

Estimation of crustal deformation at Azumayama volcano during Aug. 2014 –Oct. 2019 by using InSAR in comparison with GNSS

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Azumayama volcano is one of the active volcanoes in Fukushima prefecture. Azumayama had been issued the volcanic alert level 2 during winter 2014 - fall 2016 and fall 2018 - spring 2019. It is the most active volcano in the Fukushima Pref. We have been working on to clarify time-series of crustal deformation at Azumayama volcano [1].

In this study, InSAR (Interferometric Synthetic Aperture Radar) analysis was conducted using the data of Advanced Land Observing Satellite 2 (ALOS2) / Phased Array type L-band Synthetic Aperture Radar 2 (PALSAR2). The crustal deformation was estimated around Azumayama volcano based on the 12 analysis pairs of InSAR. The numerical weather model MSM (Meso Scale Model) [2] was used to correct atmospheric delay. Then new InSAR results and GNSS [3] data were compared for consistent understanding of crustal deformation in the time series.

As the results, atmospheric delays in InSAR were mitigated for most analysis pairs by introducing numerical weather model (MSM). On the other hand, MSM atmospheric correction often did not work well for the InSAR pairs where the weather condition of either of the 2 observation dates was changing rapidly, such as the approach of a cold front or a typhoon. Temporary uplift and subsidence were observed in the north of the Oana crater and a sharp uplift was observed in the west of the crater the period from fall 2018 to spring 2019. The center of crustal movement was considered to have moved to the west of Oana crater from 2014 to 2019.

[1] Abe, K, et al., 2019, JpGU, “Mitigation of atmospheric delay in InSAR for fair estimate of crustal deformation at Azumayama volcano”

[2] MSM, <https://www.jma.go.jp/jma/kishou/known/whitep/1-3-6.html>

[3] Miura, Tohoku University, The report of 131th the Coordinating Committee for Prediction of Volcanic Eruption

Keywords: Azumayama, volcano, crustal deformation, synthetic aperture radar, numerical weather model, InSAR