

HGM005-07

Room: Exhibition hall 7 subroom 3

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## 2.5-D analysis on landslide deformation in Shimekake, Yamagata Pref., Japan using SAR interferograms

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Since February 2009 landslide occurred and gave damages on houses and farmlands in Shimekake area, west of Mt.Gassan. This area is on gentle slope (ca.250m in elevation) in old and extensive landslide, surrounded by main ridge of 500-550m in elevation; lower part is andesitic-basaltic pyroclastic rocks in geology and upper part is pumice tuff, tuffaceous sandstone and siltstone. This sliding area coincides with reactivated smaller landslide (we call it "landslide A", hereinafter) that occurred in the old landslides. Precursory surface deformation was reported in east of the landslide A, using SAR (synthetic aperture radar) interferograms derived from ALOS/PALSAR (we call the deformed area "landslide B"). In this study we calculated east-west and up-down components of landslide B deformation from two pairs of SAR interferograms using 2.5-D analysis (Fujiwara et al., 2000). One was mapped using PALSAR data observed on 6 June 2006 and 27 October 2008 from ascending orbit (Bperp=452.2m). Another was mapped using the data observed on 12 September 2006 and 17 September 2008 from descending orbit (Bperp=103.8m). As a result, it was found that landslide B moved westward as a whole. Furthermore, calculated downward deformed area coincided with scars and lower part of slope and subtle upward deformed area appeared on lower slope next to the downward deformed area. By comparison, almost all of the upward-deformed area extended to the landslide A; however, because phase does not uniformly change in landslide A in the ascending SAR interferogram, we think that unwrapping error brought such the misestimated upward deformation in landslide A. In this study we used ALOS/PALSAR data provided by JAXA, Japan Aerospace Exploration Agency.

### Reference

Fujiwara et al., 2000, 2.5-D surface deformation of M6.1 earthquake near Mt.Iwate detected by SAR interferometry. *Geophys.Res.Lett.*, 27, 2049-2052.

Keywords: landslide, ALOS, SAR, 2.5-D analysis