One-dimensional resistivity structure of Iwo-yama, Kirishima Volcanoes

*Kaori Tsukamoto[1], Koki Aizawa[2], Mitsuru Utsugi[3], Takao Koyama[4]

1.Department of Earth and Planetary Sciences,Graduate School of Sciences,Kyushu University, 2.Institute of Seismology and Volcanology,Facurity of Sciences,Kyushu University, 3.Aso Volcanological Laboratory,Kyoto University, 4.Earthquake Research Institute,University of Tokyo

Iwo-yama is the youngest volcano in the Kirishima volcanic group, Kyushu Island, Japan. The volcano was formed at the eruption in 16~17th century (Tajima et al., 2014). Around Iwo-yama and Karakuni-dake, tectonic earthquakes have increased at a depth of 1 to 5 km since December 2013, and volcanic tremors have occasionally occurred since July 2015 (Japan Meteorological Agency, volcanic activity commentary document). Furthermore, the fumarolic gases at a temperature of 80℃ appeared on 14 December 2015 for the first time in 12 years, at the southwest of the crater of the Iwo-yama. The leveling survey detected the ground uplift during June to December 2015, and its pressure source was estimated at a depth of 700 m, the eastern part of the crater (Matsushima et al.,2015). The top of the hypocenters of tectonic earthquakes seems to be located at a depth of 1 km around the Iwo-yama, where the electric conductive clay layer was estimated by the previous resistivity structure investigation (Aizawa et al., 2013, EPS). From these evidences, we speculate that the supply rate of high temperature fluids beneath Iwo-yama has increased, and causes the increase of pore pressure beneath the clay layer, resulting in the increase of earthquakes. In order to examine this hypothesis, we conducted the broadband (200~0.0005Hz) magnetotelluric measurements around the Iwo-yama. From 21 December 2015 to 12 January 2016, we recorded two components of electric fields at 5 observation sites around the crater, and five components of electric and magnetic fields at an observation site located 500 m northeast of the Iwo-Yama. In this presentation, we will show the average one-dimensional resistivity structure of Iwo-yama, and will discuss the association with the earthquakes.

