

Report of Volcanic Activity at Kusatsu-Shiranesan in 2018

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Kusatsu-Shiranesan is the active volcano located in north-eastern Gunma-pref. Japan Meteorological Agency (JMA) monitors Kusatsu-Shiranesan volcanic activity. A group of pyroclastic cones, including Shiranesan, Ainomine, and Motoshiranesan, which stretch from the north to the south, are located in its highest western area. Latest magmatic eruption occurred about 3,000 years ago. All recent eruptions were occurred in the area around Yugama and Motoshiranesan area, and these eruptions were phreatic explosions.

In January 2018, phreatic explosion occurred at Motoshiranesan area. In April, volcanic seismicity in shallow areas beneath the Yugama crater increased. We report volcanic activity at Kusatsu-Shiranesan in 2018.

A phreatic explosion occurred at 10:02 on 23 January 2018 at the northern and western area of Kagamiike-kita cone in Motoshiranesan. Before the eruption, volcanic tremor occurred from 09:59, and significant tilt changes which indicate the upward of Motoshiranesan direction was observed by tiltmeter installed around Yugama crater by the Tokyo Institute of Technology. At around 10:02, low frequency earthquake was observed, and these tilt signals turned to the downward to the Motoshiranesan direction. After the eruption, a very small volcanic earthquake (BH-type earthquake) occurred frequently in a shallow place near Kagamiike-kita cone, but it gradually declined.

In late April 2018, earthquakes around shallow part of Yugama crater rapidly increased, and crustal deformation indicating the expansion of the shallow part around Yugama began to be observed with the tiltmeter installed around Yugama crater. By the geomagnetic observation, the variation of geomagnetic total intensity indicating thermal demagnetization was observed from April.

In early September, the volcanic earthquake activity decreased somewhat and the tiltmeter variation also became smaller. But on September 28, again the earthquake around the Yugama increased rapidly. And crustal deformation similar to April was observed by the tiltmeter installed around Yugama. After that, earthquake activity decreased gradually, but continued in January 2019.

Analysis result of GNSS continuous observation date from 2014 to 2015, in which period seismicity around Yugama crater was high, indicates the expansion of the deep part of northwest area of Kusatsu-Shiranesan. Similar changes was observed at several observation points in 2018.

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Keywords: Kusatsu-Shiranesan, phreatic explosion, earthquake activity, ground deformation, variation of geomagnetic total intensity