

Seismic imaging in the central Nankai trough, off Shionomisaki to Kii channel

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Shallow very low frequency events (sVLFE) have been reported in the Nankai Trough subduction zone recently. In the central part of the Nankai trough, sVLFE were observed off Kii channel and Shinomisaki, but not reported in the area between them, off western Kii peninsula. We conducted a seismic survey with R/V *Kaimei* in November and December 2018 in Nankai subduction zone off Kii channel to Shonomisaki to investigate the structural features and its possible relationship to the sVLFE. R/V *Kaimei* fired 10600 inch³ air gun array at every 50 m and a streamer cable (4.3 km at shortest, 5.7 km at longest) recorded the seismic signals. We acquired 23 seismic profiles with the length of ~ 75 km in dip direction at 4 km line separation and four profiles of ~ 90 km in strike direction at the shallowest part of the subduction zone. In addition, seven dip profiles with the length of 35 km were acquired off Kii channel to cover the lowermost part of the landward slope densely. The streamer cable was towed at a depth of 25 m to relatively enhance the lower frequency signals for better imaging of the deeper structure. Preliminary processed seismic profiles exhibited the structural variation in the survey area. Deformation of the hanging wall sediments and decollement were well imaged especially ~ 20 –30 km from the trough axis. Top of subducting Philippine Sea plate can be observed through ~ 40 –50 km from the trough axis in some of the obtained profiles. A pair of apparently low angle deep strong reflections were imaged at ~ 7 –8 s two-way time around 40 - 50 km from the trough axis off the western Kii peninsula, which was located slightly east and landward of the area with sVLFE. The shallowest part of the subduction zone in the area where the recent sVLFE activity was not reported, a slope basin with younger sediments deposited over the body of the accretionary prism is imaged, and the deformation was not observed in the slope basin. This suggests the thrust faults within the accretionary prism have not been active recently in this area. We will further process acquired data to obtain clearer seismic images and discuss the structural features and its connection to the observed seismological events in the Nankai Trough.

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