Applicability evaluation of the drone-mounted thermal infrared camera to geothermal monitoring at Sumikawa site, Akita Prefecture

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To understand the volcanic activity, it is important to monitor of earthquakes, crustal movement, geothermal activity throughout volcanic quiescence. Especially, the monitoring of geothermal activity is useful as a continuous observation, because the occurrence of high-temperature anomaly and change of heat discharge at the surface are closely related to the movement of magma and hydrothermal systems under the volcano, and also the monitoring of geothermal activity is simple, convenient and cost-effective compared with others.

This presentation would introduce a case study of thermal monitoring at the Sumikawa hot spring where a small phreatic explosion occurred in 1997. In particular, we observed the thermal distribution of the surface using a drone-mounted thermal infrared camera on the 18th October, 2015. And a temperature distribution map with high spatial resolution, roughly 5 cm, was generated from the data. This high resolution map would be made it possible for us to acquire the precise information of geothermal anomaly at the relatively small fumarolic area. Therefor, this method could complement the conventional observing approach of geothermal activity by performing repeatedly with proper timing.

Keywords: drone, geothermal monitoring, temperature distribution map, Sumikawa site

