

Anomalous surface hydrothermal activities observed on September 19, 2022 at the south creaters of Kirishima Iwo-Yama volcano

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We used a self-contained system developed by the National Institute of Information and Communications Technology (NICT) for monitoring the hydrothermal activity of the southern craters of Kirishima Iwo-Yama volcano. A visual IoT and infrasound observation system has been deployed near the southern craters, and observations have been conducted since September 2022. Our system consists of a PTZ camera and an infrasound sensor, and it can be operated without maintenance for a long period of time with three power sources: solar cells, batteries, and methanol fuel cells. The real-time image transfer is realized by mobile communication with specific protocols. Thus, our system enables continuous video monitoring near the eruption vent. This time, anomalous hydrothermal activities on Y2a on September 19, 2022 observed by our system is reported.

Three eruption vents, Y2a, Y2b, and Y3, are active in the vicinity of the Kirishima Iwo-yama South Craters. Y2a shows the most active volcanic activity that ejects hot water during the hot water pool period, and active fumarolic activity during the dry season. long-term changes have been observed. However, on Sept. 19, 2022, anomalous short-term activities were observed. According to the high-resolution video data, there was a pool of hot water in Y2a until the evening of Sept. 18th, and a volcanic hot spring phenomenon was observed. However, Y2a eruption vent completely dried up and there are no fumarolic activity at around 6 am of Sept. 19. The fumarolic activity resumed around 6:19, and 3 minutes after that, the formation of a pool of hot water began, and a volcanic hot spring phenomenon was observed. After 7:15, the hot water pool started to disappear again, disappeared completely about 2 minutes later, and after about 3.5 hours, the fumarolic activity resumed, forming a hot water pool, and erupting again. This short-term change between the hot water pool phase and the dry phase was also observed in the 12:00 range. Such a short-term change was observed in Y2a so far only on Sept. 19, 2022. The day before this specific change was observed (September 18, 2022), a very strong typhoon No. 14 approached southern Kyushu area, and a record rainfall of 622 mm was observed at Ebino AMeDAS. The rapid increase in water content due to sever rainfall is considered to be one of the factors of this anomalous activities.

Keywords: Visual IoT, Kirishima Iwo-Yama, Anomalous surface hydrothermal activities