

Seismic activity in the southern part of Hyuga-nada region, southwest Japan, revealed by ocean bottom observations

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The Philippine Sea (PHS) plate is subducting beneath the southwest Japan arc along the Nankai trough at a rate of about 5 cm per year. The seismic activity in the boundary between the PHS and the Eurasian (EU) plates varies spatially along the Nankai trough. Especially the region from off coast of Shikoku to the Bungo channel and Hyuga-nada has large variation of seismicity. In addition, recent studies reveal that a coupling rate between two plates has variety. 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. Uehira (2007) deduced that shear stress at near plate boundary is related to historical big earthquakes, i.e. shear stress is large in the region where big earthquakes have occurred, and shear stress is small in the region where big earthquakes have not occurred. 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. It is important to understand seismic activity and stress field in such region in order to understand seismic cycle. So, we obtained seismic data in and around epicenter region using ocean bottom seismometers (OBSs).

We performed OBS observations in cooperation with T/V Nagasaki-Maru, Faculty of Fisheries, Nagasaki University. Observation period was 75 days from 26 April to 10 July 2006. We deployed 23 OBSs in the range from latitude 30.8 degrees north to 32.0 degrees north. And also, we installed 3 temporary onshore seismic stations for the same period. Although JMA determined about 270 earthquakes in the southern part of Hyuga-nada, we could recognize over two times the number. We obtained that earthquakes of various focal mechanisms, such as a normal fault type, a reverse (thrust) fault type, occurred.