

## Preliminary resistivity structure model around Kusatsu-Shirane Volcano revealed by broadband Magnetotellurics

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Kusatsu-Shirane Volcano (KSV) is the active volcano known for its significant hydrothermal activity and producing phreatic eruptions in recent years. A number of geochemical and geophysical studies, conducted around the present active eruption center (Yugama), have been revealed the shallow hydrothermal system mainly around the crater. By geological studies, there were also frequent magmatic eruptions at Mt. Motoshirane, a different pyroclastic cone from that which hosts Yugama, until 1500 years ago. Therefore, it is expected that the magma produced at that time has not yet cooled and solidified. However, the positional information of a magma chamber is still unknown because of lack of deep structural information. Knowing the subsurface structure such as the spatial distribution of the magma-hydrothermal system is essential to discuss the present volcanic activity and the future eruption risk.

As a first step to reveal the whole image of the magma-hydrothermal system of KSV, broadband magnetotelluric (MT) observations centered on Mt. Motoshirane were conducted in 2015 and 2016 (Matsunaga et al., 2020). The 3-D electrical resistivity structure model revealed an extensive low-resistivity layer which was interpreted as a hydrothermal reservoir supplying fluids to the active crater at depths of 1–3 km beneath the summit area. However, no structural features suggestive of the presence of magma have been found beneath this layer. This is because the resolution of the structure deeper than 5 km was not sufficient.

In 2019, we conducted new MT observations covering the entire edifice of KSV. By expanding the observation area to a wider range, it is expected that a more reliable deep resistivity structure will be obtained. In the presentation, we are going to present an improved 3-D resistivity structure of KSV inferred using both new and old MT data, and to discuss the spatial distribution of the magma-hydrothermal system.

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