

Preliminary report on a seismic reflection survey off the northern coast of Sanriku-Oki, Japan Trench

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The Japan Agency for Marine-Earth Science and Technology (JAMSTEC) conducted deep seismic surveys using the research vessels “*KAIKEI*” and “*KAIYO*” in the late 1990s, but both vessels have been retired; since the late 2010s, surveys have mainly been conducted using the new research vessel “*KAIKEI*.” Moreover, excluding the area around the source region of the 2011 Tohoku-Oki Earthquake, there are many areas from off the southeast coast of Hokkaido to off the coast of Ibaraki Prefecture, where old data were acquired by “*KAIKEI*” and “*KAIYO*” more than 20 years ago, and there are regional differences in the density of survey lines. Therefore, a new deep seismic data acquisition by “*KAIKEI*” is being conducted since 2017. Compared with the data acquisition systems of 20 years ago of the JAMSTEC vessels, the streamer cable length for the seismic reflection survey was 1.5 times longer, the channel interval is less than half, and the source waveform is improved and more stable. As a result, higher-quality deep seismic data acquisition and analyses are possible. In 2022, we planned a seismic reflection survey line from off the southeast coast of Hokkaido to off the coast of Iwate Prefecture using *KAIKEI* and performed a cruise (Cruise ID: KM22-07) in May and June, but the weather was not conducive and only one survey line (Line ID: KJ2204) was acquired. This line crossed the Japan Trench at 40°N in the east–northeast to the west–southwest direction with a line length of 176 km. Several large M7-class plate boundary earthquakes, such as the 1994 Sanriku-Oki Earthquake (M_j7.6), have occurred in the vicinity of this line. Additionally, the Seafloor Observation Network for Earthquakes and Tsunamis along the Japan Trench (S-net) has been deployed around Japan and the Kuril Trenches since the late 2010s (National Research Institute for Earth Science and Disaster Resilience, 2019). As a result, improved accuracy of routine seismic observations and new knowledge, such as research on low-frequency tremor activities (e.g. Nishikawa et al., 2019; Tanaka et al., 2019), have been obtained. In this presentation, we report on the data acquisition and preliminary results of data analysis in KJ2204.

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