

Wide angle seismic experiments in the Western Pacific in 2005 (1)

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We report preliminary results of 2005 seismic refraction experiments for the determination of the Japanese legal continental shelf limit. The investigation is divided into two according to the seismic source: one is a large capacity tuned airgun array equipped in M/V Tairikudana for penetration to thicker crusts and the other is a non-tuned airgun array in S/V Shoyo for rather thin crusts. Here, we describe the former experiments. Eleven seismic lines were planned to obtain crust and upper mantle structural models of the Daito Ridges region in the northern Philippine Sea and of the Ogasawara Plateau on the Izu-Ogasawara subduction zone. The total length of the profiles was 5,870 km and the total number of ocean bottom seismographs (OBS) amounted to 1163.

We used a tuned array of 36 airguns with a total volume of 8,040 inch³ as a controlled seismic source. We shot the airgun array at an interval of 200 m (90 s) for each line. OBSs as receivers were deployed at an interval of 5 km. These data were modeled by a tomographic inversion (tomo2D, Korenaga et al., 2000) and two-dimensional ray tracing (Kubota et al., 2005).