# $V_{SV}$ and $V_{SH}$ structures beneath Asama volcano

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Recent studies report the existence of the discrepancy between $V_{SV}$ and $V_{SH}$ beneath volcanoes with large calderas such as Toba caldera (Jaxybulatov et al., 2014) and Yellow Stone caldera (Jiang et al., 2018) or volcanoes at the rim of large calderas such as Kirishima volcanoes. Such discrepancies imply the radial anisotropy generated by a sill complex in the magma reservoir. However, it is not clear whether this feature is common only among volcanoes related to large calderas. In this poster, we will present whether there is the same feature beneath a volcano without a large caldera taking an example of Asama volcano for comparison.

The technique we employed is seismic wave interferometry, which extracts the seismic wave propagation between two seismic stations by taking cross correlations of random wavefields, such as the ambient seismic noise or the seismic coda wave. The cross correlations of random wavefields recorded at two stations can be represented as if the source is at one station and the recorder is at the other. This technique is suitable for exploring local structure since the extracted wave is sensitive to the internal structure between the two stations.

We applied this technique to the ambient seismic noise data recorded at 46 seismic stations on and around Asama volcano between July 2005 and July 2007. Rayleigh and Love waves are extracted by taking cross correlations (Rayleigh waves from cross correlation functions of pairs of vertical components, and Love waves from transverse components). We derived the reference dispersion curves of Rayleigh and Love waves, respectively, using all possible pairs of stations, then measured phase velocity anomalies of all possible pairs with respect to the reference in multiple frequency bands (0.1-0.2 Hz, 0.15-0.3 Hz, 0.2-0.4 Hz, and 0.25-0.5 Hz).

The phase velocity maps of Rayleigh and Love waves were obtained by the surface wave phase velocity tomography (Rawlinson and Sambridge, 2005). The phase velocity map of Rayleigh waves in 0.1-0.2 Hz shows a low velocity region in the western part of the volcano. In the frequency bands higher than 0.15 Hz, low velocity regions exist beneath the entire volcano. The phase velocity maps of Love waves exhibit low velocity regions beneath the entire volcano in all frequency bands. Moreover, the intensity of the low velocity is relatively stronger on the east side of the summit crater. We plan to construct the three-dimensional $V_{SV}$ and $V_{SH}$ structures inverted from the phase velocity maps of Rayleigh and Love waves, respectively, by the linearized inversion (Tarantola and Valette, 1982).

Keywords: Asama, magma reservoir, radial anisotropy

 