

## Structural variation and geometry of the Philippine Sea plate of the southwestern Nankai seismogenic zone

NAKANISHI, Ayako<sup>1\*</sup>, SHIMOMURA, Norio<sup>1</sup>, KODAIRA, Shuichi<sup>1</sup>, OBANA, Koichiro<sup>1</sup>, TAKAHASHI, Tsutomu<sup>1</sup>, YAMAMOTO, Yojiro<sup>1</sup>, SATO, Takeshi<sup>1</sup>, KANEDA, Yoshiyuki<sup>1</sup>, MOCHIZUKI, Kimihiro<sup>2</sup>, KATO, Aitaro<sup>2</sup>, IIDAKA, Takashi<sup>2</sup>, KURASHIMO, Eiji<sup>2</sup>, SHINOHARA, Masanao<sup>2</sup>, TAKEDA, Tetsuya<sup>3</sup>, SHIOMI, Katsuhiko<sup>3</sup>

<sup>1</sup>JAMSTEC, <sup>2</sup>ERI, Univ. Tokyo, <sup>3</sup>NIED

In the Nankai Trough subduction seismogenic zone, the Nankai and Tonankai earthquakes had often occurred simultaneously, and caused a great event. It is necessary to understand rupture synchronization and segmentation of the Nankai megathrust earthquake. For a precise estimate of the rupture area of the Nankai megathrust event, it is important to know the geometry of the subducting Philippine Sea plate and deep subduction structure along the Nankai Trough.

Based on our latest structural study of Hyuga-nada region, structural boundary between the oceanic crust of the Shikoku Basin and the crust of the Kyushu Palau Ridge is identified as the western margin of the type of Nankai megathrust event such as the Hoei earthquake occurred in 1707. To understand structural factors controlling coseismic rupture of the Nankai earthquake in 1946, the large-scale high-resolution wide-angle seismic study was conducted in 2009 and 2010. It is also important to obtain structural image and its variation around the deep low frequency earthquakes and tremors area.

In this study, approximately 200 ocean bottom seismographs were deployed for each experiment off the Shikoku Island and the Kii channel respectively. A tuned airgun system (7800 cu. in.) shot every 200m along 13 profiles. Airgun shots were also recorded along an onshore seismic profile (prepared by ERI, univ. of Tokyo and NIED) prolonged from the offshore profile off the Kii Peninsula. Long-term observation was conducted for ~9 months by 21 OBSs off the Shikoku area and 20 OBSs off the Kii channel.

Geometry of the subducting Philippine Sea plate from the Hyuga-nada region to off the Shikoku area, there is no notable variation in the subducting angle or structure around the western margin of the 1946 Nankai earthquake area. However, different structural image around the source area of the deep low frequency earthquakes and tremors is obtained by using the airgun shots recorded at onshore Hi-net (NIED, Japan) data located along prolongation of the offshore seismic profiles. At the western margin of the Shikoku Island, the deep low-frequency earthquakes and tremors are estimated to occur at the subducting plate boundary shallower than the forearc mantle, considering the normal velocity of the forearc mantle.

This research is part of 'Research concerning Interaction Between the Tokai, Tonankai and Nankai Earthquakes' funded by Ministry of Education, Culture, Sports, Science and Technology, Japan.