

3-D resistivity structure of Tarumai volcano using MT method

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Tarumai volcano is an active volcano located in the northern part of Southwest Hokkaido. It generated a lava dome in the summit crater during magma eruption in 1909. Since then, volcanic gas activity continues around the dome up to the present. After 2003 Tokachi-Oki earthquake, emitting gas activity activated in southwest fumarole group at lava dome (Terada et al., 2004), and low frequency earthquakes occurred. It is considered that the crustal fluid participates (Aoyama et al., 2004). These facts suggest the existence of the hydrothermal system or aquifer below Tarumai volcano. Applying resistivity sounding, we may detect such crustal fluid as a conductive body. In Tarumai region, we performed a wide-band MT survey in 2004 and as a result of two-dimensional structure analysis, a low resistivity body less than 10[Ohm-m] was detected in the vicinity of sea level below the summit (Yamaya et al., 2004). To grasp volume and position of this conductor, it is required to model a 3-D structure. However, in 2004 survey, the number of sites was lack for 3-D modeling. Therefore, we carried out wide-band MT survey in June and July 2005. Processing the remote reference and manual editing, we obtained the MT data from 23 sites. To estimate regional structure, we calculated induction vector as a forward modeling assuming simple 3-D resistivity model structure including the ocean and Ishikari plain located in the east of Tarumai volcano. Since it is clarified that Ishikari plain has low resistivity (less than 10[Ohm-m]) from surface to a few kilo meters (Mogi et al., 2000), it may affect induction vectors observed in this region. As a result, calculated induction vectors pointed to southeast at frequency 0.1 - 0.01 Hz, and east at 0.001 Hz. These directions coincide well with observed induction vectors. Therefore, to discuss the resistivity structure of Tarumai volcano it is required the 3-D analysis including the detailed influence of the ocean and Ishikari plain.