Vertical ground deformation in Sakurajima volcano measured by precise leveling survey (during Nov. 2018 - Nov. 2019)

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We conducted the precise leveling survey in Sakurajima volcano, southwest Japan in November 2019. The leveling routes measured in this survey are about 21 km long in total, including Sakurajima western flank route and Sakurajima northern flank route. These leveling routes were measured during the period from November 11 to 15. Mean square errors of the conducted survey were achieved with a good accuracy ranging from ±0.22 to ±0.27 mm/km.
From the measured data, we calculated the relative height of each benchmark referring to the reference benchmark BM.S.17 which is located at the western coast of Sakurajima. The calculated relative heights of the benchmarks were then compared with those of the previous survey conducted in November 2018 (Yamamoto et al., 2019), resulting in the relative vertical displacements of the benchmarks during the period from November 2018 to November 2019.
The resultant displacements indicate that no remarkable vertical displacements are detected at the measured benchmarks, although the minor ground subsidence is seen at benchmarks around the central part of Sakurajima. The results suggest that the inflation of the magma reservoir beneath Aira caldera was not remarkable during the period between November 2018 and November 2019. From the preliminary analysis based on a spherical source model (Mogi, 1958), the deflation source is suggested to exist beneath Minamidake crater. However, the pressure decrease is minor during this period.

Keywords: Sakurajima volcano, precise leveling survey, vertical ground deformation

