Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

SCG57-04 Room:A06 Time:May 27 15:00-15:15

Crustal structure in an arc-back-arc basin of the southeastern Japan Sea off Noto Peninsula deduced from seismic survey

SATO, Takeshi[1*] ; NO, Tetsuo[1] ; MIURA, Seiichi[1] ; KODAIRA, Shuichi[1] ; ISHIYAMA, Tatsuya[2] ; SATO, Hiroshi[2]

[1]JAMSTEC, [2]ERI, Univ. of Tokyo

The Japan Sea is one of very well studied back-arc basins in the northwestern Pacific. Based on geophysical, geological, and petrological results, in the margin of the Japan Sea including the coastal area, the deformation, which includes the extension by the back-arc opening during the late Oligocene and the shortening since the late Pliocene, has developed (e.g., Tamaki, 1988; Sato, 1994). Little is known about the understanding of this deformation processes in this margin. Recently, in the eastern margin of the Japan Sea, it was found from the result that the deformation zone affected by the shortening and back-arc opening is distributed on the rifted island arc crust in the northern and southern parts, and on a structural boundary between the rifted island arc crust and the thicker oceanic crust in the northern part only by the seismic survey (No et al., 2014, Sato et al., 2014). However, in the other margin of the Japan Sea, we have little information about the relationship between a crustal structure and the deformation. To understand the deformation process in the margin of the Japan Sea, it is necessary to clarify the crustal structure, not only the transition area between the island arc and the back-arc basin, but also the back-arc basin area. In 2014, the seismic survey using ocean bottom seismographs (OBSs), an air-gun array, and a multi-channel hydrophone streamer was undertaken from the arc to the back-arc basin of the southeastern Japan Sea off western Noto Peninsula. For this study, we will present the crustal structure model.

The offshore seismic refraction/wide-angle reflection survey using 60 OBSs and a tuned air-gun array (7,800 cu. inch) was conducted the continental shelf off the western Noto Peninsula suffered from the crustal shortening, the southern Yamato Basin, to the Yamato Bank in the southeastern Japan Sea. This survey line has about 350 km length. In record sections of several OBSs and land stations, not only the first arrived phases but also later phases reflected from interfaces in the crust and uppermost mantle are visible.

The crust in the continental shelf area off western Noto peninsula is estimated as having about 24 km. The upper part of the crust has a lateral variation until depth of about 10 km. This variation may correspond to the characters of the deformation. On the other hand, the crustal thickness of the southern Yamato Basin off western Noto peninsula is about 13 km. This crust is thinner than that of the northern Yamato Basin off the northwest Sado-ga-shima island and Awa-shima island (e.g., Sato et al., 2014). In the Yamato Bank, the crust is estimated as having about 21 km and may have the character of the continental crust.