

Investigation of off-fault displacement

*Naoto Inoue¹, Naoko Kitada¹, Yasuhiro Matsumoto², Tsutomu Takahama², Tonagi Masao², LUIS ANGEL DALGUER³, Kojiro Irikura³

1. Geo-Research Institute, 2. KOZO KEIKAKU ENGINEERING Inc., 3. Aichi Institute of Technology

Discontinuous distributed fault displacements occur around the primary surface rupture in the earthquake. Evaluation of off-fault displacement is important for mitigation of fault displacement hazards. There are two types of off-fault displacement in the view point of a prediction problem. The displacement does not occur only on the active fault, but also off the active fault. Petersen et al. (2011) introduced mapping accuracy for the strike-slip fault. We estimated the mapping accuracy of several Japanese earthquakes at distinct fault side, i.e. hanging-wall/foot-wall by measuring distances between active fault traces and primary surface ruptures. Based on estimation of the mapping accuracy of strike-slip fault, narrow bell-shaped displacement profile across the active faults was inferred. On the contrary, wide bell-shaped displacement profile was estimated and the center shifted to the foot-wall side, in the case of the reverse-fault. The other off-fault displacement is the displacement on the secondary faults. This type of displacement of reverse fault focuses on the hanging-wall. These differences are important to estimation of fault displacement hazard.

Acknowledgments: This research was part of the 2014-2016 research project ‘Development of evaluating method for fault displacement’ by the Secretariat of Nuclear Regulation Authority (NRA), Japan. A part of displacement data was used from Kagohara et al. (2007), which was partly supported by the Grant-in-Aid for Scientific Research (no. 17200053) by Ministry of Education, Science, Sports and Culture.

Keywords: fault displacement hazard, secondary fault