

Geophysical Model of Asperities in the Kanto Region

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The Kanto Region lies at the eastern end of the Nankai, Tonankai, and Tokai earthquake generation zones. The current understanding of the offshore geology around the Kanto Region is based on a wide range of sub-bottom profiles, single- and multi-channel seismic surveys, OBS seismicity observations and inversions for velocity structure, and an array of shallow coring (gravity and piston), dredge and grab, and submersible/ROV sampling efforts.

The result of this work indicates that there may be at least two major asperities beneath the Kanto Region, and that they slip on the order of every 200-400 years (Taisho asperity) and every 1500-2000 years (Genroku asperity). However, what is the shape and extent of the asperity (or asperities), and how do these shapes change around the Kanto Region is still unclear, since these asperities are thought to cause great earthquakes in the intermediate-depths (near 10-20 km) which are not nearly as intensely surveyed.

The shape and extent of the Philippine Sea (PHS) Plate and the Pacific (PA) Plate and the distribution of the source of plate earthquakes (asperities and/or slow slips) have been revealed by the interpolative prediction of the intermediate-depths via the reinterpretation of shallower (less than 5,000 m) strata and the results of tomographic and seismic monitoring data from deep subsurface (more than 20 km).

This paper discusses a structural model (Fig. 1) suggesting the geological provinces within the Okhotsk (OK) Plate formed during the subduction of the PA-PHS plates and an estimated distribution of Taisho asperity and slow slip event regions at the OK-PHS plate-boundaries.

