# Seismic experiment using OBSs and airguns in the rupture zone of Miyagiken-oki earthquake.

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Magnitude 7.5 class interplate earthquakes have recurred in the region off Miyagi due to the subduction of the Pacific plate beneath the northeastern Japan island arc. It is inferred the possibility that a large earthquake occurs in the near future is high. The crustal structure around the rupture zone of Miyagiken-oki earthquake have been estimated by several refraction/reflection experiments and seismic observations, but the detail structure have not been revealed yet.

To reveal the detailed crustal structure around the rupture zone of the Miyagiken-oki earthquakes and understand the relationships between the crustal structure and the mechanism of the large earthquakes in this region, we conducted a seismic refraction/reflection experiment in the region off Miyagi using Ocean Bottom Seismometers (OBSs) and artificial seismic sources (airguns and explosives), in summer 2004. We deployed 72 OBSs along three seismic experimental lines.

The line-A is perpendicular to the trench axis and an east-west line across the rupture zone of Miyagiken-oki earthquakes. This line is coincident with the previous seismic refraction/reflection experimental line conducted in 1999 by JAMSTEC, but we deployed OBSs just above the rupture area where no OBSs had been deployed in 1999. Integrating both airgun data set, we could determine the geometries of island arc Moho and the Conrad discontinuities just above the rupture zone. Line-B and Line-C are 300km long, and perpendicular to the Line-A. We have determined the shallow crustal structure by the first arrival tomography using airgun-OBSs data so far. The obtained velocity structures are consistent with the velocity structure of Line-A, and it is inferred the thickness of upper island crust is thinner in the margin of the rupture zone than the rupture zone.

Many later phases, which are interpreted as reflected waves, are observed in the record sections. We are going to use these later phases in the structure analysis and reveal the deeper crustal structure such as the island arc Moho and the plate boundary interface.