

A study on effects of uncertainty in fault width to strong motion evaluation for earthquakes in active faults

*Nobuyuki Morikawa¹, Takahiro Maeda¹, Asako Iwaki¹, Hiroyuki Fujiwara¹

1.National Research Institute for Earth Science and Disaster Prevention

The lower-depth of the seismogenic zone is estimated from hypocenter distribution of small earthquakes in the long-term evaluation of earthquakes in active faults by Earthquake Research Committee of Japan (ERCJ), but there is a possibility that the fault bottom becomes deeper than that when a large earthquake occurs. However, almost no knowledge how deep it is. Therefore the consideration of epistemic uncertainty in the lower-depth of the seismogenic zone, the fault width, is required in the strong-motion evaluation.

The magnitude of an earthquake changes with the fault width by using the method (A) of strong motion evaluation method "recipe" by ERCJ. On the other hand, the magnitude of an earthquake is determined from the fault length by using the method (B) of the "recipe". Therefore the magnitude of an earthquake does not change with the fault width, but the values of source parameters, such as slip and static stress drop, change because the relation between seismic moment and fault area vary in this case.

As mentioned above, dependence of fault width on outer- and inner-source parameters determined from the "recipe" is very complicated. In this study we examine calculations of strong ground motion for some models considering uncertainty of the lower depth of the seismogenic zone and compare the results. It is also necessary to consider the uncertainty in dip angle of the fault as the parameter related to the fault width, but we consider only uncertainty in the lower-depth of the seismogenic zone here.

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