

精密水準測量で検出された霧島・硫黄山の上下変動(2015年6月～2017年10月)

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

*森田 花織¹、松島 健¹、手操 佳子¹、内田 和也¹、宮町 凜太郎¹、藤田 詩織¹、中元 真美¹、清水 洋¹、千葉 慶太¹、古賀 勇輝¹、森 濟²、村瀬 雅之³、大倉 敬宏⁴、井上 寛之⁴、横尾 亮彦⁴

*Kaori Morita¹, Takeshi Matsushima¹, Yoshiko Teguri¹, Kazunari Uchida¹, Rintaro Miyamachi¹, Shiori Fujita¹, Manami Nakamoto¹, Hiroshi Shimizu¹, Keita Chiba¹, Yuki Koga¹, Hitoshi Yamashita Mori², Masayuki Murase³, Takahiro Ohkura⁴, Hiroyuki Inoue⁴, Akihiko Yokoo⁴

1. 九州大学大学院理学府、2. 北海道大学、3. 日本大学、4. 京都大学

1. Kyushu University Faculty of Science, 2. Hokkaido University, 3. Nihon University, 4. Kyoto University

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 $4.8 \times 10^4 \text{ m}^3$ 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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