Objectives of monitoring in the Kanto Asperity Project

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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. In the east of the asperity, or east off Boso Peninsula, slow slip events have repeatedly occurred with the recurrence period of 5-7 years. We have submitted a proposal 'Kanto Asperity Project (KAP)' (707CDP) to IODP to characterize asperity and non-asperity regions.

We have submitted a proposal (707B) for geophysical monitoring in the Sagami Bay and off Boso Peninsula, as a component of the Kanto Asperity Project. In this paper, geophysical objectives in this project are summarized.

On source models, Namegaya et al. (2008 and this meeting) presented a slip distribution of the 1703 Genroku earthquake, Tabuchi et al. (2007) presented a fault models. Recently upper surface of the Philippine Sea slab in inland part was determined by Daidaitoku, but that in oceanic region have not been well determined yet. Recent source models assumed fault planes in such regions. Miura et al. (2008 and this meeting) acquired and analyzed multi-channel seismic survey data off Boso Peninsula, and estimated the upper surface of the Philippine Sea plate. Seismic tomography from data recorded by KAP network can cause a three dimensional shape of the Philippine Sea plate, leading an updated fault plane model along the Sagami trough.

Slow slip events have been occurred east off Boso Peninsula. The latest event occurred in 2007. It is different from the situation in Nankai that the slow slip events occurred at the same depths as the asperities of the great earthquakes. Some stations of the KAP network close to the region of slow slip events can determine the extent of the region. The relation between the slow slip region and reflection strength or between the region and Poisson ratio may be presented.

Seismicity in the southern Kanto region has been investigated by many researchers (e.g., Hori 2006, Kimura et al. 2006). Plate boundaries and small repeating earthquakes have been estimated from the seismicity. However, hypocenters and focal mechanisms have not well determined in coastal region and oceanic region because of few seismic stations in oceanic region. KAP network can improve the determination of hypocenters and focal mechanisms significantly.

Several kinds of low-frequency seismic events have been detected along the Nankai trough or western part of Japan, but have never been detected in the southern Kanto region. We do not know whether the lack of low-frequency events is true or is due to low signal-noise (S/N) ratio in the metropolitan area. High S/N ratio at bottom of borehole in oceanic region may detect such events.