

Configuration of the subducting PHS plate beneath off-Boso area revealed by JAMSTEC KR08-04 off-Boso survey lines

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There is an extremely complex subduction system converging the three plates, that is, the Pacific (PAC), the Philippine Sea (PHS), and the North American (NAM) plates with different directions and velocities forming a triple junction off the Boso peninsula, south Kanto, central Japan. To obtain the detailed crustal structures of this region, a high-quality multi-channel seismic reflection survey KR08-04 was conducted in April, 2008, by Japan Agency for Marine-Earth Science and Technology (JAMSTEC).

This survey was made along three NE-SW trending seismic lines; Line1 of 186 km, Line2 of 67 km, and Line3 of 85 km in length. The longest Line1 is running from 70 km south of cape Nojima to the 50 km southeast of cape Inubo across both the Sagami trough and the deformation front associated with the subducting PHS plate.

In the resultant profiles, we can find predominant northeast-dipping reflections traceable from the Sagami trough to northeastern end of the survey lines. The reflections are interpreted to be the top of the PHS plate. We can also find a deeper reflection beneath the PHS reflection at the northeastern end of the profile. The deeper reflection continues with the top of PAC plate detected by JAMSTEC KR01-10 survey of 2001.

The combination of our results with Tsumura et al.(2009), Kimura et al.(2009), and Tsuru et al.(2002) produces a first detailed contour map of the PHS upper boundary, which indicates (1) the subducting PHS plate widely spreads to 60 km east off the cape Inubo, (2) the upper surface changes its strike from NW-SE off the southwestern Boso peninsula to NE-SW off the eastern, forming a very gentle concave facing northwest ward, and (3) its dip becomes steeper from about 6 to 12 degrees about 40 km east off the Boso coastline.