

Density structure inferred from gravity and airborne gravity gradiometry data in the northwestern part of Kuju volcano, Oita prefecture

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There are many geothermal fields, hot springs and the geothermal power plants (Otake, Hatchobaru and Takigami) in the northwestern part of Kuju volcano, Oita prefecture. This area is included in the Hohi geothermal area. Many geothermal explorations have been conducted in this area since 1960. The gravity data which is measured by many institute, company and university was recorded in some gravity database. Moreover, an airborne gravity gradiometry (AGG) survey was conducted by the Japan Oil, Gas and Metals National Corporation (JOGMEC) in 2012 and 2017. The underground density structure is estimated by the gravity and AGG data inversion analysis using VOXI Earth modeling on Geosoft Oasis montaj. This result is integrated with the other geological, geophysical and geochemical data on the GIS software. Finally, the conceptual hydrothermal model is estimated by the integrated interpretation using GIS software. The high-density ($2400 - 2550 \text{ kg/m}^3$) areas were estimated below the middle and late Pleistocene volcanoes in the southern part of the study area at a depth of 0 to 2000 m below sea level. These high-density areas correspond to the distributions of the older Hohi volcanic rocks. Moreover, the depression structure was detected in the western side of Mt. Waita. Some hot springs (Yamakawa, Aozuru, Nuruyu and Tsuetate) are located on the edge of this structure.

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