Remarkable thermo-activities at Yoshioka hot spring, Aso volcano

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New thermo-activities are remarkably occurred at Yoshioka hot spring, 5 km west of Nakadake 1st crater, Aso volcano, Japan. The unusual thermo-activities include (1) increases in gas flux, (2) formation of fumaroles and steaming grounds, and (3) ash ejections.

Yoshioka hot spring was minor geothermal area that had only two hot water sources in 50 degrees at region 'A' and in 96 degrees at region 'D'. On April 2006, we found a new vent 'a3' with a new steaming ground at region 'A' that maximum temperatures were over 98 degrees. On August, a new vent 'b1' and new steaming grounds, 'B' and 'C', are formed. On October, gas fluxes of these fumaroles obviously increased, and the 'b1' ejected ash of 10 ton.

We applied the Plume Rise method to the sequential images of fumarole 'b1' obtained by automatic image recording system and show that the heat and water discharge rates were estimated approximately 15 MW and 6.7 kg/s (650 ton/day) on October 2006. On and after November 2006, heat and water discharge decreased to about 4.6 MW and 2.2 kg/s (210 ton/day) and surface of steaming grounds dried up. During the usual thermo-activities, the total weight of water discharge was estimated at 29,000 ton.

Our seismic observation revealed that episodic monochromatic tremors occurred beneath the region 'D', and the tremors caused by gas ejection from the vent 'b1' occurred continuously.

The heat discharge rate from 'b1' is over ten times as high as that of existing natural thermo-activities around geothermal area including Yoshioka and around geothermal area. We suppose that the formation of new fumaroles and steaming ground caused by the temporal increase of vapor flux from the deep geothermal hot water.