Crater Activity of Shinmoe-dake(a part of the Mount Kirishima cluster of Volcanoes) from Dec 6 2016 to Oct 25 2017 by InSAR Detection

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Synthetic Aperture Radar SAR is a sensor that irradiates radio waves (microwaves) and receives radio waves reflected from the ground surface and returned. SAR has high resolution performance and can be observed irrespective of weather, it is used for detecting crustal deformation accompanying volcanic activity. This research will detect the deformation of the volcanic mountain by using the interferometric SAR technique. INSAR uses two types of data with different times and finds variates from the differential distance between from the satellite to the target (phase difference). This research will detect the deformation of the Shinmoe-dake by using the interferometric SAR technique.

Processing data from December 6, 2016 to October 25, 2017, including the eruption of Shinmoe-dake, and applying atmospheric correction, it confirmed that subsidence of 2.8 cm on average found in the volcanic crater in 10 months. Validation of the results has been conducted using the GPS data acquired at three points by GSI and measured the RSSE of 1.94cm. Since the accuracy of INSAR and GPS is 1.94 cm, it is conceivable that mean sedimentation of 2.8 cm of volcanic crater is meaningful.However, since the DEM data used in this study is GIS-50m, the data may be old and the result may be unfavorable, so it is considered that it is necessary to obtain the change amount again with the new DEM data.

