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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Real-time probabilistic seismic hazard assessment based on seismicity anomaly" *by* Yu-Sheng Sun et al.

Anonymous Referee #2

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In this paper the authors develop a Real-time Probabilistic Seismic Hazard Assessment using a time dependent probability model (Pattern Informatics) as seismic source. For the calculation of the earthquake ground motion the authors use the attenuation laws produced and published by Lin et al. (2012). The methodology was applied in Taiwan, during the occurrence of two strong earthquakes in 2016 (Meinong) and 2018 (Hualien). In the first part of the paper the authors describe their approach on seismic hazard assessment and they explain, in a general way, the PI model used, the real-time PSHA and the procedures for verifying the performance of the results. In the second part the authors analyze the results obtained with the proposed methodology and compare them with the ground motion data recorded from the P-alert network. They conclude that, in future, the use of this method could be an important tool to esti-

mate PGA distribution to prepare us for earthquake disasters. The article is satisfactory and the methodological approach is described partially in the text, the other theoretical part about the PI model is delegated to other articles published by different research groups. I suggest that the paper must be publish with minor revision. I suggest only the following comments about the paper: 1) The paper, before publication, must be read by a native English speaker who will correct the English grammar; 2) It is important to describe the PI method so that the reader, who does not know the methodology, can understand the content of the paper; 3) The ROC diagram allows to quantify the goodness of one model with respect to another that is taken as a reference. In the case analyzed in the text the PI model gives a better performance than a Poissonian model and a random one. This result could be taken for granted because when using a seismicity information in a model, this leads to a better performance than very simple models. An interesting evaluation could instead be made using new test methods implemented for earthquake forecast models in the CSEP (Collaboratory for the Study of Earthquake Predictability) to understand the behavior of the model in space, number of earthquakes and so on. In Figure 1(b), for example, is evident a zone (9 cells) with the highest probability (equal to one) but with no associated hotspot. This area is not present in Figure 3, perhaps because, I think, it falls into the sea. How do you explain that these values do not affect the performance of your model? Why do you use only the ROC diagram and have not used others methods that provide important information about the performance of your model?

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