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-phase observations in the offshore area of northeastern and southwestern Japan

Permanent seafloor seismic and tsunami observation networks were deployed near the Japan trench and the Nankai trough, Japan. We can monitor seismic waves and tsunamis at the stations in real time and also T-phase signals propagating via the SOFAR channel in the ocean. In this study, we investigated the acoustic source location of the T-phase energy with the travel-time analysis using short-period (3-8 Hz) seismic data at the stations at the depths of 1,000 to 4,500 m. The epicenter dominantly distributes around the Izu-Bonin and the Kuril subduction zones where steep seafloor slopes are developed from forearc areas and island chains to the trench axis, indicating that seismic waves at seismic activities in the subduction zones and volcanic activities in the islands are efficiently converted into acoustic waves in the slope. Our analyses using seafloor station data as a large array in the conjugate depth of the SOFAR channel may contribute to developing our understandings of the mechanism of T-phase generation and also to monitoring small seismic and volcanic events in ocean areas where the present land station network is insufficient for their detection and coverage.

Primary author: NAKAMURA, Takeshi (National Research Institute for Earth Science and Disaster Resilience)

Presenter: NAKAMURA, Takeshi (National Research Institute for Earth Science and Disaster Resilience)

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