

Filed on behalf of Western Digital Technologies, Inc.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WESTERN DIGITAL TECHNOLOGIES, INC.,
Petitioner,

v.

GODO KAISHA IP BRIDGE 1,
Patent Owner.

Case No. IPR2024-01494
U.S. Patent No. 11,968,909

**PETITIONER'S OBSERVATIONS ON CROSS-EXAMINATION OF
CAROLINE A. ROSS, PH.D.**

Petitioner Western Digital submits the following observations on the December 11, 2025 cross-examination testimony of Dr. Caroline A. Ross (EX1107), as authorized by the Board’s October 27, 2025 email. *See* EX3001.

OBSERVATION 1:

In Exhibit 1107, on pages 37:18-38:5, the witness testified that Butler is “choosing the appropriate conditions to model bulk iron, which includes the Fermi level.” The testimony is relevant because it contradicts Dr. Ross’ testimony that skilled artisans, in order to be motivated to explore lower barrier heights, needed to recalculate density of states at different Fermi energies using Butler’s mathematical model which it purportedly could not accommodate because Fermi energy was not an input to the model but rather a value calculated by it: “Butler did not choose a Fermi energy level—he calculated it from the model,” EX2087 ¶ 14, and “Butler nowhere teaches moving the Fermi energy (he took great pains to accurately calculate it in the first place),” *id.* ¶ 8; *see also* EX1107 at 36:7-37:2, 38:6-13, 39:15-40:2.

OBSERVATION 2:

In Exhibit 1107, on pages 24:16-25:18, the witness testified:

Q. Okay, Dr. Ross, so we were at paragraph 90 in Exhibit 2053, your original declaration. Do you recall that?

A. Yes.

...

Q. Okay. In that first sentence, you express the opinion that the largest conductance in the majority spin-up channel should be via Delta 1 state tunneling due to two things, first, the large densities of states of majority Delta 1 states in iron(100) and, second, ..., correct?

A. That is what it says.

Q. Okay. Why does the large density of states of majority Delta 1 states in iron (100) indicate that the largest conductance... should be via Delta 1 state tunneling?

A. Well, the conductance occurs by electrons tunneling, and that's where electrons are in that Delta 1 state.

The testimony is relevant because it contradicts Dr. Ross' testimony that skilled artisans would not have been motivated to shift the Fermi level (altering the density of states and barrier height) in order to increase TMR because "[a] POSA would not have viewed the majority and minority density of states in Butler's Figure 3 as 'a proxy for electrical conduction'...." EX2087 ¶ 11; *see also id.* ¶ 8.

OBSERVATION 3:

In Exhibit 1107, on pages 42:21-43:8, the witness testified:

Q. ... You would agree that Giordano was able to calculate densities of states and Fermi level after adding oxygen vacancy defects to magnesium oxide..., correct?

...

A. Well, that's what figure 3 is showing according to Giordano.

The testimony is relevant because it contradicts Dr. Ross’ prior testimony that skilled artisans needed to, but would not have been able to, model the effects of oxygen vacancy defects in MTJs in order to be motivated to explore lower barrier heights: “Modeling an Fe/MgO interface with oxygen vacancy defects would have been far more difficult and would have been well beyond the capabilities of a POSA.” EX2087 ¶ 16; *see also* EX1107 at 41:18-42:4.

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Dated: December 22, 2025

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CERTIFICATE OF SERVICE

The undersigned certifies that pursuant to 37 C.F.R. § 42.6(e), a true copy of the foregoing **PETITIONER’S OBSERVATIONS ON CROSS-EXAMINATION OF CAROLINE A. ROSS, PH.D.** is being served electronically on December 22, 2025 to the following counsel for Patent Owner to the following email addresses:

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