

Improvement of the tomographic resolutions by Kanto Asperity Project

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Proposals for drilling and geophysical monitoring along the Sagami trough, the Kanto Asperity Project (KAP), have been submitted to the IODP, which aim to reveal properties and mechanics of asperities and slow slip regions. We discuss how improve the resolutions of the tomographic image by additionally using of arrival time data recorded by the borehole seismometers proposed by the Kanto Asperity Project (KAP).

We adopt the method of Checkerboard Resolution Test [Inoue et al., 1990] and compare the reconstructed images in the cases that the KAP borehole stations are additionally used or not. We set the modeling space for the resolution tests in the latitude range of 34-36N and the longitude range of 138.5-141.5E. We selected 7224 hypocenters occurred within the modeling space from the JMA catalogs during the period of 2001 and 2006 which satisfy the following criterion: the estimation errors of the hypocenters are less than 1.5' in latitude and longitude, 2.5km in depth and 0.25sec in origin time. We adopt hypocenter-station pairs for the JMA stations inside of the modeling space whose P wave arrivals are actually reported in the catalogs as 'IP' or 'P'. We assume that all KAP borehole stations can pick the P wave arrivals of all selected events. We adopt neither hypocenters nor stations outside of the modeling space. The numbers of data are about 98,000 and 162,000 in the cases using only JMA stations and using KAP borehole stations in addition to the JMA stations, respectively.

The results of the tests show that the reconstructed checkerboard image is well improved along the Sagami trough and the southeast side of the Boso peninsular in the depth range of 16-60km. We hope that we obtain clearer images of the asperity regions of the large earthquakes occurring along the Sagami trough and the slow slip events, with tomographic study by using of the KAP borehole stations.