

SVC063-16

Room: 201B

Time: May 24 14:30-14:45

## Ground deformation around Sakurajima volcano and Aira caldera measured by precise leveling survey (from 2007 to 2009)

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We conducted the precise leveling survey that measures the leveling bench marks in Sakurajima volcano and around the Aira caldera in November 2009. In this paper, we report the results of this survey and discuss the ground deformation in and around Sakurajima volcano during the period of 2007-2009. From the obtained survey data, we calculated the relative height of each bench mark referred to the reference bench mark S.17 which is located at the western coast of Sakurajima. The calculated relative heights of the bench marks were then compared with those of the last 2007 survey, resulting in the relative vertical displacements of the bench marks. The resultant displacements indicate the ground uplifts at the northern part of Sakurajima, as observed by the repeated leveling surveys since 1996. The uplifts reflect the inflation of the deep primary magma reservoir beneath the Aira caldera, suggesting that the magma storage at the primary magma reservoir is progressed during the study period. The resultant displacements also show the ground subsidence near the central part of this volcano. This subsidence is thought to reflect the deflation of the magma reservoir that is located beneath the summit crater, caused by the recent increase of the volume of the ejected magma associated with the eruptive activity at the summit and Showa craters.

Keywords: Sakurajima volcano, Aira caldera, precise leveling survey, ground deformation