Temporal observation of seismicity and thermal activity in the Pago volcano 2002 eruption, Papua New Guinea

Akimichi Takagi[1], Kohichi Uhira[2], Mitsuhiro Yoshimoto[3], Ima Itikarai[4]

[1] MRI, [2] JMA, [3] ERI, Univ. Tokyo, [4] RVO, PNG

The Japanese Disaster Relief Team was dispatched to Pago volcano, New Britain, Papua New Guinea, during Aug 25 - Sept 3 in 2002, based on the friendly relations between PNG and Japan. The observation was being carried out, being supported by Rabaul Volcano Observatory (RVO), PNG, and governmental agencies of the both countries, including Japan International Cooperation Agency (JICA).

We report this physical observation associated with the eruption of Pago volcano briefly.

Thermal activity

Thermal anomaly was found along the lava and in and around the summit crater. The anomaly at the lowest crater was most distinct and maximum temperature of about 350 degree was observed there in the infra-red image. It indicates that vigorous upwelling of lava continues at the lowest crater. The lowermost part of the lava, the flow front, was also of a zone of high-temperature. As for the summit and the upper part of the lava, thermal activities are not as evident as that of the lower lava.

Seismicity

Seismic activity was stable but micro-earthquakes have occurred frequently during the period of seismic observation, although the measurement was limited only for about 48 hours. These magnitudes were from -1.0 to 0.5. About 10-30 small seismic events, mainly composed of high-frequency B-type earthquakes (BH events, predominant frequency of about 3-4 Hz and about 8-10 Hz), were detected per hour. The S-P time of about 1.5 second and polarity of first motions suggest that the seismic waves come from the direction of the lowest crater, possibly from the sources near the vents. Besides these BH events, there exist seismic events with more complex waveform. They might be a succession of BH events or attributed to rock fall events at the edge of the lava. No notable swarm type activity occurred during the observation. Background level was continuously high, and this amplitude has changed intermittently. It is unclear that this seismogram is the volcanic tremor. In addition to these, several tectonic earthquakes with the S-P time of about 5 - 12 second were detected.

We installed only one seismometer but, the S-P time and polarity of first motions suggest that the seismic waves come from the direction of the most active crater, where observed maximum temperature of about 350 degree by the infra-red imager. Lava has erupted continuously and calmly from the lowermost crater, and small earthquakes have occurred in the same way from there.