Shallow resistivity structure of Kuju volcano, central Kyushu

Yasuaki Okada[1]; Wataru Kanda[2]; Mitsuru Utsugi[3]; Yoshikazu Tanaka[4]; Hiroyuki Inoue[5]; Shogo Komori[1]; Itsuo Azuhata[6]; Ken'ichi Yamazaki[7]; Ryokei Yoshimura[8]; Naoto Oshiman[8]

[1] Earth and Planetary Sci.,Kyoto Univ; [2] DPRI,Kyoto Univ; [3] Kyoto Univ.; [4] Aso Volcanological Laboratory Kyoto Univ.; [5] AVL, Kyoto Univ.; [6] none; [7] Science., Kyoto Univ; [8] DPRI, Kyoto Univ.

On October 11, 1995, a phreatic explosion occurred at the eastern flank of Mt. Hossho which is located at the central part of Kuju volcano, central Kyusyu, Japan. Intense fumarolic activities had continuously observed since then and eruption with ash ejection occurred in December again. Fumarolic activity has still been vigorous until now around Mt. Iwo situated at the north-eastern flank of Mt. Hossho. Continuous measurement of the geomagnetic total intensity has been made by Kyoto University after 1995 eruptions. Observed geomagnetic variations show remarkable decrease at sites located north of Mt. Iwo while corresponding increase is seen at sites located south of Mt. Iwo. Those variations were interpreted that volcanic rocks just beneath the present fumarolic area have been increasing their magnetization, implying that the shallow edifice has been cooled.

We carried out an AMT survey at the summit area of Kuju volcano during a period from August 17 to 24 in 2005 in order to estimate the current state of the shallow structure inside the volcano after eruptions in 1995. We measured 3 components of the geomagnetic field and 2 components of the electric field over the frequency range from 10400(Hz) to 0.3(Hz) by using 4 MTU-5A systems manufactured by Phoenix Geophysics. Measurement sites were located at intervals of about 300-500m and AMT data were recorded for 11 hours at night. We set up two main profiles of NW-SE and NE-SW directions focused on the present fumarolic area. Taking a future three-dimensional interpretation into account, several additional sites between the main profiles were also installed. The total number of the AMT sites was 21. Sounding curves were estimated from two steps: 1) a remote reference processing using two sites inside the observation area, then 2) removal of unusual values by a manual editing. Since the data obtained on August 18 were not of good quality.

As a preliminary result, we obtained a two-dimensional resistivity model using the inversion code of Ogawa & Uchida (1996) assuming the 2-D strike direction to be NE-SW. The model showed that a low resistivity was widely seen over the shallow part of the volcano, although relatively high resistive zone was found at the depth of about 1km around Mt. Hosso toward Mt. Iwo where phreatic explosions occurred in 1995. In the presentation, we will discuss about the relationship between these characteristic resistivity distribution and the present volcanic activity.