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

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The authors would like to thank RC2 for the important suggestions, and we would add the PI description and do English editing before publication. We respond to the RC2's questions below.

1. The description of the PI method.

Please refer to AC1: 'reply RC1: 'Comments' and its Supplement.

2. How do you explain that these values (the zone (9 cells) with the highest probability) do not affect the performance of your model?

We separated the probability distribution of Hualien earthquake (Fig. 1) to examine

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the affection from the zone. In Fig. 2, we can clearly see the real-time PSHA results corresponding to Fig. 1. When we remove the zone (Fig. 1b), the seismic intensity just slightly decreases in the southeast coast area and southern Taiwan, and the high intensity area in southeast ocean disappears (Fig. 2b). Moreover, the seismic intensity estimated by the GMPE rapidly attenuates from the zone and there is no influence in the northeast area in the estimation of seismic intensity. Thus, although the zone contributes the affection of seismic intensity, it is not significant on land or even negligible.

3. Why do you use only the ROC diagram and have not used others methods that provide important information about the performance of your model?

The ROC test already discusses and verifies the relationship between the space distribution of the forecasting probabilities and number of earthquake events. Under the concept of dichotomy, it is intuitive to shows what the ratio of target earthquakes are hit under the certain percentage of the area of probability distribution. In the calculation, the relationship between the spatial location of the earthquake and the probability distribution is examined. The increased ratio in y-axis represents the ratio of hit target earthquakes, and the shifting in x-axis represents the percentage of the area of probability distribution. Moreover, ROC test would give an absolute value from 0 to 1, not a relative evaluation, which is much intuitive and decisive to show the performance. Therefore, we chose it to test our results. On the other hand, there are still other testing methods presenting the performance. If our goal is to compare the performance between the forecast models, we should be under the same forecasting conditions and test methods to examine that. In our case, we focus on the concept and the calculating process of real-time PSHA so that we simply show that the forecasting results are good enough to be a probability function in the real-time PSHA calculation.

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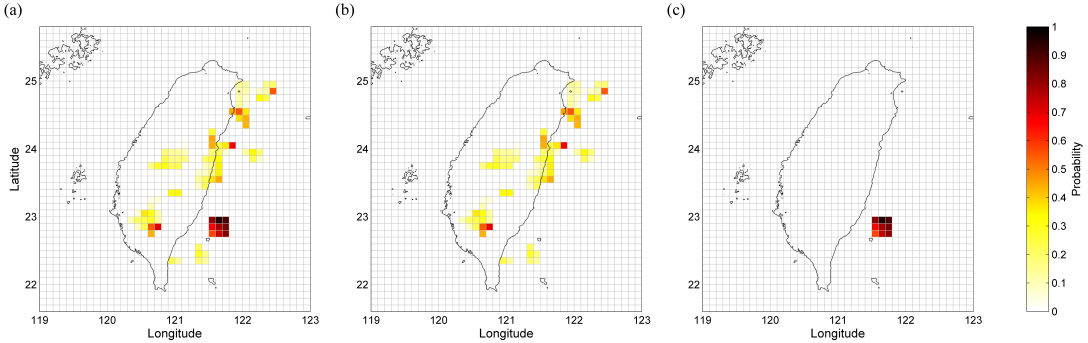

Fig. 1. Disassembled probability distribution. (a) Forecasting probability map of the Hualien earthquake from the PI. (b) Remove the zone (9 cells). (c) Only the zone (9 cells).

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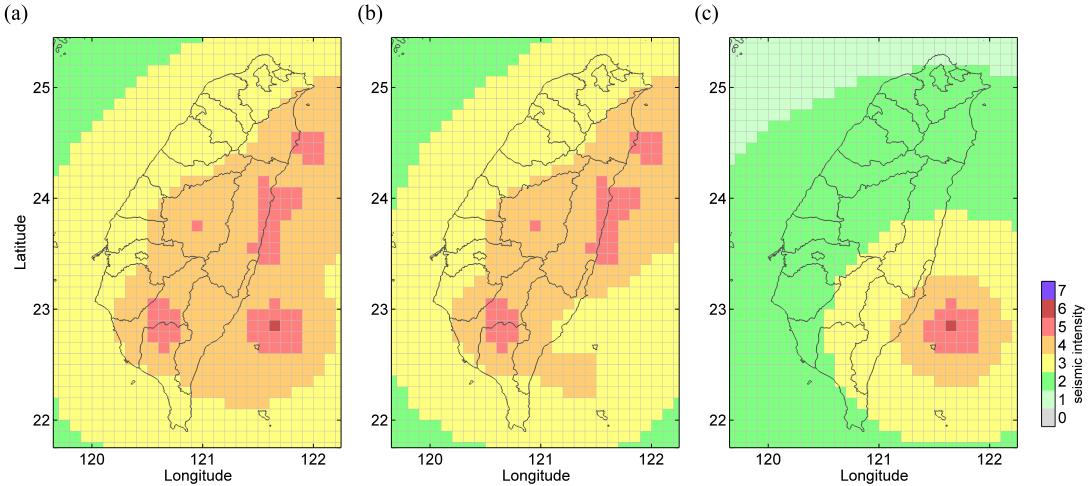

Fig. 2. Seismic intensity forecasting maps corresponding to Fig. 1. (a) Map of forecasted maximum seismic intensity for Hualien earthquake (b) The result of Fig. 1(b). (c) The result of Fig. 1(c).

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