Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

SCG059-10 Room:105 Time:May 26 14:30-14:45

Crust and uppermost mantle structure of transition between the Oki-Daito Rise and West Philippine Basin

Azusa Nishizawa[1*], Kentaro Kaneda[1], Mitsuhiro Oikawa[1], Yasuhiko Ohara[1], Taisei Morishita[1]

[1]Japan Coast Guard

The broadly-defined Oki-Daito Ridge, one of the bathymetric highs at the northwestern Philippine Sea plate, is divided into three parts, the narrowly-defined Oki-Daito Ridge in the southeast, Oki-Daito Plateau in the northwest and Oki-Daito Rise in the southwest. We conducted seismic exploration to elucidate transitional structure between the Oki-Daito Rise and West Philippine Basin.

The P-wave velocity structure shows that the crustal thickness decreases from 14 km beneath the rise to 6 km at the northwestern end of the West Philippine Basin. The thinning is mainly due to the lower crust. The velocity of the lower crust is reliably deduced from clear later phases propagating in the entire crust and estimated to be 7.2-7.3 km/s at the bottom of the crust, which is rather higher than a typical oceanic crust produced at a mid ocean ridge. Pn velocity is 7.9 km/s beneath the Oki-Daito Rise and increases to over 8.4 km/s below the West Philippine Basin. Such abnormally high Pn velocities of 8.4-8.6 km/s were widely found beneath the West Philippine Basin to the north of the Oki-Daito Escarpment.

A difference in the basin structure from a typical oceanic crust is existence of a constant velocity of about 5 km/s layer with a thickness of 1-2 km in the upper crust. Large reflection signals from 5-10 km below the Moho were identified in many records obtained by ocean bottom seismographs. Similar large reflection signals from about 30 km under the Moho were also detected in the region between the Oki-Daito Rise and Oki-Daito Plateau. Such deep reflection signals may characterize the upper mantle structure in this region.

Keywords: Oki-Daito Ridge, Oki-Daito Rise, West Philippine Basin