

Crustal Structure in the Kinki District from Seismic Explosion Experiments (3)

Issei Hirose[1]; Kiyoshi Ito[1]

[1] DPRI, Kyoto Univ.

In order to elucidate the relationship among crustal velocity structures, seismic activities, active faults, geologic structures, and so on, we analyzed three seismic explosion survey records conducted in the Kinki district, considering compatibility of each profile. The survey lines are (1) the Fujihashi-Kamigori profile line in 1989, (2) the Keihoku-Seidan profile line in 1995 passing through the epicenter of the 1995 Kobe Earthquake (Mw6.8) and (3) the Shingu-Maizuru profile line in 2004. As these survey lines cross at almost same area in the northern Kinki district, we can obtain the three dimensional crustal structure of the wide area. We used the time-term method and the ray tracing method (Zelt and Smith, 1992) for the seismic refraction analyses. Comparison of the seismic velocity structures with other data, we can find the followings: (i) Hypocenters concentrate on a layer in which P-wave velocity is 6.0~6.4 km/s in the northern Kinki district. It seems to indicate the physical properties of the seismogenic layer. (ii) Depth of the Moho under the Kinki district is 30~32km and the oceanic Moho of the subducting Philippine Sea Plate is determined to be 7~8km under the surface of the plate. (iii) The low frequency earthquakes related with the Philippine Sea Plate occur near the intersection of the Moho and the top of the Philippine Sea Plate. (iv) Velocity variations in the surface layer seems to be well coincident with geological structures, such as velocity is very low as 3.0 km/s in the sedimentary layers area in the central Kinki district, while velocity is 4.7 km/s in the clastic matrix area in the northern and southern Kinki districts.