2-D seismic reflection survey across the Izu Bonin forearc seamounts using the R/V *Kaimei*

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The research vessel *Kaimei* (R/V *Kaimei*), completed in 2016, is the newest research vessel of the Japan Agency for Marine-Earth Science and Technology (JAMSTEC). This multipurpose research vessel conducts oceanic observations and research in multiple areas, such as earthquakes, tsunamis, submarine resources, and atmospheric and marine environments. One of the remarkable features of this vessel is that the seismic survey system complies with the specifications of four types: 3-D seismic surveys, high-resolution 3-D seismic surveys, 2-D seismic surveys, and seismic survey using ocean bottom seismographs (OBS). As part of a sea trial of seismic system, JAMSTEC and Mitsubishi Heavy Industries conducted a 2-D seismic reflection survey in the Izu Bonin forearc in January 2017. A trial seismic line was set across the Torishima and Torisu seamounts, which are dotted along the landward slope of the trench westward of the Izu Bonin Trench. Furthermore, drilling research by the Ocean Drilling Program (Fryer et al., 1990), crustal structure study using OBSs (Kamimura et al., 2002), and observation by the deep submergence research vehicle *SHINKAI 6500* (Fujioka et al., 1995) were conducted near the survey line. These studies revealed that the seamounts were formed as serpentinite seamounts. Therefore, this seismic data may be important to study the internal structure of these serpentinite seamounts.
Following are the data acquisition specifications of this survey: The shot spacing was 50 m and the record length was 13 s. The tuned air gun array had a maximum capacity of 10,600 cu in (approximately 173.7 L) and comprised 44 air guns. The standard air pressure was approximately 2,000 psi (approximately 14 MPa). The air gun array was kept 10 m below the sea surface throughout the experiment. During the air gun shooting, we towed a 1920-channel hydrophone streamer cable. The receiver interval was 3.125 m, and the cable was approximately 6 km long. The towing depth of the streamer cable was maintained at 12 m below the sea surface using depth controllers. Since the receiver interval and common midpoint interval of the *Kaimei* system are 1/2 to 1/4 times as narrow as those of general multichannel seismic reflection systems, seismic data of the *Kaimei* system should operate effectively for processing waveform data of spatial direction, such as the suppression of spatial aliasing, migration, and velocity filter, if we acquire good quality data.
We introduce an outline of multimode seismic systems of the R/V *Kaimei*, and report about a seismic reflection data across the Izu Bonin forearc seamounts.
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Keywords: seismic reflection survey, spatial aliasing, Izu Bonin forearc

