

Detection of the crustal deformation at Tokachidake volcano by Interferometric SAR

Youhei Kinoshita[1]; Masato Furuya[2]

[1] Natural history sciences, Hokkaido Univ.; [2] Hokkaido Univ.

Interferometric Synthetic Aperture Radar (InSAR) allows us to detect high precision crustal deformation signals without deploying ground-based measurement tools around volcanic vents. This is because InSAR is a satellite-based active microwave remote sensing technique.

The purpose of this study is to detect the crustal movement around Tokachidake volcano in Hokkaido using InSAR during the period from September 2006 to November 2008. Tokachidake volcano is one of the volcanos of Taisetuzan cordillera in Hokkaido, and recent eruptions took place in 1988 and 2004. In this study, we used the L-band ALOS/PALSAR data in both ascending (nearly northward) and descending (nearly southward) track data.

While long spatial baseline and/or snow cover in winter kept from achieving good coherence in quite a bit of the whole data, we could detect a clear deformation signal in the vicinity of the crater, that indicates a shortening in the radar line-of-sight range and thus presumably represent a localized expansion. We estimated the depth and the volume change using a Mogi model (1958). Our preliminary estimates of the depth and volume change are 1000 m and $3 \times 10^7 \text{ m}^3$, respectively.