

MAGNETOTELLURIC TRANSECT OF THE UNZEN GRABEN

*Agnis Triahadini¹, Koki Aizawa², Dan Muramatsu¹, Kaori Tsukamoto¹, Keita Chiba², Saki Watanabe¹, Yui Odasaki², Makoto Uyeshima³, Yoshiko Teguri²

1. Department of Earth and Planetary Sciences, Graduate School of Sciences, Kyushu University, 2. Institute of Seismology and Volcanology, Faculty of Sciences, Kyushu University, 3. Earthquake Research Institute, The University of Tokyo

Unzen volcano is grown in the center of East-West (E-W) trending graben structure resulting many normal faults with same trend direction. In order to investigate shape and physical properties of faults and magma conduit based on electric resistivity structure, a magnetotelluric (MT) survey was employed North-South (N-S) direction line crossing Unzen graben. In the same survey line, seismic reflection survey by Matsumoto et al (2012) was previously conducted, and they imaged faults and more importantly the possibly inclined conduit that may be related to the 1991-1994 eruption of Unzen volcano.

In April-May 2017, we installed 4 magnetotelluric and 23 telluric stations along approximately 9 km N-S trending survey line with distance between each station is 300 m-400m. Then, we recorded the electromagnetic field variations approximately for one week. Resistivity model by 2-D inversion shows good coincidence with the seismic reflection profile. In this case, high resistivity zone is correlated with low reflection zone in the possible conduit region. However this correspondence should be carefully investigated, because the phase tensors (Caldwell et al., 2004) and induction vectors behaviour indicate 3-D structure in the deeper region. We will conduct 3-D inversion to confirm the relationship between electrical resistivity and seismic reflection, and discuss the physical property of structure beneath Unzen graben.

Keywords: Graben, Conduit, Faults, Resistivity, Magnetotelluric, 3D structure