

Crustal structure inferred from receiver function analysis using the data of the Joint Seismic Observations at NKTZ

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The Niigata-Kobe Tectonic Zone (NKTZ) is the high strain rate zone from Niigata to Kobe estimated from analysis with spatially dense GPS array. Many models have been proposed to explain the causes of the high strain rate at the NKTZ. They interpreted the causes to be located in the upper crust, lower crust and/or upper mantle. To obtain the structure of this zone is important to know the accumulation mechanism of the stress and strain in Japanese inland area and the mechanism of the inland earthquakes.

We applied receiver function method using teleseismic waveform data to estimate the structure of the crust and the uppermost mantle at the NKTZ. We used earthquakes determined the source parameters by USGS with magnitudes larger than 5.5. The seismic stations operated by the Japanese university joint seismic observations from January 2005, Hi-net and Japan Meteorological Agency from August 2002 are used.

We analyzed the seismic structure along the profile line from Shizuoka prefecture to Ishikawa prefecture. The profile line is extended in the north-south direction to traverse the island arc of Japan from the south coast to the north coast and also traverses NKTZ. We detected distinct structure of the subducting Philippine Sea plate, Moho discontinuity and some converted planes in the crust and the uppermost mantle. The Moho was located the depth of about 40 km in the south part and 30 km in the north part with gradually dipping. In the crust, a boundary with depth from 13 km to 20 km was detected. The boundary seems to be complicated at the area of NKTZ. In Tonami plane, the discontinuity was distorted for thick sediment layer. In this line, Iidaka et al. (2003; 2004) had been already surveyed the crustal structure by controlled source. The results in this time are substantially consisted with them of Iidaka et al., although the Moho is deeper than that. We will reveal fine structure from their comparison in further analysis.