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Crustal deformation around Azumayama Volcano

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Azumaya Volcano is an active volcano located in northeastern Japan and have erupted at and around the Oana crater within recorded history, and currently a large fumarolic area extends across its southern and eastern flanks (Japan Meteorological Agency, 2013). Recent seismicity between 2001 and 2009 are characterized as repeating active and quiet periods with intervals of around 2 to 3 years, while it shows steady activity after 2010 (Japan Meteorological Agency, 2014a). Seismic activity looks slightly declined after 2013, however, it gradually increased since October 2014. A volcanic tremor with a duration of about 35 minutes occurred on December 12, 2014, and the monthly number of volcanic earthquakes in December 2014 counted 576, which is the largest since November 1998 (Japan Meteorological Agency, 2014b).

Japan Meteorological Agency (JMA) deploys 6 continuous GPS sites around the volcano. The data are processed using the precise point positioning strategy (Zumberge et al., 1997) of GIPSY-OASIS II ver. 6.2 with IGS08 precise ephemerides and GMF mapping functions (GMF, Boehm et al., 2006). Since the wide area of northeastern Japan still suffers the long lasting postseismic deformation following the 2011 Tohoku-oki earthquake (M9.0), we try to extract volcanic deformation related to the unrest of the volcano by fitting an approximation function of time consisting of linear, logarithmic, annual, and semi-annual terms. The coefficients of each term are estimated by the least-squares method for the period between April, 2011 and September, 2014.

Resulting displacements around the volcano for the period between October to December, 2014 show radial expansion and slight uplifting, which can be roughly modeled with an point pressure source at a depth of 3.4 km just beneath the summit of Issaikyozan.

Acknowledgement

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Reference

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