The types of landslide are various, and it is important to monitor the spatio-temporal landslide movement for understanding the landslide mechanism. GNSS survey and ground-based observations are generally used for landslide monitoring, but it is impossible to monitor the spatial distribution of landslide. InSAR (SAR Interferometry) is developed originally for a technique to detect the ground surface displacement spatially. Now InSAR becomes a monitoring tool for the deformation with glacier, landslide and subsidence.

In this study, we estimated landslide displacement from InSAR analysis and studied the characteristic of landslide movement with ground-based observation in the Noto Peninsula, central Japan. We analyzed SAR (synthetic aperture radar) images acquired by ALOS-2/PALSAR-2, and used GNSS and borehole extensometers as the ground-based observation.

InSAR analysis reveals landslide displacement in the area of 300 m x 500 m. The magnitude and direction of landslide displacement is coincident with the ground-based monitoring results. In this study, we present a relationship between the landslide displacement detected by InSAR, the ground monitoring and cumulative rainfall, and discuss the spatio-temporal landslide movement.

Acknowledgement: PALSAR-2 data are shared among PIXEL (PALSAR Interferometry Consortium to Study our Evolving Land surface), and provided from JAXA (Japan Aerospace Exploration Agency) under a cooperative research contract with ERI (Earthquake Research Institute, University of Tokyo). The ownership of PALSAR data belongs to METI (Ministry of Economy, Trade and Industry) and JAXA. We used RINC (coded by Dr. Taku Ozawa), DEM (GSI of Japan), GMT [Wessel, P. and W.H.F. Smith, 1998], and QGIS.

Keywords: Landslide displacement, ALOS-2, InSAR, GNSS, Noto Peninsula