Source process of the 1923 Kanto earthquake using a new 3-D seismic structure model and a curved fault plane model

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Reflection surveys of the Special Project for Earthquake Disaster Mitigation in Urban Areas (DaiDaiToku) project presented a new Philippine Sea slab model, which is shallower than the previous slab models (Sato et al 2005). We have investigated the source process of the 1923 Kanto earthquake assuming a single fault plane consistent with the new slab model (Kobayashi and Koketsu 2004, Sato et al. 2005). However, the survey in the Boso peninsula also shows that the Philippine Sea plate in the southern part of the Boso peninsula is subducting more steeply than the other areas, suggesting that a single fault plane model is in disagreement with the slab shape in the Boso peninsula. Furthermore, the curvature of the Philippine Sea slab near the base of the Izu peninsula is also suggested by the reflection surveys. Matsu'ura et al (1980) and Takemura et al. (1999) showed that one more fault plane near the base of the Izu peninsula is required to fit the geodetic and seismic waveform data. Thus, we assumed fault model with two and three planes (Kobayashi and Koketsu, 2005). However, since large difference in strike and dip angles among the faults makes overlap and gap large, we assumed small difference in strike and dip angles.

To overcome this problem, in this study we assume a curved fault model along the surface of a new Philippine Sea slab model (Baba et al. 2006), which is created taking into account the result of the DaiDaiToku project. We also calculate the Green's functions using 3-D seismic structure model, which includes the new Philippine Sea slab model and shallow sediment and basement model in Kanto region (Tanaka et al. 2006). If the fault model with a plane is assumed, a gap between the slab surface and fault can generate reflection waves, which is not generated by the curved fault model. The Green's functions are calculated by using a finite-element method with a voxel mesh (Koketsu et al. 2004). We will present the results using the integrated new model and method.