

Volcanic activity at Kusatsu-Shiranesan Volcano since March 2014

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Volcanic seismicity became relatively high from early March 2014 at Kusatsu-Shiranesan. After that, the geomagnetic total intensity change caused by demagnetization process was observed, and Kusatsu-Shirane Volcano Observatory (Volcanic Fluid Research Center, Tokyo Institute of Technology; KSVO), also reported that the ground deformation and the change in chemical composition around Yugama (crater lake) had been observed corresponding to the increased volcanic activity. JMA raised the Volcanic Alert Level from 1 (Normal) to 2 (Do not approach the crater) on 3 June 2014, and urged to refrain from approaching up to 1 km away from the Yugama crater. On the basis of the volcanic activity described above, we report the observation data by JMA from March 2014.

Most volcanic hypocenters were located beneath and at the south of Yugama. A closer report on hypocenters is summarized in Matsuda et al., (2014).

Repeated GNSS measurements around Yugama revealed that inflated ground deformation was observed in 2014. Assuming a point source (i.e. Mogi-model), a ground deformation source was calculated at a depth of approximately 500m (elevation; approx. 1,700 m) on the north of Yugama, which is almost consistent with the analysis on tilt data (Terada et al, 2014) around Yugama installed by Volcanic Fluid Research Center. The ground deformation from July to November 2014 was calculated at slightly north of the one from September 2013 to July 2014. The analysis was performed by MaGCAP-V (MRI, 2013).

Kakioka Magnetic Observatory (KMO; Japan Meteorological Agency, 2014) reported the changes in geomagnetic total intensity observed from May 2014, which were estimated to be demagnetization beneath Yugama. This trend had become in a static state since July 2014. No changes in repeated geomagnetic total intensity observation were observed, indicating this demagnetization was significantly small in case.

Field observations were conducted on July and November 2014, and high-temperature areas and remarkable fumes were confirmed at geothermal areas at the northern wall of Yugama, and fumarolic areas on the northern slope of Yugama, where fumarolic activity had become high since 2008. We confirmed that the high fumarolic activity had been continuing in 2014. This activity was also confirmed by aerial observations in conjunction with the Gunma prefectural government and JGSDF (Japan Ground Self-Defense Force).

As described above, an inflated source existed around Yugama, deduced from geothermal activity with the highest activity from early May to July 2014 at Kusatsu-Shiranesan. We monitor the volcanic activity closely, in consideration of possible significant phenomenon.

Keywords: Kusatsu-Shiranesan, GNSS, thermal observation