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Discussions

Interactive comment on "Source of the 6 February 2013 M_w 8.0 Santa Cruz Islands Tsunami" *by* F. Romano et al.

Anonymous Referee #2

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The manuscript by Romano et al is well written. The authors used tsunami waveforms to estimate slip distribution on a 3-D plate interface. The tsunami waveform inversion that they used is scientifically sound and they implemented the method with high discipline (i.e. using highest freely available bathymetric and topographic data, doing checkerboard test). This study shows that the main slip region is located south east of the epicenter, which was absent in a previous slip inversion study using teleseismic waveforms by Hayes et al. (2014). I have only minor comments for the manuscript

1) Fritz et al., (2014) reported a maximum tsunami run-up of 11 m (mentioned in page 1951, 5, and page 158, 10). I wander how high is the simulated tsunami run-up (or coastal tsunami height) from the author's source model. Can their source model explain the observed run-up?

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2) The discussion section is very long compare to other sections. The discussion section will be much easier to read if the authors divided it into subsections.

3) Page 1956: In principle, teleseismic data well constrain the earthquake seismic moment and the seismic rupture history, and, compared to tsunami data, they are less sensitive to the spatial details of the slip distribution (e.g. Yue, 2014). Page 1958: Thus, despite of the differences among the models, and even though tsunami data are not particularly suitable to resolve the details of the seismic rupture history, our source model, at least at the first order, is in agreement with the moment rate functions resulting from studies that used teleseismic data. Another reference can be added, Gusman et al. (GRL, 2015) shows that teleseismic data provide stable moment rate function while tsunami data provide stable spatial slip distribution.

Reference: Gusman, A. R., S. Murotani, K. Satake, M. Heidarzadeh, E. Gunawan, S. Watada, and B. Schurr (2015), Fault slip distribution of the 2014 Iquique, Chile, earthquake estimated from ocean-wide tsunami waveforms and GPS data, Geophys. Res. Lett., 42, doi:10.1002/ 2014GL062604. âĂĺ

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