

Recent crustal deformations around Mt. Azuma revealed by InSAR time-series analysis

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Mt. Azuma is a complex volcano on the border of Fukushima/Yamagata pref., located approximately 200 km north of Tokyo. Increased volcanic tremors/earthquakes were observed in 2014 around Mt. Azuma that associate inflations around Mt. Issaikyo, one of the peak within the complex. Correspondingly, enhanced geothermal activities were observed around the O-ana crater between 2013 and 2015. These activities had ceased in 2016, but then in 2018, increased volcanic tremors/earthquakes were observed again.

In this paper, we identify the crustal deformations associated with these volcanic activities using InSAR time series analysis, determine source locations and change in intensities, and discuss the relation between the time evolution of the sources and observed volcanic activities.

For that purpose, we first analyzed ALOS-2 data (from 2015 to 2018; 8 data) with time series analysis. From the analysis, we identified a pattern of wide crustal deformations over Mt. Azuma. The pattern remains same through time but changes its sign. Deformations corresponding to inflation were observed in 2014-2015, then those corresponding to deflation were observed in 2015-2017, and again those corresponding to inflation were observed in 2018. All these deformations seem to be associated with the spherical pressure source located 3km below sea level (GSI, 2015).

Then we analyzed Sentinel-1 data (from 2018.3 to 2018.11, 21 data) with time series analysis. From the analysis, we identified deformations corresponding to inflation that are localized around the O-ana crater. The deformation rate remains same till September but increased after October.

In this research we re-estimate the source locations/intensities associated with wide/localized deformations, and discuss the relations between time-evolution of those sources and observed volcanic activities.

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