

## Seismic velocity variation along northern Izu-Bonin arc

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The Izu-Bonin Island arc is an intra-oceanic island arc, where the Pacific plate subducts beneath the Philippine Sea plate. Recent active seismic surveys in the Izu-Bonin arc show significant variations in thickness of the middle crust along the volcanic front [Kodaira et al, 2007]. To understand the crustal evolution in the oceanic island arc, we have to clarify structures in the mantle wedge along the arc in addition to the oceanic island arc crust. We conducted seismicity observations to investigate structure variations in northern Izu-Bonin arc using natural earthquakes. A temporal ocean bottom seismograph (OBS) network consists of 40 pop-up type OBSs was deployed in April 2006 between Tori-shima and Hachijo-jima islands. These OBSs were retrieved in July after about 80-day observations. We used continuous seismic data at 36 OBSs and three F-net and Hi-net seismic stations on Hachijo-jima and Aoga-shima islands operated by National Research Institute for Earth Science and Disaster Prevention. During the OBS observations, more than 4000 earthquakes were observed by the OBSs. First, we modeled 1-D velocity structure using the VELEST [Kissling et al., 1995]. We used 325 earthquakes of which both P- and S-wave arrivals observed at 10 or more stations and occurred within the OBS network. The number of arrival data is 5382 and 5764 for P- and S-wave arrival, respectively. Then, we estimated 3-D velocity structure using the method by Kamiya and Kobayashi [2007]. The result of the 1-D velocity modeling was used for the initial model in the 3-D velocity tomography. We used about 2000 earthquakes for the 3-D tomography. The number of P- and S-wave arrivals are about 23000 and 26000, respectively. The estimated 3-D structure shows approximately 200 km scale variation of seismic velocities in the mantle wedge beneath the volcanic front. The low velocity anomalies in the mantle wedge were imaged near Hachijo-jima and Sumisu-jima. Compare to the crustal structure along the volcanic front [Kodaira et al., 2007], these low-velocity anomalies in the mantle wedge correspond to thicker part of whole island arc crust including the middle and lower crust.