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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "A sanity check for earthquake recurrence models used in PSHA of slow deforming regions: the case of SW Iberia" *by* Margarida Ramalho et al.

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This paper is headed in the right direction, but only makes a tiny amount of progress. The key issue is stated in very hesitant terms in lines 43-45, namely: "One of the evolutions suffered by PSHA studies and now recognized as essential, is the evaluation of the uncertainties on the results (e.g. Frankel, 2004, Stein et al., 2012, Mulargia et al., 2017), being a consequence of our incomplete knowledge of the earthquake generation and propagation mechanisms." The question though is whether this uncertainty

can be dealt with within the PSHA framework (this seems to be the authors' position) or whether the entire PSHA framework is fundamentally flawed and should be abandoned (this is the position of Mulargia et al., 2017, with which, as a co-author, I agree with). If one agrees there is, at present, no scientific basis for selecting the earthquakes to be fed into PHSA as the input, then the output of PSHA will just be a bunch of numbers, with no physical validity. I'd like to see the authors confront and discuss this issue head-on in their revised paper.

Using the published hazard maps to conduct a "sanity check" is one way to show the existence of problems and inconsistencies, and I support the eventual publication of this work, but it seems to me that this was a fully expectable result, given that (as I understand it) the hazard maps were constructed by assuming that future seismic activity would be the same as past seismic activity.

Seth Stein wrote a book about this problem "Disaster Deferred: A New View of Earthquake Hazards in the New Madrid Seismic Zone" (2010, Columbia University Press). You can find references to some of his papers on New Madrid in that book. I think the Frankel (2004) paper you cite (lines 762-763) is basically a reply to arguments by Stein. It might be useful for you to discuss that controversy in more detail in your paper, as the basic issue seems to be similar to the one involved in hazard maps for Portugal.

It will take a long time for the hazard estimation community to figure out how best to deal with problems of the type discussed in this paper. I hope the authors' revision is done in a way that they address the underlying issues in more depth, and more profoundly.

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