

SEM037-03

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## Shallow resistivity structure of Sakurajima volcano - Re-analysis of the audio-frequency magnetotelluric data

Wataru Kanda<sup>1\*</sup>, Yasuo Ogawa<sup>1</sup>, Koki Aizawa<sup>2</sup>, Shinichi Takakura<sup>3</sup>, Sakurajima Volcano EM field experiment group<sup>4</sup>

<sup>1</sup>VFRC, Tokyo Institute of Technology, <sup>2</sup>ERI, University of Tokyo, <sup>3</sup>Inst. Geo-Resour. Env., AIST, <sup>4</sup>Universities and AIST

The 10th joint observation campaign of Sakurajima volcano was carried out under the framework of the 7th national project for prediction of volcano eruptions in 2007 fiscal year. Sakurajima volcano EM field experiment group (SVEMG) investigated the shallow resistivity structure by using the AMT (audio-frequency magnetotelluric) method as a part of the joint observation campaign, and presented the inferred 2-dimensional resistivity structure in the Japan Geoscience Union Meeting 2008 (SVEMG, 2008). However, the consideration of the resistivity structure was insufficient because a preliminary analysis had been made to data processing. As we made re-analysis of the data, we report on the result.

The measurement was done on Oct. 30th through Nov. 4th, 2007. Because the explosive Bulcanian eruptions often occur at the craters of Minami-dake that is a summit of Sakurajima volcano, we measured the electromagnetic fields at the frequencies of 1 to 10400 Hz along the three lines set on the northern, western, and southeastern flanks of the volcano. The observation sites were 27 in total. Because the measuring frequency is 1-10400Hz, information on the resistivity structure from the vicinity of surface to the depths of 1-2km can be obtained. The data quality was mostly good. The analysis was done by using the data of the frequency range between several thousand and 2Hz except a few sites.

As a result of the preliminary analysis, features of the following resistivity structures were clarified. The surface layers showed high resistivity (100-1000 ohm-m), probably corresponding to the lava. A low resistive layer of several ohm-m was widely found over the volcanic edifice at depths of 200 to 1000m, which would reflect a fracture zone filled with seawater. This conductive layer is likely to be deep beneath areas in the southwestern part of Sakurajima between the Nabeyama pumice cone erupted in 764, and the crater that effused lavas in 1914. Contrary, such depression of the conductive layer was not found around the Taisho crater located on the western flank.

These results were obtained from two-dimensional inversions, where the strike direction of the 2-D structure was assumed in the direction of each measurement line. However, the strike directions presumed by Groom-Bailey Decomposition showed almost north-south against all three lines. It means that two-dimensional strike was assumed in a direction almost orthogonal to a particular measurement line. Because three lines were set to surround the volcanic edifice, a three-dimensional analysis is necessary to explain all the data set without contradiction. Based on these, we will report a result of three-dimensional analysis of the data.

Keywords: resistivity structure, Sakurajima volcano, hydrothermal system