Multi-channel seismic reflection study in the Nankai Trough off Cape Ashizuri of Shikoku

Jin-Oh Park [1], Tetsuro Tsuru [2], Shuichi Kodaira [3], Ayako Nakanishi [3], Narumi Takahashi [4], Toshihiko Higashikata [5], Seiichi Miura [3], Yukari Kido [6], Yoshiyuki Kaneda [7], Hajimu Kinoshita [8], Yoshiteru Kono [9]

[1] JAMSTEC, FRPSD, [2] Frontier, Jamstec, [3] FRPSD, JAMSTEC, [4] DSR, JAMSTEC, [5] JAMSTEC Frontier, [6] Frontier Res. Prog. Subduction Dynamics, JAMSTEC, [7] JAMSTEC,Frontier, [8] JAMSTEC, DSR, [9] Earth Science, Graduate Schl.Nat.Sci.Tech., Kanazawa Univ.

The Nankai Trough margin is a very important field to evaluate earthquake potentiality of convergent plate margin in that great earthquakes have periodically occurred. We have carried out KR98-10 cruise using R/V "KAIREI", to obtain a high-resolution seismic crustal structure of the Nankai Trough margin off Cape Ashizuri of Shikoku, SW Japan in October, 1998. During the cruise, we conducted multi-channel (120-ch.) seismic (MCS) reflection and ocean bottom seismographs refraction experiments. The MCS profiling was done on the two survey lines which are perpendicular each other. In this paper, we would like to present the MCS data and discuss its geologic and tectonic implications.

The Nankai Trough margin is a very important field to evaluate earthquake potentiality of convergent plate margin in that great earthquakes have periodically occurred. We have carried out KR98-10 cruise using R/V "KAIREI", to obtain a high-resolution seismic crustal structure of the Nankai Trough margin off Cape Ashizuri of Shikoku, SW Japan in October, 1998. During the cruise, we conducted multi-channel (120-ch.) seismic (MCS) reflection and ocean bottom seismographs refraction experiments. The MCS profiling was done on the two survey lines which are perpendicular each other. One is crossing the Nankai Trough and about 165 km long. The other is parallel to the Trough and about 255 km long.

In this paper, we would like to present the MCS data and discuss its geologic and tectonic implications. We could identify a clear seismic reflector of the Philippine Sea Plate (PSP) subduction to more than 70 km long landward from trench axis. Also, a reflector from Moho discontinuity could be identified to more than 60 km long landward from trench axis and about 16 km deep. There are many thrust faults and Bottom Simulating Reflector (BSR) in the accretionary prism. Based on reflection characteristics, we identify three major seismic reflection units; denoted "A", "B", and "C". Unit A, consisting of Miocene to recent accretionary deposits, shows a hummocky internal reflection pattern and many northward dipping reflectors which are interpreted as thrust faults and have been observed throughout the Nankai accretionary prism. Unit B, consisting of Miocene to Pliocene Shikoku Basin sediments, shows discontinuous internal reflections and seems to be thickening landward. Unit C consists of pre-Miocene basaltic and upper mantle rocks. It is characterized by chaotic internal reflections and corresponds to the subducting PSP.