

2006 Seismic Experiment in the Eastern Part of Kii Peninsula, SW Japan, III

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In 2006, seismic refraction/wide-angle reflection survey was conducted in the eastern part of the Kii Peninsula. This experiment was one of the important branches of National research project of interplate earthquakes in SW Japan, and aimed to elucidate the geometry of the Philippine Sea (PHS) plate and inhomogeneous structure of in and around the seismogenic zone of the 1944 Tonankai earthquake. The seismic line, 87.8 km in length, is a northwest extension of offshore profile lines by JAMSTEC.

On this onshore line, 5 shot points (SP1-5) were set with a charge size of 400, 100, 200, 100 and 400kg, respectively, and 519 offline digital recording systems were deployed with a spacing of about 170m.

The obtained records were of good quality, and clear first arrivals are recognized in almost the entire part of the profile. A number of later phases are also observed, which are probably wide-angle reflections within the crust and the subducted PHS plate.

The crustal model was obtained by an integrated refraction/wide-angle reflection analysis including extended time-term method, refraction tomography and ray-tracing methods.

The uppermost crust is characterized by surface layer with $V_p=5.0-5.4$ km/s overlying a crystalline basement with a velocity of 5.6-5.8 km/s. This surface layer is 1.5 km thick in the northern edge of the profile, but becomes shallower to the south. In the central part north of the Median Tectonic Line (MTL), the crystalline basement is almost outcropped. South of the MTL, the uppermost crustal velocity is 5.2 km/s. The MTL is recognized as a steeply northward dipping reflector. The midcrustal reflectors are identified at depths of 12 and 18km north of the MTL, while at depths of 12-20 km south of the MTL. The Philippine Sea plate is traced as a northward dipping strong reflector, whose depth is 22 km at the southern edge of the profile.