

Magnetotelluric monitoring at Sakurajima volcano, Japan

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In order to detect the temporal change of the resistivity structure, broad-band magnetotelluric (MT) measurements were conducted from February to July, 2010 at Sakurajima volcano. Six observation sites were established at locations approximately 2-3 km away from the summit crater. By using a Metronix ADU07 system, electric and geomagnetic data were recorded everyday at a sampling frequency of 32Hz (15:00-20:00 UT), 1024Hz (17:00-18:00UT), and 32768Hz (23:10-23:11 UT). By applying the comb filter to reduce the 60 Hz noise and its overtones, we obtained the monthly MT response functions in the frequency range of 10,000-0.001 Hz. Temporal change of MT response function was observed at frequencies higher than 1 Hz. This result is consistent with the previous observations at Sakurajima volcano by using Phoenix MTU5 systems (Aizawa et al., 2011, JVGR). Temporal change was found on not only on the impedance but also on the geomagnetic transfer function. On the other hand, no significant change beyond error bars was observed at lower frequencies. To explain the temporal change of the MT response functions, we performed 3D inversion by using the code WSINV3DMT (Siripunvaraporn and Egbert, 2009). First, we obtained the high-quality MT response functions by stacking all MT data. Then, reference 3-D resistivity structure was estimated by a 3-D inversion. Second, inversions for the temporal change were performed by setting the reference model as an initial model of each inversion. In this presentation, we will show the 3D resistivity structure of Sakurajima volcano, and its temporal change.