

## **Seismic velocity anomaly in the mantle wedge along the Izu-Bonin intraoceanic island arc**

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The Izu-Bonin arc is an intraoceanic island arc where the Pacific plate subducts beneath the Philippine Sea plate. Along-arc variation in thickness of the arc crust has been observed by previous active seismic surveys beneath the Izu-Bonin arc. We have imaged three-dimensional (3-D) seismic velocity structures in the northern Izu-Bonin arc using arrival time data of the earthquakes during 80 days of observations by ocean bottom seismographs (OBSs) and three permanent island seismic stations. Our 3-D velocity model indicates heterogeneous structure in the mantle wedge along the arc. Low-velocity anomalies related to upwelling flow in the mantle wedge are not uniform beneath the volcanic front. Low-velocity anomalies extending down to the subducting slab beneath the volcanic front coincide with thicker parts of the arc crust north of Aoga-shima and south of Sumisu-jima. This coincidence suggests that heterogeneous mantle upwelling flow fundamentally controls the growth of the arc crust. Along topographic highs in the forearc, low-velocity anomalies in the crust and uppermost mantle coincide with positive magnetic anomalies suggesting the presence of a remnant arc, providing further evidence of this view of arc crust formation. Another study in the southern Izu-Bonin arc is in progress. We have succeeded to observe approximately 6000 earthquakes during about 80 days of OBS observations in 2009. We will discuss relationships between the mantle wedge and the island arc crust structures in Izu-Bonin arc based on these OBS data.