# Study on occurrence probability of distributed faults in PFDHA

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A probabilistic fault displacement hazard analysis (PFDHA) is a methodology that assesses the annual rate at which an amount of displacement of a surface earthquake fault exceeds a certain quantity. According to Safety Standard No. SSG-9 that was published by the International Atomic Energy Agency (IAEA) in 2009, it is recommended to perform a PFDHA for existing nuclear power plants in case there is a capable fault at the site.
Although Youngs et al. (2003) proposed PFDHA evaluation formulae in the USA, no study on PFDHA had been done in Japan. Therefore, Takao et al. (2013) proposed evaluation formulae in terms of both principal and distributed faults based on data from surface earthquake faults generated by reverse and strike-slip faults in Japan.
In addition, Takao et al. (2014) proposed alternative evaluation formulae by conducting model experiments and numerical analyses based on the discrete element method (DEM) in order to compensate for the lack of data regarding distributed faults.
As for the occurrence probability of a distributed fault, grid-size dependency was studied by Takao et al. (2014) and evaluation formulae were proposed. However, the range (distance from the principal fault) to be considered when analyzing the occurrence probability of a distributed fault has not been studied at all so far.
Therefore, we demonstrated parametric analyses which can clarify how the range, which is considered in the analysis of the occurrence probability of the distributed fault, impacts on the evaluation formulae. As a result of the study, a rough indication of the range could be proposed.
Finally, in our oral presentation, we will show future tasks to be addressed, such as improvement of the evaluation formulae reflecting the latest earthquakes such as the 2014 Nagano-ken Hokubu earthquake and 2016 Kumamoto earthquake.

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