

## On the recent thermal demagnetization beneath the Oana Crater, Azuma Volcano

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The Oana crater of which the diameter is about 200m is located in geothermal fumaroles zone at southeast slope of Mt. Is-saikyo, Azuma Volcano. In the recent years, a new 300m height fumarole named W-6 appeared inside the crater on November, 2008, and volcanic micro-tremors were observed after an interval of five years in 2010. It seems the recent hydrothermal activity beneath the Oana crater has been high level.

In order to monitoring hydrothermal activity beneath the Oana crater, a repeat measurement of the geomagnetic total force with 12 observation points has been carried out near the crater since 2003 by the volcanological center of Sendai district meteorological observatory cooperated with Kakioka magnetic observatory. Continuous secular variations in the geomagnetic total force have been observed within a 500m radius area from the center of the crater. Since the variation pattern is increasing at northern and decreasing at southern area of the crater, it suggests that demagnetization has been progressing beneath the crater. As the demagnetization occurred at geothermal active zone, we think it is a thermal demagnetization caused by hydrothermal activity.

A progressing rate of the thermal demagnetization beneath the Oana crater has been considered almost constant by analysis of secular variations in the geomagnetic total force up to 2010. However, on the observation on September, 2011, it is found that the trend of the secular variations at each observation point clearly changed toward acceleration of the thermal demagnetization. Depths of demagnetized sphere models estimated by annual secular variations up to 2010 are around 300m to 400m beneath the Oana crater, and radiuses are around 60m to 70m. On the other hand, the estimated depth is 500m and the radius is 108m on the model calculated from secular variations in the period from October, 2010 to September, 2011. This means the estimated annual volume of demagnetized source rapidly expands by five times during 2010 to 2011. We infer a something volcanic event happened beneath the Oana crater after October, 2010, and it caused raise up the hydrothermal fluid temperature.

Keywords: Azuma Volcano, geomagnetic total force, hydrothermal reservoir, thermal demagnetization, magnetic survey