

Seismic activity in the southern part of Hyuga-nada region, southwest Japan, revealed by ocean bottom observation (2)

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In Hyuga-nada region, big earthquakes (M7 class) have occurred at intervals of about dozens of years, and so plate coupling varies dozens of kilometers specially. Big earthquakes (M7 class) have occurred in the north region from latitude 31.6 degrees north, but it has not occurred in the south region from latitude 31.6 degrees north. And microseismicity varies spatially. It is important to understand seismic activity, stress field, and structure in such region in order to understand seismic cycle.

We performed extraordinary seismic observation for 75 days from April to July 2006, and for 73 days from April to July 2008. 23 and 26 pop-up type OBSs were deployed above hypocentral region in Hyuga-nada using Nagasaki-maru in 2006 and 2008, respectively. And three data loggers were deployed on land in order to compensate a regular seismic network.

We detected earthquakes more than 2 times of JMA. Seismic activity in source region of the 1961 Hyuga-nada Earthquake (M7.0) is low, but around its source region, seismic activity is very high. We obtained that earthquakes of various focal mechanisms, such as a normal fault type, a reverse (thrust) fault type, occurred. Many thrust fault type earthquakes relatively occurred shallow place in comparison with normal fault type earthquakes. This fact indicates that the stress field in the slab is down-dip tension. In order to obtain a 3D seismic velocity structure and precise hypocenter distribution around the Hyuga-nada region, we used Double-Difference (DD) Tomography method developed by Zhang and Thurber (2003). We could detect the structure of subduction of Kyushu-Palau Ridge at low seismicity area. So, the subducted Kyushu-Palau Ridge may cause the strong interplate coupling.