

EGU21-13355, updated on 25 Jan 2022
<https://doi.org/10.5194/egusphere-egu21-13355>
EGU General Assembly 2021
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Volcanic deformation at Sakurajima between 2015 and 2020 revealed by Sentinel-1 InSAR time series

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Surface displacements recorded in volcanically active regions are often driven by magmatic, hydrothermal or tectonic processes. Measuring the deformation experienced by the ground as a result of these processes allows to constrain the changing volcanic conditions and to infer quantitative estimates of the subsurface magmatic storage, thus increasing the knowledge of volcanic hazards for the closest local population. Interferometric synthetic aperture radar (InSAR) has proven to be a useful tool to observe ground deformation in volcanically active areas like the Sakurajima volcano, southern Japan, one of the most active volcanoes worldwide. Its current activity is characterized by degassing and almost daily explosive eruptions. We performed an InSAR time series analysis to identify and characterize time-dependent ground deformation using Sentinel-1 data between 2015 and 2020. During this period several large explosions with plume heights of up to 6000 m occurred. We found evidence of ground deformation associated with precursory inflation connected to major explosions. In addition, we processed interferograms spanning a remarkable event that occurred on August 15 2015, in which we identified strong deformation around the Showa crater, in agreement with previous studies.