

Reviewer A Comments

For author and editor

Just a few minor comments for your consideration:

1. Line 18: "very-long" -> very long
2. Should there be a "Data and Code Availability Statement" that says no data/code is used?
3. Include doi for the references when available

Reviewer B Comments

For author and editor

The report is well written. I have a few small suggestions. First, adding year 2025 in line 27, 32, and 36 when referring to the three publications might be helpful. Second, it is strange to say an average of 3-5 m in line 35. Is it what the Melgar paper said? Did they give a more specific number, like 3.4 m? Third, the paragraph between line 51-55 is difficult to read for me. Maybe just saying that the supershear speed and involvement of multiple sub-events contributed to the remarkably long rupture. Then say other details related to these two factors.

Response to Reviews

Reviewer A

Just a few minor comments for your consideration:

Comment 1. Line 18: "very-long" -> very long

Response: Done.

Comment 2. Should there be a "Data and Code Availability Statement" that says no data/code is used?

Response: We have now included the Data and Code Availability section as follows:

“No data or code was used.”

We also included the Acknowledgment section as follows:

“We appreciate the careful reading and helpful suggestions by Andrea Llenos and an anonymous reviewer.”

Comment 3. Include doi for the references when available

Response: Done.

Reviewer B

The report is well written. I have a few small suggestions.

Comment 1: First, adding the year 2025 in line 27, 32, and 36 when referring to the three publications might be helpful.

Response: Done

Comment 2: Second, it is strange to say an average of 3-5 m in line 35. Is it what the Melgar paper said? Did they give a more specific number, like 3.4 m?

Response: Thanks for pointing this out. Melgar et al. reported a depth-averaged slip of 3-5 m. We have updated the sentence as follows:

“Their model suggests that the total rupture extended 450 km, with depth-averaged slip in the range of 3 to 5 m.”

Comment 3: Third, the paragraph between lines 51-55 is difficult to read for me. Maybe just saying that the supershear speed and involvement of multiple sub-events contributed to the remarkably long rupture. Then say other details related to these two factors.

Response: Thanks for the suggestion. We have now modified the paragraph as follows:

We find that different reports consistently describe this event as having an unusually long rupture. Based on the reported findings, we speculate on two possible contributing factors: (1) supershear rupture speed, and (2) the occurrence of multiple distinct sub-events within the overall rupture. Supershear rupture may have contributed to sustaining the extensive rupture propagation, assuming favourable conditions such as high pre-stress, a long and straight fault geometry, and conducive crustal properties. As for the distinct sub-events, they reportedly spanned approximately 120 km, 150 km, and 200 km, with varying degrees of spatial overlap. Their sequence and interaction may have collectively produced the exceptionally long rupture.