

Seismic structure of the rupture areas of the Tonankai,Nankai earthquakes derived from long-term sea floor earthquake observation

Kazuo Nakahigashi[1]; Tomoaki Yamada[2]; Kimihiro Mochizuki[3]; Shin'ichi Sakai[4]; Masanao Shinohara[5]; Toshihiko Kanazawa[6]; Kenji Uehira[7]; Hiroshi Shimizu[7]

[1] ERI; [2] ERI, Univ. of Tokyo; [3] EOC, ERI, Univ. of Tokyo; [4] Earthquake Research Institute, Univ. of Tokyo; [5] ERI, Univ. Tokyo; [6] ERI, Tokyo Univ; [7] SEVO, Kyushu Univ.

<http://www.eri.u-tokyo.ac.jp/nankai/index.html>

The large earthquakes with estimated magnitudes around 8 repeatedly occurred throughout history along the Nankai Trough. The recurrence periods are approximately 100 years after 1361, and the latest events are the 1944 Tonankai and the 1946 Nankai earthquakes. The Nankai Trough seismogenic zone is one of the most well-studied subduction seismogenic zone in the world. However, hypocenters were not able to determined accurately by the land seismic network. Therefore, we began earthquake observations on the estimated rupture areas of the Tonankai and the Nankai earthquakes, to understand the seismic activities around the rupture area, using long-term type ocean bottom seismographs (LTOBSs). In this study, we present the seismic structure obtained by seismic tomography method using LTOBSs and land station data.

We started the observation in 2003, using 9 LTOBSs. We retrieved them and deployed 23 LTOBSs in 2004. In 2005, 23 LTOBSs were retrieved and redeployed. The spatial intervals among LTOBSs were about 20km. This seismic network covered the Tonankai and the Nankai rupture area. In addition, the seismic surveys with controlled sources were conducted to obtain a shallow part structure beneath LTOBSs in 2003, 2004.

To determine a seismic structure, we used the tomographic method developed by Zhao et al. (1992,1994). We used P and S wave arrival times picked from digital data recorded by LTOBSs and land stations. The high P-wave velocity region, which continues down to a depth of 20km, was found off the Kii Peninsula. This high P-wave velocity region was also estimated by the previous seismic survey.

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