

## Results of time domain electromagnetic survey in Unzen Volcano, Kyushu, Japan

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Controlled-source time domain electromagnetic (TDEM) experiments were conducted around the Unzen Volcano in March 2000 and March 2001. The objective of these experiments is to image the resistivity structure of the area particularly around Fugendake and its eastern part near the Mayuyama, Shimabara. The method works in volcanic area mostly because volcanoes usually have high resistivity contrast due to interaction between the dry and resistivity host rock and the hot, moisturized, conductive magma reservoir and the hydrothermal system associated with it. Therefore knowledge about the resistivity structure beneath an active volcano will give a better understanding on its magmatic and hydrothermal system. This study is part of the Unzen Scientific Drilling Project (USDP).

Result of TDEM survey in Unzen Area has been reported by Kanda (1997), giving more information to the previous results of extensive survey using ULF, VLF, and ELF-MT (Kagiya, et al., 1992; Utada et al., 1994). The last measurement in 2001 is the first attempt to reveal the shallow part of resistivity structure of eastern Shimabara between Fugendake and Mayuyama. Results of the eastern part indicate the existence of the resistive surface layer and low-resistive second layer associated with water saturated layer, and tendency of the moderately more resistive third layer. This is in agreement with the previous results of electromagnetic investigation (e.g. Kagiya et al., 1992; Kanda, 1997). Low resistivity zone is found around Unzen Spa and Fugendake (beneath the summit) extending to the north-east direction. The resistivity value tends to increase eastward from the summit and this is probably due to the increasing distance from the source. The low resistivity distribution also spreads wider with depth, indicating the effect of water-saturated layer. Conductive zone is also clearly seen in the area west from the Tachibana bay, within the active volcanic graben associated with the focal area of the earthquakes.