Japan Geoscience Union Meeting 2014
(28 April - 02 May 2014 at Pacifico YOKOHAMA, Kanagawa, Japan)
©2014. Japan Geoscience Union. All Rights Reserved.

HDS29-05 Room:415 Time:April 28 12:00-12:15

Detection of pre movements of landslide or deep collapse using InSAR and LiDAR

KOARAI, Mamoru[1*] ; NAKANO, Takayuki[1] ; TODA, Kenichiro[2] ; DAIMARU, Hiromu[3]

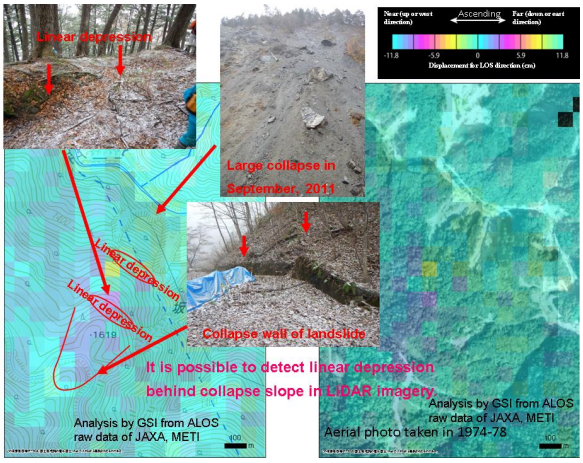
[1]GSI of Japan, [2]Nagano Prefecture Forestry Reserch Center, [3]Forestry and Forest Products Research Institute

It is possible to detect pre movements of landslide or deep collapse using SAR interferometry technology. As previous studies, there are example of the Shimegake Landslide on the foot of Mt. Gassan, Yamagata Prefecture and the Ohkamizawa Landslide in Higashi-naruse Village, Akita Prefecture. In this research, the usefulness of the monitoring methodology which combined SAR interferometry and LiDAR data will be verified for the monitoring of region where the deep collapse will occurred. This research is supported by the Grants-in-Aid for Scientific Research (No.22500994). The main verification fields are Nagano Prefecture and Shizuoka Prefecture. The used InSAR imageries are analyzed by Geodetic Department, the Geospatial Information Authority of Japan, using the data of PALSAR which is L band SAR of the earth observation satellite ”Daichi” (ALOS).

Near the Kuchisakamoto Landslide of Shizuoka Prefecture, a change significant by InSAR imagery in the autumn of 2008 and the autumn of 2009 had occurred, and about 6-7 cm deformation to the LOS direction was observed in one month and a half of 2009. In field survey, the authors checked that the large landslide had occurred between November, 2012 and June, 2013 (Nakano et al., 2013; Koarai et al., 2013).

In west side of Sakamaki hot spring of Nagano Prefecture, about 6-7 cm deformation to the LOS direction was observed in InSAR imagery of one year from 2008 to 2009, and large collapse occurred in September, 2011. In LiDAR data imagery taken before the collapse occurred, it is possible to detect linear depression behind collapse slope.

In this presentation, the authors report many case of pre movement of landslide detected by field survey or LiDAR data in the areas where InSAR imageries show small deformation in Nagano Prefecture.

Fig.1 InSAR imagery of west side of Sakamaki hot spring (2008/07/20-2009/09/07) and sloop deformation detected in field survey

Keywords: deep collapse, landslide, InSAR, LiDAR, Nagano Prefecture