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Estimation of seismic velocity discontinuity in the crust and uppermost mantle beneath the northern Kinki region

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The northern Kinki region constitutes Niigata-Kobe Tectonic Zone, and Philippine Sea plate subducts from southeast beneath this region. In addition, micro-earthquakes occur actively. It is known that the S-wave reflector exists at the depth of 25-30 km in this region (e.g. Aoki et al., 2013). Aoki et al. (2013) found that the three dimensional distribution of the S-wave reflector. They suggested that the fluid derived from mantle might make the S-wave reflector. The dehydration from the subducting Philippine Sea plate is considered as the source of the fluid. Thus, It is important to estimate the shape and the depth of the subducting Philippine Sea plate. Because the condition of temperature and pressure is important when hydrous minerals in the oceanic crust dehydrate.

Receiver function analysis is used to estimate the shape and the depth of the subducting plate. For example, Shibutani et al. (2013) estimated the structure of the Philippine Sea plate beneath Kii Peninsula by linear array observation. Ueno et al. (2008) estimated the depth of Philippine Sea plate and Moho discontinuity beneath Chugoku and Kinki region. However, They used only permanent seismic stations. It is hard to compare with local heterogeneous structure. On the other hand, dense seismic observation network has conducted since November 2008 in the northern Kinki region. We have observed with 170 seismic stations. The interval between stations is about 5 km. Thus, we can do receiver function analysis with high resolution by using the data obtained from this dense seismic observation network. Sasaki (2011) did preliminary analysis with 56 seismic stations. In this presentation, we show the shape and the depth of seismic velocity discontinuity by receiver function analysis, and discuss the relationship between the shape and the depth of seismic velocity discontinuity and the distribution of the S-wave reflector by Aoki et al. (2013).

Keywords: receiver function