

## Simultaneous inversion of muon radiography and gravity anomaly data for 3-D density structural analysis of lava domes

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Cosmic-ray muon radiography (muography) has been utilized for obtaining the density profiles of volcanoes (eg. Tanaka et al., 2007; Lesparre et al., 2010; Cârloganu et al., 2013). Since gravity measurement is also sensitive to the internal density of the Earth, a combination of muography and gravimetry is expected to provide density profiles with fine resolutions (Okubo and Tanaka, 2012). Nishiyama et al. (2014) has developed a simultaneous inversion method of both two data for determining the 3-D density structures of volcanoes and has presented the feasibility of the hybrid measurement through a case study of a small (500 m in diameter) lava dome, Showa-Shinzan, Hokkaido, Japan. This study revealed that a vent extends downward beneath the dome.

We are now planning another hybrid measurement at Tarumai Lava Dome on the Shikotsu caldera, Hokkaido, Japan, in order to perform a comparative study on the internal structures of lava domes. The Tarumai lava dome has formed at the top of Mt. Tarumai during the 1909 eruption. We conducted gravity measurements at 23 stations spanning 1.5 km (NS) x 1.5 km (EW). We are preparing the muography detector for the coming measurement. We report the possible detector sites and the result of the resolution test of this new hybrid measurement.

### References:

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