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# 紀伊半島南部下の遷移領域におけるプレート構造
# Seismic structure of the locked-sliding transition on the plate boundary beneath the southern part of Kii Peninsula

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The Nankai trough region, where the Philippine Sea Plate (PHS) subducts beneath the SW Japan arc, is a well-known seismogenic zone of interplate earthquakes. The most recent great earthquakes occurred in 1944 (Tonankai Earthquake, M=7.9) and 1946 (Nankai Earthquake, M=8.0). Detailed crustal and upper mantle structure of the subducting Philippine Sea Plate and the overlying SW Japan arc are important to constrain the process of earthquake occurrence. Active and passive seismic experiments were conducted to obtain a structural image beneath the southern part of Kii Peninsula, southwestern Japan (e.g., Kurashimo et al., 2011). Sixty 3-component portable seismographs, approximately 1 km apart, were installed on a survey line between Shimokitayama and Minabe in the east-west direction. To improve accuracy of hypocenter locations, we additionally deployed six 3-component seismic stations around the survey line. Waveforms were continuously recorded during a five-month period from December, 2009. The continuously recorded data were divided into event files, starting from an origin time determined by the Japan Meteorological Agency. In October of 2010, a deep seismic profiling was conducted in the southern part of Kii Peninsula. In this experiment, 290 seismometers were deployed on a 60-km-long line between Shimokitayama and Minabe in the east-west direction with about 200 m spacing, on which five explosives shots were fired as controlled seismic sources. In order to obtain a high-resolution velocity model, a well-controlled hypocenter is essential. Due to this, we combined the seismic array data with permanent seismic station data. We used 41 permanent seismic stations in the present study. Permanent seismic stations observed the controlled seismic signals as well as natural earthquakes. We picked P- and S-wave arrivals of 677 events, including 671 local earthquakes and 6 explosive shots. The arrival times for the first P- and S- waves obtained from local earthquakes and explosive shots were used in a joint inversion for earthquake locations and three-dimensional Vp and Vp/Vs structures, using the iterative damped least-squares algorithm, simul2000 (Thurber and Eberhart-Phillips, 1999). The depth section of Vp/Vs structure shows the lateral variation of the Vp/Vs values along the top of the PHS. Clustered low-frequency earthquakes are located in and around the high Vp/Vs zone.

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