A study on probabilistic earthquake hazard analysis applying the fault rupture model

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Fault rupture model is applied to probabilistic earthquake hazard analysis of back ground seismicity. Using the fault rupture model, we can estimate not only characteristics of strong ground motion; e.g. PGA, PGV, but also waveforms.

Fault rupture models are randomly generated based on the recipe, and strong ground motions are calculated by using stochastic Green's function method with considering frequency dependent radiation pattern and response of layered structure. The resulting ground motions of M_J6.5 earthquakes are successfully compared with those by an empirical attenuation technique. Especially for near-source region, however, the proposed method gives more realistic ground motions than empirical method; e.g. rupture directivity effect.

In succession to the basic study, applications for various scales of earthquakes are conducted introducing b-value of seismicity. The advantage and disadvantage for applying fault rupture model to probabilistic earthquake hazard analysis are discussed.