Characteristics of reflected phases at the Japan Trench obtained by OBS-airgun study in 2001 (Preliminary report)

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Recent GPS and rapture process studies for large earthquakes suggest that earthquake generation is controlled by distribution of asperities. Among subduction zones around the Japanese islands, the subduction zone in the Japan Trench is one of the well studied areas in viewpoint of asperity distribution. The seismic experiment using controlled source-OBS study in 1996 showed strong correlation between seismic reflection intensity and the seismic activity in 38deg-40min N and 39deg -00 min N on the forearec slope of the Japan Trench(Fujie et al., 2000). One of interpretations is presence of fluid or weak material at the plate boundary behaving as a lubricant to reduce strength of plate coupling.

In order to study a 3-D distribution of seismic reflection intensity for this region, we carried out a seismic experiment in 2001 off the Kamaishi in the forearc slope of the Japan Trench using R/V Hakuho-maru and a chartered ship. Forty OBSs were placed on 30 km x 50 km on seven seismic lines. Aiguns with 57 litter chamber capacities were used as seismic source. The present report describes the outline of experiment and preliminary results obtained by this experiment. Fan-shape shooting records were obtained by an OBS on a particular N-S line and the seismic shootings on other six N-S lines. Preliminary results support the observations in 1996.