

Resistivity structure around Chishinshan volcano area in Tatun Volcano Group, northern Taiwan, revealed by AMT surveys.

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The active volcanoes have the low resistivity region beneath the edifices; that is because high- salinity and temperature hydrothermal fluids dramatically decrease the resistivity of the pore water and rock matrix, when the volcanic fluids are released from magma and injected into the aquifer. The spatial extent of the low resistivity region could evaluate the eruptive potentiality of volcanoes from the viewpoint of magma degassing.

Tatun Volcano Group is composed of over twenty volcanoes, which were formed within the graben at the northern part of Taiwan. Recent geological, geochemical, and seismological studies have suggested the presence of potentially eruptive magma. Vigorous heat discharge from fumaroles and springs also suggests a large amount of the volcanic fluids released from magma beneath Chishinshan volcano. Utsugi et al. (2012) conducted AMT surveys at the volcano for a better understanding of this magma degassing, and showed the preliminary resistivity structure suggesting the low resistivity region at the depths of 1-2km.

On the basis of their work, the authors conducted further AMT surveys around Matsao hot spring and Tayukeng fumarole areas, about 2 km northeast of the volcano. First of all, the spatial extent of the rotational-invariant apparent resistivity was estimated, using the both data obtained by the authors in 2012 and Utsugi et al. (2012) in 2011. At a several thousands Hz, the low resistivity areas of 10-30 Ohm-m are found separately at Lengshueiken, Matsao, and Tayukeng. At a several tens Hz, the above three low resistivity areas are connected to each other, and the extremely low resistivity area less than 3 Ohm-m emerges near the central part of Chishinshan volcano. These features suggest the hydrothermal fluids are flowing from the central area of the volcano toward Lengshueiken, Matsao, and Tayukeng areas. In the presentation, the estimated two-dimensional resistivity structures beneath three areas will be shown.