

## Three Dimensional velocity structure off the islands of Miyake-jima and Kozu-shima obtained by travel time analyses (4)

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We obtained a model of three-dimensional (3-D) P- and S-wave velocity structures off the islands of Miyake-jima and Kozu-shima, at the northern end of the volcanic front of the Izu-Ogasawara (Bonin) arc, using both of the data from ocean bottom observations and usual seismic network observations. A seismic swarms began under Miyake-jima in June 26, 2000, and was linked to the eruption of Miyake-jima. It spread toward the northwestern ocean ridge from Miyake-jima and the largest earthquake swarm ever recorded in Japan followed.

The ocean bottom observations were carried out from July 2, 2000 to May 6, 2001, in collaboration with Hydrographic Department, Japan (HDJ), the Japan Marine Science and Technology Center (JAMSTEC) and the Earthquake Research Institute (ERI). To estimate 3-D P-wave velocity ( $V_p$ )

and S-wave velocity ( $V_s$ ) structures, we used the arrival time data of earthquakes. Due to the high irregularity in the uppermost crust and the difficulties of handling both of the data of seabed and the land at once, we were required to consider the effect just beneath the stations. We regarded the travel time differences above 5km depth as the station corrections, that was obtained between refracted and reflected surveys by artificial hypocenters and this study. To examine the change by time, three data sets for July, August and September-December were given. Next, we inverted the data of arrival times: the one of 89142P- and 40334 S- wave from 3543 local earthquakes for July, the one of 52974P- and 31287S- wave from 3632 earthquakes for Aug, and the one of 16757P- and 10397S- wave from 840 earthquakes for Sep.- Dec. Then we determined  $V_p$ ,  $V_s$  and  $V_p/V_s$  models in the swarm region, applying the seismic tomography method to the arrival data.

Thus  $V_p/V_s$  anomalies in the swarm region suggest the intrusion of magma. The epicenter distribution shows NW-SE linearment, perpendicular to the tensional axis inferred from the earthquake mechanisms. The sectional view which is orthogonalized to the linearment shows the thin (2km thick) and tabular hypocenter distribution located from 3km to 15km depth. It also indicates the magma intrusion in this area.