Changes in carrier phase residuals of GPS satellite radio waves following the eruptions of Sakurajima -Data analysis from 2013 to 2019-

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This study, we investigated temporal changes in the mean and variance of GPS carrier phase residuals before and after volcanic eruptions in Sakurajia. Ohta and Iguchi (2015) found that the eruption of higher than 5000 m on July 21, 2012 in Sakurajima was captured by GPS. They monitor ash plumes using the fact that the carrier phase residuals of signals from GPS satellites is delayed by ash plumes.
Based on this study, large eruptions on Sakurajima from 2013 to 2019 were systematically investigated. We focused only on the eruptions whose height of eruptive column was, greater than 4500 m. GPS data were analyzed using Gipsy-X at three GEONET stations provided by the Geospatial Authority of Japan on the mainland of Sakurajima.
As a result, the carrier phase residuals abnormality could not be clearly seen, but the average of the residuals during one hour after the eruption rose 81% than that during one hour before the eruption. The standard deviation of the residuals also increased by 63% after the eruption.
By adding small-scale eruptions, we will examine environmental factors such as weathered magnetic storms, GPS observation points and satellite paths.

Keywords: volcanic eruption , GNSS, Sakurajima

