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Inhomogeneous structure inferred from reflected S waves beneath the Bungo channel, southwest Japan.

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Analysis of reflected phases provides accurate image of structure in deeper region than use of refracted waves. The depth of upper boundary of the Philippine Sea plate subducting beneath the Bungo channel, southwestern Japan has been estimated from the travel time data of the reflected or converted phases observed in the seismic record of the intraplate earthquake (Oda et al., 1990; Miyoshi and Ishibashi 2007). In the seismograms of the crustal earthquakes observed at the stations near the Bungo channel, we found many reflected phases. In this study, we attempted to reveal the inhomogeneous structure in detail by using data of an earthquake cluster in the shallower part of the crust.

After the normal moveout correction, we found the reflected phases in most of the observed seismogram from reflectors in depth range from 15 to 20 km depths under assumption of horizontal reflectors. The waves from the reflector deeper than 30 km depth, which is close to the plate interface, were also seen in some traces.

In order to improve the estimation of the location and the shape of the reflector, we developed a method that minimizes both residuals of travel time data and amplitude ones. Applying the method to the data at SIKH where the distinct phases are observed, we determined the reflector lying not on the plate boundary but near the hypocenter of the non-volcanic tremors. The estimated reflection coefficient implies that the reflector has high impedance contrast to the crustal material. However, the coefficient does not always reliable due to the large variance of data in the estimation. In further study, we should improve the estimation by adding new data set.

Keywords: the Bungo channel, slow earthquakes, amplitude data of reflect phases