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Crustal Imaging of initial structure in Izu-Ogasawara forearc region obtained by seismic reflection survey

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The Izu-Bonin (Ogasawara)-Mariana (IBM) arc is known to the typical oceanic island arc, and it is the most suitable area to understand the growth process of island arc. The existence of two paleo arc which consists of Oligocene and Eocene paleo age is known in IBM forearc region by geological and geophysical studies. The Ogasawara ridge is also known to locate the initial structure of arc evolution from geologic sampling of research submersible. In this region, IODP drilling site: IBM-2 is proposed in order to understand the temporal and spatial change in arc crust composition from 50 to 40Ma magmatism. Site IBM-2 consists of two offset drilling holes (BON-1, BON-2). BON-1 designed to first encounter forearc basalt and will reach the sheeted dykes. BON-2 will start in boninites and finish in fore arc basalts. The purpose of these drilling is sampling the full volcanic stratigraphy from gabbro to boninite. This drilling project is already scheduled in 2014. The survey lines along the proposed sites, however, there are no crossing seismic data around BON-1 and BON-2. Therefore, it is need to conduct the MCS survey until 2013 for the evaluation of proposed site.

Japan Agency for Marine-Earth Science and Technology (JAMSTEC) newly carried out multi-channel seismic reflection (MCS) survey using 7,800 cu.in. air gun, 5 km streamer with 444 ch hydrophones in April, 2013. We obtained two seismic reflection profiles of lines IBr11n and IBr11 across from Shikoku Basin and current volcanic front to the paleo arc. The preliminary results show the distribution of volcanic sediments and basement.We also identified the block type structure associated with the uplift in northern side of Kinyo seamout. We will discuss about the characteristics between backarc and forearc from north to south.

Keywords: MCS survey, IBM forearc, initial arc structure