



# ***Interactive comment on “The effect of uncertainty in earthquake fault parameters on the maximum wave height from a tsunami propagation model” by D. Burbidge et al.***

## **Anonymous Referee #2**

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The manuscript of Burbidge et al. presents a very useful methodological study addressing the role of source parameter uncertainties in the computational-based tsunami hazard analysis and early warning. By means of systematic processing of huge number of scenarios from simple to more complex numerical setups, Authors provide a comprehensive view on the highly heterogeneous uncertainty propagation over the whole computational domain. These results are of key importance for methodological progress in PTHA as well as early warning.

I recommend publishing the Manuscript with some minor corrections. In particular:

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3371:1-3: When listing physical parameters influencing the tsunami wave field, one should, probably, start not with tides and dispersion but with source parameters and bathymetry since these are most important.

3371:15: Remove reference to Davis et al. (2015) – paper is only “in preparation”.

3371:last line: remove comma after “epistemic”; same for 3387:27

3372:16: explain abbreviation “SD” (=standard deviation)?

3372: Eq.1: should be power 2 for the difference under the root

3373:13: “affected” instead of “effected”?

3374: At the very end of the Section 1, after Authors have formulated the two main questions: I'd like to read something about their interpretation of these questions. Why do they ask these questions? Why these are important? In particular, if the first question is answered with “no”, what does it mean for PTHA (or source inversion, or forecasting)? Similarly, what “normal distribution of hmax” would mean in the same context?

3376:11: At this point it is not clear what is the longitude 181.25°. Because there is no reference to grid coordinates in the text. Authors only report grid size (80°X80° or 80°X42°). One can see from the figures (e.g., Fig.4) that the grid ranges from 140° to -140° by longitude. However, not from the text.

3376:13: Instead of “step” in bathymetry, I would say “reflecting wall” (would be easier to understand the model setup).

3379:11: remove “NetCDF files”. Should be: “... a mix of Golden Software format produced by EasyWave and ...”

3379:11: Golden Software, probably, should be referenced or copyright symbol must be used.

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3377:23: If a single fault model with uniform slip distribution and plane rupture was used all the times – what was the reason to discretize sources into 10km x10km subfaults? Why not just taking one single patch with given length, width and slip?

3381:16-18: Interpretation for the minor assymetries? Limited length of random samples (N=100)?

Sections 3.2.x: Authors are very laconic in their description of effects of individual parameters. Actually, they only refer to the Figures. In particular, they do not provide any interpretation at this point, postponing it to the Discussion. However, I think, some minimal interpretation would be nice to have also at the end of each section. At least, at the end of section 3.2.1 (Strike), after describing Figures 4 and 5. In particular – what do these Figures tell us in context of PTHA, forecasting, etc.?

3386:25: I suggest to remove word “probably” cause there is no any other option. All these parameter variations do nothing more as changing the initial deformation pattern.

3391:6:Reference: I suggest using following reference to easyWave: <http://trac.gfz-potsdam.de/easywave>

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 3369, 2015.

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