

## Vertical ground deformation of Iwo-yama, Kirishima volcanoes measured by precise leveling survey (during Jun. 2015 - Oct. 2017)

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Iwo-yama of Kirishima Volcanoes is located in Ebino kogen volcanic area, southern Kyushu. In Iwo-yama, volcanic earthquakes and volcanic tremors come to occasionally occur from December 2013. Since December 2015, the fumarolic gas and the expansion of the thermal anomaly area are seen around the Iwo-yama area.

We estimate that the volcanic activity around the Ebino kogen is a new magma movement. We conducted the precise leveling survey in the Ebino kogen volcanic area for 9 times from June 2015 to October 2017 in order to clarify the position and the volume change of the pressure source.

Inflation of the Iwo-yama was detected since we initiated this survey to March 2016. After that, the uplift tendency remained almost level until February 2017. Based on June 2015, the maximum uplift of 17.2mm was observed at the benchmark closest to the Iwo-yama. From February 2017, subsidence has begun around the Iwo-yama.

We estimated pressure source models based on the vertical deformation. We assumed the presence of an inflation spherical source as Mogi's model. The optimum value of the variation was obtained by using MaGCAP-V software (Meteorological Research Institute, 2008) for analyzing crustal activity for volcano.

As a result, inflation spherical source has been inferred 150 m east of Iwo-yama's fumarolic gas area, the depth about 700 m. The lower limit of low resistivity layer assumed to be the clay layer is estimated in this depth (Aizawa et al., 2013).

Accordingly, the inflation source by using precise leveling survey is located under the impermeable clay layer. In addition, the increase of pressure source volume since June 2015 is maximum detected  $4.8 \times 10^4$  m<sup>3</sup> in November 2016. And it is presumed that the pressure source is currently the most contracted. The volume change of pressure source was similar to the vertical deformation obtained by the precise leveling survey. In this study, we found that the volume change of pressure source was fluctuating prior to the surface activity of Iwo-yama.

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