Low velocity structure beneath Kyushu island, Japan, inferred from Receiver functions.

Takuya Ueda[1], Hiroshi Takenaka[1], Takumi Murakoshi[2], Taro Okamoto[3]

[1]Kyushu University, Japan, [2]National Defense Academy of Japan, Japan, [3]Tokyo Institute of Technology, Japan

E-mail: 2SC12120N@s.kyushu-u.ac.jp

The Kyushu island, Japan, there are many active volcanos, for example, Aso, Kirishima, and Sakurajima volcanos along with the volcanic front, and Unzen volcano located far from the volcanic front. Information on structures beneath active volcanos is very important, and many researchers have revealed the structures under the active volcanos. Receiver function analysis is a useful tool to image the seismic velocity structures. We apply it to image the Kyushu volcanic area. In this study, we use teleseismic records from Hi-net and F-net seismic stations in Kyushu, which are supplies by the National Research Institute for Earth Science and Disaster Prevention. When those seismic stations are located at the top or in the sedimentary layer, the records include strong effect of reverberation within the sedimentary layer, which makes the image of the structure unclear. To overcome this problem, we exploit the modified S-wavevector receiver functions (SWV-RFs) [Takenaka and Murakoshi, 2010, SSJ]. The SWV-RFs is derived by deconvoluting the upgoing S-wave component with the upgoing P-wave component of the records [Reading et al., 2003, GRL]. For suppressing the sedimentary layer effect, we virtually move the seismic sensor to the top of the basement layer, and calculate the SWV-RFs at that location [Takenaka and Murakoshi, 2010]. This method needs the structure model from the surface to the sensor location. We employ the Integrated Velocity Structure Model by the Headquarters for Earthquake Research Promotion. We take several cross sections in Kyushu island to map the calculated SWV-RFs. We then interpret the continental Moho, the Philippine Sea Plate and low velocity regions in the mapped SWV-RFs. It can be seen that characteristic low velocity regions beneath the crust around volcanic area, some of which may be related to magma. We will also model some SWV-RF sections by the 2.5-D finite-difference method [Takenaka and Okamoto, 2012, InTech] to confirm our imaging results.