メッシュ状に配置したNetwork-MTデータによる阿蘇カルデラと雲仙火山の地下の3次元比抵抗分布

畑 真紀 [1]; 上嶋 誠 [2]; 田中 良和 [3]; 橋本 武志 [4]; 吉村 令慧 [5]; 大志万 直人 [5]
[1] 東大・地震研; [2] 東大・震研; [3] 京大; [4] 北大・理・地震火山セ; [5] 京大・防災研

3-D electrical resistivity models beneath two active volcano groups in a graben by Network-MT data of reticular arrangements

Maki HATA[1]; Makoto Uyeshima[2]; Yoshikazu Tanaka[3]; Takeshi Hashimoto[4]; Ryokei Yoshimura[5]; Naoto Oshiman[5]
[1] ERI, the University of Tokyo; [2] ERI, Univ. Tokyo; [3] Kyoto Univ.; [4] ISV, Hokkaido Univ.; [5] DPRI, Kyoto Univ.

Mt. Aso with a large caldera and Mt. Unzen, which are composed by active Quaternary volcanoes, lie at the Beppu-Shimabara graben. The graben travels across the island of Kyushu almost in an E-W direction. Aso caldera was formed at the central part of the graben by a series of huge eruptions, with a volcanic explosivity index of 7, during 270-90 ka. A post-caldera cone of Naka-dake in Aso caldera is a quite active volcano, which experienced magmatic and phreatomagmatic eruptions that spewed volcanic ash at a maximum height of 11,000 m into the air during 2014-2016. On the other hand, Unzen, a back-arc volcano at the western edge of the graben showed a dome-forming eruption at Fugen-dake cone during 1990-1995, preceded by a significant eastward migration of volcano-tectonic seismicity from Tachibana bay to the summit. The total amount of extruded dacitic lava was $2*10^8$ m^3 DRE, and the repetitive partial collapses generated ~10,000 pyroclastic flows [e.g., Nakada et al., 1999; Yamamoto et al., 1993].

In and around Aso caldera and Unzen volcano, network-MT surveys for the electric field (the electric potential difference) were carried out during 1993-1998 by using long metallic wires/dipoles of the commercial telephone company's networks [e.g., Uyeshima et al., 1995; Tanaka et al., 1998; Hashimoto et al., 1999; Hata et al., 2015]. We determined two components of network-MT response functions between the potential differences for respective dipoles and the two horizontal components of the magnetic field at the Kanoya Geomagnetic Observatory. Three-dimensional (3-D) inversion analyses were performed by using network-MT data in a period range from 480 to 20,480 s for obtaining each electrical resistivity model beneath Aso caldera and Unzen volcano. In addition, the 3-D resistivity models for each volcano were obtained based on separate data sets of reticular dipole arrangement which respectively cover the two target regions. Through the 3-D inversion analyses, we used a data space Occam's inversion code modified for the network-MT data of long dipoles [e.g., Siripunvaraporn et al., 2004]. In this presentation, we show details of the respective 3-D resistivity models beneath Aso caldera and Unzen volcano.