Natural Hazards
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Discussions

Interactive comment on "Synthetic Tsunami Waveform Catalogs With Kinematic Constraints" by Maria Ana Baptista et al.

Anonymous Referee #1

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Overall

The authors studies the faultiness close to the Iberia peninsula, in order to estimate the tsunami waveforms that could attack the western coasts of Portugal, Spain and Morocco. Generally, their approach appears interesting, yet there are a number of issues that need to be clarified before the paper can be accepted for publication.

Major comments

-It is surprising that no mention is made at all in this paper to the historic Lisbon earthquake and tsunami. Such a major event, and its relation to plate tectonics, should at least be mentioned somewhere in the introduction.

-In section 2 the authors describe three tsunamigenic earthquakes. However, they pro-

vide no indication concerning the records of the inundation heights, etc. This would be of major interest to any readers. Later, the authors state "These results are compatible with the maximum observed amplitudes of the 25th November 1941 tsunami (Baptista et al., 2016)." What exactly are these amplitudes, and exactly how well do they compare?

-Figure 2 is of very poor quality. It is almost impossible to understand what the authors are referring to regarding the dots (this reviewer has very good eyesight, yet had to put his eyes almost an inch away from the screen to notice anything). The authors could use a different colour (maybe red?) for the dots, and clearly label the segments on the figure?

-P7L4 "The model ran 7200 time steps," How long was this in hours? It would be interesting for the authors to show at least one example of the time history of the wave profile at one point along the coastline (say Lisbon or Cadiz, for the worst inundation height) Otherwise, it is difficult to verify how well the author's model is working.

-Why did the authors choose to show the tsunami amplitude at the 30m line? Somehow, this reviewer would have expected the authors to verify that the model they are using can provide realistic inundation heights, at least at one location. Otherwise, how can they really claim that their model reproduces well historical events (essentially, this is an issue of calibration and verification of their model)

-Discussion. It is difficult to accept the hazard analysis presented by the authors, as they only estimated the tsunami wave heights at a depth of 30m. Also, it is strange to talk about sea level rise for the case of tsunamis, and difficult to sea how this would have a great influence, unless the authors are talking about the end of the 21st century (even then. . .)

Minor comments

-L15 "we can expect wave heights between 0.6m and 0.8 m requiring the evacuation of

coastal areas." , Normally such small heights would produce little to no damage (based on other events). Obviously the coastline should be evacuated, just in case. . .

- "The computation of tsunami waveforms along the coast is a time-consuming process that requires substantial computational resources." Is this really the case nowadays? Somehow it does not feel that the resources needed are that substantial any more, but it could be that this reviewer is used to how things were over a decade ago. . .

-In the present work the authors assume a uniform slip. This is a common assumption, though at present some other authors have started to use non-uniform slips. Maybe this can be briefly discussed? Could non-uniform slips result in higher tsunami amplitudes?

-P7L16 This phrase is unclear "Because we ran a linear approach and the depths of the different points of interest are variable," What do the authors mean by "we ran a linear approach"? P8L32 "Finally, it is worth pointing out that the instrumental observations in the XX century correspond to the realization of low frequency seismic and tsunami events." It is not clear what the authors mean. Also, note that mentioning records of only one century with regards to tsunami events is potentially dangerous.

Grammar, typos

Generally speaking the language is ok, though at times there are problems with some sentences. Below in an non-exhaustive list of problems found by this reviewer while going through the document.

L5 "known as the Gloria fault"

L8 "a time span of 20,000 years" (is this what the authors are trying to say?)

L29 "Tsunami have several characteristics that differentiate it from other natural hazards." Maybe "Tsunami waves have several characteristics that differentiate them from other types of natural hazards"

L31 "Moreover, it is not possible to describe tsunami propagation using an "attenuation" law-like," this is confusing, please improve/rephrase this sentence.

P3L1, delete the comma after "event"

P3L8 please use 20,000 years (this reviewer prefers this notation, and in any case there should be a space between k and years)

P3L21 "age difference, between a younger" delete comma after difference

-P5L12 and following. All parameters in the paper must be in italics. Please check these and the entire paper again

-P7L19 change to "the corresponding wave heights at 30 m water depth.

-P8 L4 "Along the South Portuguese coast, from Vila do Bispo to Vila Real de Santo António." Incomplete sentence