

A study on evaluation formulae of the principal fault in PFDHA- In consideration of a relevance to known active faults-

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Takao et al. (2013) proposed some evaluation formulae for probabilistic fault displacement hazard analysis (PFDHA) based on data on surface earthquake faults in Japan.

As for the formulae in terms of the principal fault, Takao et al. (2013) did not discriminate between (1) an earthquake that occurred in an area where an active fault exists, and (2) an earthquake that occurred in an area where no cumulative deformation or active fault exists, in the same way as Youngs et al. (2003).

In this study, we re-examined the aforementioned evaluation formulae by discriminating between (1) and (2) for the 107 hypocenters described in Takao et al. (2003).

The results show that the differences in the $P1p$ between (1) and (2) are distinct and that the $P1p$ is closely correlated to the distance between the active fault and the hypocenter, so discrimination between (1) and (2) is useful for these evaluation formulae.

Therefore, it is suggested that the results of this study can be a powerful tool for applying the idea of diffuse seismicity in the probabilistic seismic hazard analysis (PSHA) to the PFDHA.

There are some differences in the evaluation formula for the fault displacement between (1) and (2), whereas it was confirmed that there is no clear correlation between the threshold value (boundary between (1) and (2)) and the predicted displacement using the regression equation.

We strongly recommend that these evaluation formulae should be examined in future by gathering more data on surface earthquake faults because the present data may be insufficient to consider the correlation between threshold value and fault displacement.

Keywords: PFDHA, probability of surface rupture of the principal fault, fault displacement, a relevance to an active fault

