

Active Seismic Exploration at Kusatsu-Shirane Volcano – P-wave Velocity Structure –

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Mt. Kusatsu-Shirane is one of active volcanoes in Japan and located in NW part of Gunma prefecture. In the historical time, the activities are characterized by geothermal activities such as fumaroles and hot springs, and frequent phreatic explosions. In order to understand physical properties of host medium and physical condition at the location of these volcanic activities, an active seismic exploration was conducted in 2003. The purposes of the experiment were mapping of reflectors and revealing seismic velocities around crater lake 'Yugama' in the summit area and constraining regional velocity structure. In this presentation, we report P-wave velocity structure analysis revealed by the exploration data.

Chemical explosions were detonated at three locations. Two dynamite shots with charges of 5 kg were detonated about 1 km SE and NE of summit crater (S1 and S2) and the other with charges of 30 kg was about 6 km east of Yugama (S3). The seismic records by the explosions were recorded by about 100 permanent and temporal seismic stations.

We picked first arrivals from the seismic records and made first arrival time dataset to investigate P-wave velocity structure. From a traveltimes plot of S3, increasing of apparent velocity is recognized as increasing hypocentral distance. This indicates increasing of velocity toward depth direction. Apparent velocity near the S3 is about 2.5 km/s. This can reflect the seismic velocity within Oshi and Yazawahara pyroclastic flow deposits. Traveltimes plots of S1 and S2 in summit area show large apparent velocity compared to eastern flank area around S3. This large apparent velocity is due to stiff lava flows such as Aoba lava and Kagusa lava.