栗駒火山昭和湖周辺における AMT 観測

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AMT measurements around Lake Showa, Kurikomayama volcano, northeast of Japan

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Resistivity is one of important physical parameters in order to research underneath structure of active volcanoes. The existence of volcanic fluid like as geothermal hot water and magma is closely related to the resistivity and conductivity (conductivity is the reciprocal of resistivity). MT (Magnetotelluric) method which is making use of natural electromagnetic variation is especially useful to estimate the subsurface resistivity and to investigate the volcanic structure. AMT is one of MT methods using the electromagnetic wave ranging the audio-frequencies and its exploration depths are from a couple of hundred meters to several kilometers. Since exploration depths of AMT are thought to most important active zone of volcanic fluid, AMT method and auxiliary using of wide-band MT method are recently expected to figure out the structure and to monitor the volcanic activity.

Now we focus the Kurikomayama volcano closely at the triple junction of borders of Akita, Iwate and Miyagi prefectures, northeast of Japan. Kurikomayama volcano is one of important active volcanos and its most recent striking activity was a phreatic eruption in 1944. The site of 1944 eruption is now remained as a crater lake called Lake Showa. Besides the Lake Showa, upstream of a gorge called Jigoku-dani and volcanic gas is even now emitted there.

We installed several AMT sites on the volcanic body of Kurikomayama volcano and one of sites is alongside Lake Showa and Jigoku-dani. We just collected the time series of geomagnetic and telluric date of AMT and report the characteristics of primary data and initial analyses using phase tensor, induction arrow, one- and two-dimensional structure analysis.

So far the several researches of 2- and 3-dimensional resistivity structure of the crust including Kurikomayama volcano have been reported (for example Mishina, 2009; Ichihara et al., 2014). Mishina (2009) firstly report the 2-dimensional resistivity structure targeting the deep volcanic fluid beneath the Kurikomaya volcano. The result of Mishina (2009) suggested the existence of volcanic fluid at the depth of several kilometers under the volcano. Our research target is shallower depth than the research of Mishina (2009) and the purpose is the volcanic structure and the fluid related to phreatic eruption.