

## Repeated aeromagnetic survey on Kuju Volcano using drone, unmanned multicopter.

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On Kuju Volcano, central Kyushu, Japan, the continuous and repeated magnetic observations had been performed since the phreatic explosion in 1995, and a remarkable temporal magnetic field change was observed, which is the increase of the magnetic total force on the south, and the decrease on the north, of the Iwoyama volcano, and this suggests the subsurface rocks were magnetized by cooling.

On this Volcano, Kyoto University conducted a high-density aeromagnetic survey around Iwoyama in December 2004. In this survey, an observation bird equipped with a magnetometer (G858 produced by Geometrix inc.) and GPS was towed by a helicopter, and magnetic anomalies (magnetic total force) were observed in 2 km x 2 km area around Iwoyama volcano with an altitude of about 150 m from the ground.

In Oct. 2019, we conducted aeromagnetic survey on this area using a unmanned multi-copter with the aim of detecting the temporal changes during 2004 to present. In this observation, the magnetic total force was measured using the drone aeromagnetic measurement system GSMP35U-DR of Tera Tecnica inc., which consists of a drone Matrice600pro (DJI), and potassium magnetometer GSMP-35U (GEM system inc.). In order to eliminate the noise generated by the drone, the magnetometer sensor was suspended for about 2.5 m, and the total force was measured at a sampling interval of 0.05 seconds. In addition, the data measured by GPS equipped with Matrice600pro was used as the position data.

Using this observation system, we conducted aeromagnetic survey in the part of the flight route in 2004, which is EW about 1 km, and NS about 2 km around Iwoyama. From the obtained data, we picked out the points whose distance between the nearest point of 2004 survey is less equal 20 m, and compared with their observed data. As a result, we detected the magnetic field change corresponding to the ground survey results, and it is suggesting that our repeated aeromagnetic survey had successfully detected a temporal change during 2004 to 2019.

At present, in order to further examine this results, a data analysis is being performed using an analysis method based on the mis-tie control method proposed by Nakatsuka et al. (2006). In this presentation, we will show the results of our data processing in detail.

Keywords: Kuju volcano, repeated aeromagnetic survey, drone