

Interactive comment on “New Study on the 1941 Gloria Fault Earthquake and Tsunami” by M. A. Baptista et al.

Anonymous Referee #1

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The NHESS paper “New Study on the 1941 Gloria Fault Earthquake and Tsunami” by Baptista et al. provides a new interpretation of this important historical earthquake by analyzing seismograms and tide gauge records. The tide gauge records, in particular, are inverted in terms of both travel-times and waveforms, using state-of-the-art techniques. This study places the earthquake in a new location compared to several other older analyses, although on the same section of the Gloria fault as the analysis of Gutenberg and Richter (1949).

This is a straightforward and clearly presented study. I only have three general, substantive comments indicated below:

- The technique to locate the epicenter from the seismograms needs more description. In particular, what is the method behind “Hypocenter” code running under SEISAN

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environment” (P60)? In addition, it would be very useful to the reader if a waveform comparison of the seismograms is presented in a figure. Displaying the newly-acquired historic seismograms would also be very interesting.

- Could the significant topography surrounding the Gloria fault also play a role in tsunami generation, in terms of horizontal movement? This was discussed by Ishii et al. [2013] in an analogous study of the 2012 Mw 8.6 Indian Ocean event, with regard to displacement of the Ninety-East Ridge.

- Is the apparent rotation of the inverted displacement field shown in Fig. 5 caused by the azimuthal distribution of tide gauge stations or some other artifact of the inversion?

Specific technical comments are indicated below:

- It would be helpful to show the fault trace for the Gloria fault on Fig. 1, as well as how it is segmented. Also, I cannot discern the 1st motion polarities on the focal mechanism in Fig. 1 (e.g., the “BC segment”).

- P45: “. . .new set of old seismograms” better phrased as “. . .newly acquired set of historic seismograms”.

- P65: What is the Dineva et al. (2002) approach? Please describe in the manuscript.

Reference

Ishii, M., E. Kiser, and E. L. Geist (2013), Mw 8.6 Sumatran earthquake of 11 April 2012: Rare seaward expression of oblique subduction, *Geology*, 41, 319-322.

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