of MIMO performance?

Proposal Following is are captured as observation of the results of the study 2 evaluation
- Significant performance gain can be observed for Rel-16 UE when PDSCH matting compared with CSI-RS without matting and CBS in channel estimation of neighboring cells.
- Insignificant performance should be considered to further study the benefit of muting

3. What is the specification impact to support PDSCH matting in Rel-16?

Proposal
- Further discussion on whether or not to support matting in Rel-16 by taking following possible specification impacts into account
  - Dual-matching around shared RE
  - Following signaling support (implicit or explicit) to UE
    - Matching pattern (RE level)
    - When RE location within one data cycle(s), where more code will be avoided at
    - Power boosting
  - Indication of muting patterns
- Power usage of shared RE

3 Others

Proposal
- Muting evaluation should include how many victim factors will be needed to obtain the gain of muting

---

From: Nitin Gad [mailto:ngad@QUALCOMM.COM]
Sent: Tuesday, June 30, 2020 01:02:40
To: 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG
Subject: Re: [01.03.120.A] Email discussion on PDSCH matting for CSI/RS design

Dear All,

Please find Qualcomm's views in the attached document.

Thank you.
BR, -Nitin--

At 09:45 AM 6/23/2020, Timo Roman wrote:

Dear All,

Please find views from Nokia and Nokia Siemens Networks in the attached document.

BR,

Timo Roman

-----Original Message-----
From: Huang, Feng Chen [Feng-Chen.Huang [mailto:feng-chen.zhong=ALCATEL-LUCENT.COM]]
Sent: 16 June 2020 12:08
To: 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG
Subject: Re: [01.03.120.A] Email discussion on PDSCH matting for CSI/RS design

Dear all,

Please find Alcatel-Lucent and Alcatel-Lucent Shanghai Bell's view in the attachment.

Best Regards,
Feng Chen Huang
Wireless Research
NB, Nova II street Feng.Chen.Chong@alcatel-lucent.com

-----Original Message-----
From: HOSHINO, Masayuki [mailto:hoshino.masayuki@JP.PANASONIC.COM]
Sent: Tuesday, June 16, 2020 3:39 AM
To: 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG
Subject: Re: [01.03.120.A] Email discussion on PDSCH matting for CSI/RS design

Dear Alex-san, all,

Thank you very much for triggering the e-mail discussion on PDSCH matting for CSI-RS design.
Attach includes Panasonic's view. Please find it.

Regards,
Hoshino (Panasonic)

> Dear Alex-san and all,
>
> Thanks for initiating the discussion on PDSCH matting for CSI-RS design.
> Please find attached the word document with Samsung's views on the issue.
>
> Thanks,
>
> Younsun.
>
> _____
> Younsun Kim, Ph. D.*
> Senior Engineer*
> Samsung Electronics Co., Ltd.*
>
> Office: +82-31-279-5894
> Mobile: +82-10-2876-2389
> E-Mail: ** younsun.kim@samsung.com <mailto:younsun.kim@samsung.com>*
> _____

> *From:* Hao-chi, Alex<mailto:alex.hao-chi@ITRI.ORG.TW>
> *Sent:* 15 June, 2020 [illegible] 10:48
> *To:* 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG
> *Subject:* Re: [01.03.120.A] Email discussion on PDSCH matting for CSI/RS design
>
> Dear all,
>
> Please find initial opinions on some aspects of PDSCH matting for CSI-RS
> on the attached file.
>
> Alex
>
> _____
> *From:* Dayong Lee [mailto:dayong.lee@LGE.COM]
> *Sent:* 15 JUN, 2020 [illegible] 02:48
> *To:* 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG
> *Subject:* Re: [01.03.120.A] Email discussion on PDSCH matting for
> CSI/RS design
>
> Dear Alex-san, and all
>
> Thanks for the discussion on matting for removed CSI measurement. I
> have attached views of LG Electronics.
>
> Best Regards,
> Dayong Lee
>
> LG Electronics, Inc.
>
> *From:* Chandrasekhar, Vikram [mailto:vikram.chandrasekhar@TI.COM]
> *Sent:* Tuesday, June 15, 2020 6:45 AM
> *To:* 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG
> *Subject:* Re: [01.03.120.A] Email discussion on PDSCH matting for
> CSI/RS design
>
> Dear Alex-San
>
> Thank you for initiating the discussion on PDSCH matting aspects for
> inter-cell CSI measurements.
>
> Texas Instruments' views are presented in the attached file.
>
> Best
> Vikram Chandrasekhar

> _____
> *From:* Weidong Zhang [mailto:weidongz@HISILICON.COM]
> *Sent:* Monday, June 15, 2020 4:16 PM
> *To:* 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG
> *Subject:* Re: [01.03.120.A] Email discussion on PDSCH matting for
> CSI/RS design
>
> Dear all,
>
> We would like to share our view on PDSCH matting in the attached file.
>
> thanks,
> Weidong
>
> *Hisi-Lei <mailto:leijilei@HISILICON.C
> 2019-06-25 09:09
>
> Please respond to
> mailto:leijilei@HISILICON.COM
>
> To
>
> 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG
> cc
>
> Subject
>
> Re: [01.03.120.A] Email discussion on PDSCH matting for CSI/RS design

> _____
> *From:* Takeda, Kazuaki [mailto:kazuaki.takeda@NTTDOCOMO.COM]
> *Sent:* Thursday, June 18, 2020 8:49 AM
> *To:* 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG
> *Subject:* Re: [01.03.120.A] Email discussion on PDSCH matting for
> CSI/RS design

> Dear all,
>
> Thanks to Alex-San for triggering the email discussion!
>
> Please find Huawei's view on PDSCH matting for CSI-RS design as
> attached, which is added based on the version sent out by Hiki-San.
>
> BR/Best Lei
> -----Original Message-----
> *From:* Takeda, Kazuaki [mailto:kazuaki.takeda@NTTDOCOMO.COM]
> *To:* 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG
> *Sent:* Thursday, June 18, 2020 8:49 AM
> *Subject:* Re: [01.03.120.A] Email discussion on PDSCH matting for
> CSI/RS design

> Dear all,
>
> This is Nobuhiko Miki of NTT DOCOMO.
>
> Attached, please find DOCOMO's view on PDSCH matting for CSI/RS design.
>
> Best regards,
> Nobuhiko Miki

> _____
> *From:* Tetsushi Abe [mailto:abetetsushi@STTDOCOMO.COM] *
> *Sent:* Thursday, June 18, 2020 8:49 AM
> *To:* 3GPP_TSG_RAN_WG1@LIST.ETSI.ORG
> *Subject:* [01.03.120.A] Email discussion on PDSCH matting for CSI/RS
> design

> Dear all,
>
> As expressed by chairman, I would like to kick off an email discussion
> on PDSCH matting.
> Please share your opening topics not found in the attached document. Please
> provide your view on each topic.
>
> Thank you very much for your cooperation.
>
> BR
> Attached[attachment "Email discussion on PDSCH matting(DCM_0301).doc"
> deleted by YoutingZhang/CRT/Huawei]

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17 Krzhizhanovo Str., Bldg. 4, Moscow 121614,

Russian Federation

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recipient, please contact the sender and delete all copies.

HOSHINO Masayuki <hoshino.masayuki@jp.panasonic.com>
Senior Engineer, Panasonic Corporation, Panasonic Corporation
Phone: +81-45-938-3836 / Fax: +81-45-938-2187 <Updated since May. 21, 2020>

Content-Type: application/msword; name="Email discussion on PDSCH"
matting(DCM_0301_ETT_V2_INTC_SAMR_panu_A12_V0003).doc"
Content-Description: Email discussion on PDSCH
matting(DCM_0301_ETT_V2_INTC_SAMR_panu_A12_V0003).doc
Content-Disposition: attachment; filename="Email discussion on PDSCH"
matting(DCM_0301_ETT_V2_INTC_SAMR_panu_A12_V0003).doc"; size=39412;
creation-date="Mon, 15 Jun 2020 07:10:06 GMT"

LIST ETSI.ORG

Appendix J

3GPP_TSG_RAN_WG1 Archives
June 2010, Week 4

New in LISTSERV 17.0

3GPP_TSG_RAN_WG1@LIST.ETSI.ORG

Options: Use Proportional Font
Show Text Part by Default
Show All Mail Headers

Message: [<< First] [< Prev] [Next >] [Last >>]
Topic: [<< First] [< Prev] [Next >] [Last >>]
Author: [<< First] [< Prev] [Next >] [Last >>]

Subject: [RAN1#61bis] LTE<E-A contributions from CATT (batch 1)
From: Ding Yu <dingyu@DATANGMOBILE.CN>
Reply To: dingyu@DATANGMOBILE.CN
Date: Tue, 22 Jun 2010 13:11:54 +0800
Content-Type: multipart/mixed
Parts/Attachments: text/plain (2512 bytes) , text/html (37 kB) , R1-103465.zip (53 kB) , R1-103466.zip (224 kB) , R1-103467.zip (64 kB) , R1-103469.zip (93 kB) , R1-103470.zip (32 kB) , R1-103471.zip (22 kB) , R1-103472.zip (84 kB) , R1-103473.zip (44 kB) , R1-103474.zip (423 kB) , R1-103475.zip (22 kB) , R1-103476.zip (24 kB) , R1-103477.zip (23 kB) , R1-103478.zip (43 kB) , R1-103479.zip (53 kB) , R1-103480.zip (51 kB) , R1-103481.zip (112 kB) , R1-103482.zip (268 kB) , R1-103484.zip (38 kB) , R1-103485.zip (38 kB) , R1-103486.zip (91 kB) , R1-103487.zip (207 kB) , R1-103488.zip (61 kB) , R1-103489.zip (284 kB) , R1-103490.zip (341 kB)

Dear all,

Enclosed are LTE&LTE-A contributions batch 1 from CATT for RAN1#61bis meeting.

BR,

Ding Yu

Agenda Item	Type	Tdoc Number	Title	Source
6.2.2	Discussion/Decision	R1-103465	PHICH collision in LTE-A	CATT
6.2.3.1	Discussion/Decision	R1-103466	PDCCH search space design in LTE-A	CATT
6.2.3.2	Discussion/Decision	R1-103467	Discussion on remaining issues for CIF in LTE-A	CATT
6.2.4.1	Discussion/Decision	R1-103469	UL ACK/NAK transmission for TDD with CA	CATT
6.2.4.1	Discussion/Decision	R1-103470	DAI Design for LTE-A	CATT
6.2.4.2	Discussion/Decision	R1-103471	PUCCH Format 1/1a/1b Resource Allocation with SORTD	CATT
6.2.4.1	Discussion/Decision	R1-103472	ACK/NAK bundling for FDD with CA	CATT
6.2.4.1	Discussion/Decision	R1-103473	PUCCH resource allocation for CA	CATT
6.2.4.3	Discussion/Decision	R1-103474	CQI feedback for LTE-A	CATT
6.2.5	Discussion/Decision	R1-103475	Discussions on remaining details for LTE-A UL PC	CATT
6.3.3.1	Discussion/Decision	R1-103476	Control signaling for DL MIMO	CATT
6.3.3.2	Discussion/Decision	R1-103477	Discussion on the use of DMRS ports/ scrambling sequences	CATT
6.3.4	Discussion/Decision	R1-103478	Control signaling design for dual-codebook operation	CATT
6.3.4	Discussion/Decision	R1-103479	Further investigation on 8Tx codebooks	CATT
6.3.4	Discussion/Decision	R1-103480	Multi-granularity codebooks for 4Tx DL MIMO	CATT
6.3.4	Discussion/Decision	R1-103481	Discussions on dual-codebook feedback framework	CATT
6.3.1.2	Discussion/Decision	R1-103482	Further investigation on DMRS design for extended CP	CATT
6.4.1	Discussion/Decision	R1-103484	Further discussion on signaling of UL MIMO	CATT
6.5.1.1	Discussion/Decision	R1-103485	UL DMRS configuration with OCC	CATT
6.5.2.1	Discussion/Decision	R1-103486	On aperiodic SRS transmission in LTE-A	CATT
6.6.1	Discussion/Decision	R1-103487	Considerations on Relay Backhaul Control Channels in LTE-A	CATT
6.6.1	Discussion/Decision	R1-103488	R-PDCCH design in LTE-A	CATT
6.6.1	Discussion/Decision	R1-103489	Design of DMRS for Backhaul link in LTE-A	CATT
6.6.1	Discussion/Decision	R1-103490	Performance evaluation of R-PDCCH with CRS in LTE-A	CATT

ONEPLUS EXHIBIT 1009
Page 347 of 349

Appendix K

Subject: Samsung contributions - batch 3
From: Joonyoung Cho <joonyoung.cho@SAMSUNG.COM>
Reply To: Joonyoung Cho <joonyoung.cho@SAMSUNG.COM>
Date: Tue, 22 Jun 2010 21:04:09 +0900
Content-Type: multipart/mixed
Parts/Attachments: text/plain (958 bytes) , text/html (26 kB) , R1-103639.zip (78 kB) , R1-103640.zip (98 kB) , R1-103652.zip (61 kB) , R1-103655.zip (141 kB) , R1-103657.zip (145 kB) , R1-103658.zip (92 kB) , R1-103659.zip (170 kB) , R1-103661.zip (57 kB) , R1-103662.zip (22 kB) , R1-103669.zip (296 kB) , R1-103670.zip (19 kB) , R1-103671.zip (32 kB) , R1-103672.zip (74 kB) , R1-103674.zip (21 kB) , R1-103681.zip (40 kB) , R1-103646.zip (198 kB) , R1-103646.zip (198 kB)

Dear all,

Attached please find Batch 3 of Samsung contributions:

6.2.4.1	R1-103639	DAI design for LTE-A TDD
6.2.4.1	R1-103640	Discussion on ACK/NACK transmission method for LTE-A TDD
6.2.5	R1-103646	Power control for UL SU-MIMO
6.2.8	R1-103652	Aperiodic CQI activation in CA
6.3.2.1	R1-103655	Discussions on CSI-RS design
6.3.2.2	R1-103657	Discussion on the overhead of muting
6.3.2.2	R1-103658	Study on efficient power usage of muted off REs for CSI-RS
6.3.2.3	R1-103659	Study on periodic feedback of PMI/CQI responding to CSI-RS
6.3.3.1	R1-103661	Discussion on PDCCH capacity considering MU-MIMO
6.3.3.1	R1-103662	Compact DCI Design for MU-MIMO
6.3.5	R1-103669	TX diversity on MBSFN subframe
6.3.5	R1-103670	DL transmission modes for Rel-10
6.4.1	R1-103671	Further Discussions on UL MIMO signaling requirements
6.4.1	R1-103672	Re-using DCI format0 for UL SU-MIMO retransmission
6.4.1	R1-103674	PMI signaling in DCI format for UL MIMO
6.6.1	R1-103681	R-PDCCH interleaving in CRS mode

Kind regards,
Joonyoung