Seismic activity around the Nankai Trough axis south off the Kii Peninsula

Akira Yamazaki[1]; Kazuhiro Iwakiri[1]; Fuyuki Hirose[1]; Yasuhiro Yoshida[1]; Shigeki Aoki[2]; Masayuki Tanaka[3]; Isao Kubota[2]; Ken Moriwaki[2]; Hidetoshi Matsuoka[2]; Nariaki Okawara[2]; Reiko Kai[4]; Masao Abe[2]; Sinsaburou Nishi[2]; Hiroshi Sekitani[5]

[1] MRI; [2] JMA; [3] Earthquake and Tsunami Div.,JMA; [4] Japan Meteorological Agency; [5] Osaka District Meteorological Observatory
Seis. and Vol. Division

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A boundary line between estimated source region of the next Tonankai earthquake and the Nankai earthquake is drawn around a sea area from south off the Shionomisaki to the Nankai trough. A beginning point of a rupture of the 1946 Nankai earthquake has been determined in this sea area, and that of 1944 Tonankai earthquake is at 40km east off the Shionomisaki. On the next Tonankai or the Nankai earthquake, the beginning of the rupture is supposed to occur in the area. Due to a crustal stress change will cause somewhat of seismic activities, an investigation of the seismicity of the area is important for considering the next Tonankai or the Nankai earthquake.

We have conducted pop-up type ocean bottom seismographs(OBSs) observations around the Nankai Trough axis south off the Kii Peninsula two times. The first observation was made during the period from Oct. 18, 2005 to Nov. 25, 2005 by installing nine OBSs around the north region of the trough axis. After about half a year, we made the second observation from May. 21, 2006 to Jul. 24, 2006 by twelve OBSs with extended observation area to southwest from the first.

We picked up arrival times of seismic events which could read P or S phase more than three stations. An one dimensional velocity structure used for hypocenter determination is made from a survey result by JAMSTEC(Kodaira et al.,2006). To improve accuracy of the hypocenter locations, a station correction method has been applied to reduce a sediment layer effect using Ps converted waves. Finally, we could determine 87 hypocenters on the first and 167 on the second observation. Since the number of the hypocenters by JMA catalogue at the same region and same period is only 2 on the first and 12 on the second observation, we think we could detect not known seismic activities around the trough axis.

It is found that a seismic activity exists around the Nankai trough axis. Especially, the activity is high at area from the trough axis to 30km southward. Most of the earthquakes occur at the depth of 10km to 20km inside the Philippine Sea plate. As the seismic active region coincide to the bending zone of the subducting Philippine Sea plate, we infer the activity is caused by stress field which bending the Philippine Sea plate.

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