

## Nature and variation of the crust-mantle mixture layer along the Izu-Bonin island arc deduced from seismic survey data

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The Izu-Bonin island arc is a region of the crustal growth by subducting of the Pacific plate beneath the Philippine Sea plate. In the seismic velocity structure along the northern Izu-Bonin island arc beneath the volcanic front, the seismic velocity varies gradually from the lower crust to uppermost mantle (Kodaira et al., accepted). However, the detailed distribution of the seismic velocity contrast between interfaces of the crust-mantle transitional layer and uppermost mantle is unknown because this velocity structure is obtained by the tomography method using the travel-time data. To understand the nature of the crust-mantle transitional layer and uppermost mantle during crustal growth, it is also important to obtain the distribution of the velocity contrast value between interfaces of these layers using the comparison of the observed and synthetic waveforms wide-angle seismic data.

In 2004 and 2005, seismic refraction/reflection surveys using ocean bottom seismometers (OBSs) and airguns were conducted along the Izu-Bonin island arc from the Sagami Bay to Kaitoku Seamount beneath the volcanic front (Kodaira et al., accepted). In record sections of OBSs, not only the first arrived phases but also later phases reflected from interfaces in the crust and uppermost mantle can be observed. In this study, to obtain the velocity model with velocity contrast values of the top and bottom of the crust-mantle transitional layer, and of the interface within the uppermost mantle, we computed synthetic wave forms using a 2D/3D finite difference wave propagation program code 'e3d' (Larsen and Harris, 1993; Larsen and Grieger, 1998).

In the northern Izu-Bonin island arc, the top of the crust-mantle transitional layer has a velocity contrast value of about 0.3 km/s ranging from the Sagami Bay to Tori-shima. The bottom of the crust-mantle transitional layer having the velocity contrast exists from the Sagami Bay to Tori-shima, however this contrast value of the bottom of this layer is weaker toward the Tori-shima. From these results, the crust-mantle transitional layer interpreted by mixture of differentiated crustal materials and basaltic magma during the crustal growth in the northern Izu-Bonin island arc shows the layered structure. And, a weaker velocity contrast of the bottom of this transitional layer toward the Tori-shima may show the difference of the ratio of the mixture of differentiated crustal materials and basaltic magma to olivine cumulates in this layer by the gradual variation of crustal growth. As for the interface within the uppermost mantle, there is a small velocity contrast in some parts (around the Miyake-jima, between the Hachijyo-jima and South Hachijyo caldera, and around the Myojin-syo).