Ground deformation at Sakurajima volcano measured by precise leveling survey (1996 - 2006)

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We conducted the precise leveling survey that measures all the leveling bench marks in Sakurajima volcano, southwest Japan in June 2006. The last complete survey had been conducted in October 1996 (Eto et al., 1997), although some segments of leveling routes have been repeatedly measured after 1996. In this paper, we report the results of this survey and discuss the ground deformation at Sakurajima volcano during the period of 1996-2006. 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 1996 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 inferred from the results of the repeated partial surveys since 1996. The uplifts are thought to reflect the inflation of the deep primary magma reservoir beneath the Aira caldera, suggesting that the magma storage at the deep primary magma reservoir is progressed during the study period. Eto et al. (1997) pointed out that the magma storage began since around 1991 when the eruptive activity at the summit crater of Sakurajima volcano was gradually decayed.