

Seismic attenuation beneath Tateyama volcano

IWATA, Koji^{1*} ; KAWAKATA, Hironori² ; DOI, Issei³

¹Ritsumeikan University, ²Ritsumeikan University, ³Disaster Prevention Research Institute

Tateyama volcano (Midagahara volcano) locates in southeast Toyama prefecture. Subsurface structures beneath active volcanoes have frequently been investigated using seismic attenuation (e.g., Oikawa et al., 1994; Sudo et al., 1996), and it was reported that there are strong attenuation regions beneath some active volcanoes. The volcanic activity of Tateyama volcano is quite low, and subsurface structure beneath the volcano has not been investigated in detail. Since Hi-net was developed by NIED, the attenuation structure of whole area of Japan has been estimated (e.g., Jin and Aki, 2005; Carcole and Sato, 2009). However, local structure beneath inactive volcanoes is still in question. In this study, we investigated the seismic attenuation beneath Tateyama volcano using seismograms obtained by Hi-net.

In this study, we used seismograms of five Hi-net stations near Tateyama volcano. The seismograms were selected so that epicentral distances from Tateyama volcano were 70 km~140 km, the magnitudes of the earthquakes were larger than 2.5, focal depths were less than 30 km, and signal-to-noise ratios were sufficiently high.

At first, we focused on the two stations which locate opposite sides of Tateyama volcano each other, and compared seismograms whose epicenters were located almost along the line of Tateyama volcano and the two stations. For the seismograms which passed beneath the volcano, S-waves were more attenuated than P-wave. In detail, S-wave attenuation was pronounced in 4~8Hz and 8~16 Hz bands. This feature was seen in all seismograms from northwestern or southeastern sources. On the other hand, seismograms from northeastern or southwestern sources did not show such a feature. There should be a region that preferentially attenuated S-waves beneath Tateyama volcano, and the distribution is heterogeneous.

Also, it should be noted that S-waves passing beneath Tateyama volcano showed clear peak delay, which suggested that there was a region with high scattering attenuation beneath Tateyama volcano.

Keywords: seismic attenuation, volcano, spectral analysis