Configuration of the subducting Philippine Sea slab estimated from RF and refraction analyses in SW Japan

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1. Introduction

The configuration of the subducting plates has been estimated from seismic activity. The method is not useful at aseimsic regions. The receiver function analysis is useful for the estimation of the seismic structure at the aseismic regions because the far field earthquakes are used. In SW Japan, the receiver function analysis has been used for the estimation of the configuration of the plate (e.g.,Yamauchi et al.,2003; Shiomi et al., 2004; Ramesh et al.,2005; Ueno et al., 2008a, 2008b) . The configuration of the subducting Philippine Sea slab estimated from receiver function analysis was bent at the eastern part of the SW Japan. The model was not consistent with that obtained from tomography studies (e.g., Hirose et al., 2007). It is very important to know the configuration of the slab for simulation studies. In SW Japan, several seismic experiments have been done (Kurashimo et al., 2002, 2004). In this study, the seismic images obtained from receiver function analysis are compared with that of refraction study. The configuration of the subducting Philippine Sea slab is researched.

2. Data

The seismic stations of Hi-net, JMA, and ERI are used. The earthquakes occurred from Aug., 2002 to Oct., 2007 are used. The magnitude of the earthquakes are larger than 5. The seismic data with the epicentral distance of 30 deg -90 deg are used.

3. Results

The images obtained from receiver function analysis were consistent with the seismic structure obtained from refraction study. The previous model which was obtained from receiver function studies indicated that the Philippine Sea slab was bent at the eastern part of Shikoku. However, this model suggests that the Philippine Sea slab is not so distorted at the region. This model is consistent with that of seismic tomography results. The leading edge of the subducting slab can be traced to the depth of 40 km at least. The clear boundary could not be detected at the area that the clear reflector was obtained by Nishida et al. (2002) beneath the source area of 2000 western Tottori earthquake.