R003-08
D 会場 ：11/5　PM2 （15:45-18:15）
16:00〜16:15

#相澤　広記 [1)], 井ノ又　伍 [1)], 北村　圭吾 [2)], 澤山　和貴 [3)], 大久保　歩夢 [4,5)], 安仁屋　智 [4,5)], 松島　健 [1)], 稲垣　陽大 [6)], 齋藤　博樹 [6)], 西島　潤 [2)]
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Low-resistivity zone between Kuju Iwo-yama volcano and Otake-Hatchobaru geothermal power plant

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The Kuju volcano group (Kuju Volcanoes), which is located in north of the Kyushu Island, hosts numerous geothermal zones. The delta13C and 3He/4He ratios of geothermal zones indicate that the magmatic fluid contributes to the volcanic and geothermal activities. Indeed, the phreatic eruptions, which occurred at Iwo-yama volcano on December 1995, contained significant amounts of vesiculated glass shards, suggesting a magmatic contribution (Nakada et al. 1996; Hatae et al. 1997). Otake − Hatchobaru power plant (120MW), which is the largest geothermal power plant in Japan, is located 4.5 km WNW of the Iwo-yama volcano. The recent magnetotelluric surveys (Aizawa et al. 2022) have imaged low-resistivity zone between Iwo-yama and Otake − Hatchobaru power plant deeper than 1 km below sea level (bsl), where the high temperature >250 degree is estimated from drilling data (Kitamura et al. in revision). Considering its location, the low-resistivity zone is possibly related to the magmatic fluid pathways for both of the Iwo-yama and the geothermal power plant. However, in the previous study, MT sites were not densely deployed near the low-resistivity zone, and the shape of the low-resistivity zone was not strongly constrained. The purpose of this work is imaging of the 3-D shape of this low-resistivity zone for discussing the relationship between Iwo-yama and the Otake-Hatchobaru power plant. For this purpose, we have acquired broad-band MT and telluric data at 53 sites around the low-resistivity zone on November to December 2021. Preliminary analysis with new and old data confirmed the presence of the low-resistivity zone. One of the new suggestions is that the low-resistivity zone is separated to shallower (0 to 2 km bsl) and deeper (below 3 km bsl) region. The shallower low-resistivity zone is elongated NW-SE direction, which is comparable to the fault strike near the Hatchobaru-Ohtake power plant. Along the southwestern edge of the shallower low-resistivity zone, two NW-SE trending faults are located. The deeper low-resistivity zone is located approximately 1 km northeastward relative to the shallower low-resistivity zone. Seismic activity is low in the deeper low-resistivity zone. In this work, we will show the 3-D resistivity structure and investigate its significance for volcanic activity of Iwo-yama and the geothermal resources of the Ohtake-Hatchobaru power plant.

References

Aizawa et al. (2022), Magmatic fluid pathways in the upper crust: insights from dense magnetotelluric observations around the Kuju Volcanoes, Japan, GJI, 228, 755-772.

Kitamura et al. (Geothermics in revision), Potential evaluation of supercritical geothermal systems in the Kuju region, central Kyushu, Japan.

Acknowledgement

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