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Slip distribution of the 1703 Genroku earthquake by using a curved fault model

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Great earthquakes along the Sagami trough, where the Philippine Sea slab is subducting, have repeatedly occurred. The 1703 Genroku and 1923 (Taisho) Kanto earthquakes (M 8.2 and M 7.9,respectively) are known as typical ones, and cause severe damages in the metropolitan area. The recurrence periods of Genroku- and Taisho-type earthquakes inferred from studies of wave cut terraces are about 200-400 and 2000 years, respectively (e.g., Earthquake Research Committee, 2004).

After we adopted an updated fault plane model (Sato et al. 2005), which is based on a recent model of the Philippine Sea slab, the asperity around the Miura peninsula moves to the north. Sato et al. (2005) presented the shape in inland part, but less information in oceanic part except for the Tokyo bay. Kimura (2006) and Takeda et al. (2007) presented the shape in oceanic part. In 2008-2010, multi-channel seismic (MCS) survey have been done off Boso peninsula and in the Sagami bay.

In this study, we compiled these slab models, and developed a new curved fault model. Kobayashi (2010, JpGU) inferred the slip distribution of the 1923 Kanto earthquake from geodetic data by using this fault model. In the present paper we infer the slip distribution of the 1703 Genroku earthquake from the geodetic data inferred from studies of wave cut terraces .

The curved fault plane was divided into 56 triangle subfaults. Point sources for the Green's function calculations are located at centroids of the triangles. At the present stage, we assume a 1-dimensional seismic structure model. The Green's functions are calculated by the frequency-wavenumber method of Zhu and Rivera (2002). Our preliminary results shows that a large slip area appears beneath the southern part of the Boso peninsula, which is consistent with our previous studies.

Keywords: asperity, the 1703 Genroku earthquake