

日本海溝北部における高分解能反射法探査 High resolution seismic profiling in the northern Japan Trench axis area

中村 恭之^{1*}; 小平 秀一¹; 三浦 誠一¹; 山下 幹也¹; 藤江 剛¹; 下村 典生¹; 井和丸 光¹
NAKAMURA, Yasuyuki^{1*}; KODAIRA, Shuichi¹; MIURA, Seiichi¹; YAMASHITA, Mikiya¹; FUJIE, Gou¹; SHIMOMURA,
Norio¹; IWAMARU, Hikaru¹

¹ 海洋研究開発機構

¹Japan Agency for Marine-Earth Science and Technology

Marine geological and geophysical surveys and analysis of their results have revealed that the ruptured area of the 2011 Tohoku earthquake extended up to the vicinity of the trench axis along the plate boundary fault. To investigate the geological structure, especially the faults and the deformation of the sediments, we have conducted reflection seismic surveys in the trench axis area of the Japan Trench off Miyagi and Iwate prefectures. Three seismic cruises have been carried out in 2011 and 2013 along 81 E-W (dip) lines and 17 N-S (strike) lines. We have used 320 or 380 inch³ cluster air guns and a 1200 m long streamer cable to obtain high resolution seismic data. Surveyed area covers the trench axis area along the trench strike from seaward of the hypocenter of the Tohoku earthquake around 38 N at south, to ~40 N at north. Seismic profiles around 38 N show that the trench axis is located on a graben with sediments which have been deformed by reverse faulting. Similar deformation structure is observed around 40 N, but the trench axis is located on a horst not a graben there. The thickness of the incoming sediments on the Pacific plate typically ranges ~0.3 ? 0.5 s in two way time, however it is reduced down to <0.2 s around 39.5 N where the basement of the oceanic crust shows higher relief and trench inner wall is significantly steep. The thickness variation of the incoming sediments can be traced seaward and corresponded with along strike variation of the structure in the outer rise. These high resolutions seismic data served for the site selection of the JFAST drilling project by IODP and also contributes to the JTRACK proposal for future drilling in the Japan Trench following success of the JFAST.