Review and future problems on strong-motion evaluation for intraplate earthquakes

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The National Research Institute for Earth Science and Disaster Prevention (NIED) has carried on the special research project 'National Seismic Hazard Mapping Project of Japan' to support the preparation of the seismic hazard map in general view of the whole Japan, which is made by the Headquarters for Earthquake Research Promotion. As for intraplate earthquakes, the strong-motion evaluations for earthquakes in Itoigawa-Sizuoka tectonic line fault zones and Morimoto-Togashi fault zones have been published by the Headquarters for Earthquake Research Promotion. The hybrid method is adopted for the strong-motion evaluation of intraplate earthquakes. To evaluate strong-motion by using the hybrid method, we need information on underground structure and not only outer source parameters but also inner source parameters. In the strong-motion evaluation for earthquakes in Itoigawa-Sizuoka tectonic line fault zones, the parameters are set by using the 'Recipe for evaluation of strong ground motions from intraplate earthquakes'. One of the problems for setting parameters is to determine the location of asperities. For setting parameters, we adopt the hypothesis that an asperity exists just under the part of active fault where surface dislocation is large. If we have no information on the location of asperities, we consider many cases and show deviation of evaluation. Estimation for deviation of strong-motion evaluation is essential for not only scenario earthquake maps but also probabilistic seismic hazard maps.

The following problems have to be settled to improve the strong-motion evaluation for intraplate earthquakes.

(1) Estimation of inner source parameters as well as outer source parameters.

(2) Modeling of underground structures.

(3) Improvement of methodology for strong-motion evaluation, such as, a method for strong-motion estimation in the transition frequency range and an estimation method for very near region of a fault.

(4) Setting source parameters based on dynamic source models.