

Seismic reflection profiling across the Median Tectonic Line (MTL) in the Kii Peninsula, Japan

Naoko Kato[1]; Hiroshi Sato[2]; Kiyoshi Ito[3]; Susumu Abe[4]; Naoshi Hirata[2]; Takaya Iwasaki[5]; Ryuta Arai[2]; Katsuya Noda[6]; Hideo Saito[7]; Taku Kawanaka[7]

[1] ERI; [2] ERI, Univ. Tokyo; [3] DPRI, Kyoto Univ.; [4] JGI, Inc.; [5] ERI, Tokyo Univ.; [6] GEOSYS, Inc.; [7] JGI

The Median Tectonic Line (MTL) extends more than 1000 km in SW Japan and divides SW Japan into the inner and outer zones. The western part of the MTL shows late Quaternary right-lateral strike-slip movements at several mm/y. The deep geometry of MTL active fault system is crucial for the estimation of strong ground motion in the southern part of the Osaka plain. To reveal deeper geometry of fault surface, seismic reflection profiling was performed. Along the 20-km-long seismic line 10-Hz vertical geophones, connected by a digital telemetry cables, were deployed at a 40 m spacing. To obtain a high-resolution seismic image of the shallow part of MTL, a 10-m spacing receiver array was formed using off-line recorders. The seismic source was vibroseis trucks.

Seismic section portrays the geometry of the MTL down to 6 km. The fault surface dips northward by 20 degrees (shallower than 1 km in depth), 30 degrees (1-2 km in depth) and 40 degrees (2-6 km). Deeper extension of the MTL can be traced as the top of the north-dipping reflections in the Sambagawa metamorphic rocks. It continues down to 3 km and probably trace down to 7 km on low-fold stacked section.

The bottom of the seismogenic zone beneath the Osaka plain is about 15 km. Thus, the seismogenic source fault extends to the southern part of the Osaka plain.