

## Imaging of a vapor reservoir at Kusatsu-Shirane volcano, by 3D-MT inversion

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We have carried out total of 85 MT and AMT soundings in the summit region (2kmx2km) of Kusatsu-Shirane volcano from 2001 to 2006. This volcano is known to have phreatic eruptions but the knowledge about the underlying structure was limited to the existence of volcanic tremor sources. For phreatic eruptions, the capping structure of the vapor or geothermal fluid is very important. We believe that the electrical imaging of the volcano is one of the best methodologies. The regional profiling of the volcano (Nurhasan et al., 2006) showed wide-spread conductors at the flanks of the volcano which are mostly interpreted as hydrologically-impermeable and electrically-conductive clay-rich layer.

Regarding the summit area, Nurhasan(2006) modeled three dimensional structures by using Mackie's forward code. In the present paper, we inverted our dataset by the 3d inversion code of Siripunvaraporn et al.(2005) using full impedance components. The major features of the faults are bell-shaped capping structure of the conductive clay around the Yugama-Mizugama craters. The capping conductor has a thickness of 200-500m in the central part of the cap and 2km in the surrounding region. In particular, the thinnest part of the conductor corresponds to the surface manifestations of the active gas venting. The relocated micro-earthquake foci using borehole seismic network also showed good correlation of the capping structure. The micro-earthquakes are found only within the bell-shaped capping conductors.