

## Detection of the surficial displacements triggered by the 2007 Noto Peninsula Earthquake by the use of InSAR and GIS techniques

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The results of InSAR analysis (Fukushima et al., 2007) have suggested possible ground surface movements such as landslides in mountain areas in Ishikawa Prefecture, triggered by the Noto Peninsula Earthquake of March 25, 2007 (Mw 6.7). On the processes of field survey in this area, it becomes clear that the locations which have local displacements in the InSAR results are consistent with the positions of the ground surface displacements such as subsidence and liquefactions of the ground, landslides, and slope failures. These ground surface movements are categorized as the non-crustal movement. They are originally triggered by the seismic ground motions under the local conditions of soils, groundwater, and geological and geomorphological features.

GIS techniques are applied to specify the relationship between the ground surface displacement analyzed by InSAR and on-site ground characteristics. The relationships are examined basically by the field survey with the use of overlaid layers of topographic map, geological map, the landslide map database (NIED, [http://lswel1.ess.bosai.go.jp/jisuberi/jisuberi\\_mini/index.asp](http://lswel1.ess.bosai.go.jp/jisuberi/jisuberi_mini/index.asp)), aerial photographs, and the results of geomorphological analysis with 10m DEM (slope and Topographic Wetness Index (Beven and Kirkby, 1979)).

### Results:

- (1) InSAR detected the positions of non-crustal ground surface movements in detail.
- (2) The suggested ground surface movements as a landslide are slips of small slope blocks consistent with the displacements of the InSAR observed from two different directions.
- (3) Near the area of Touge and Monzen in Wajima City, the positions of relative large displacement values of InSAR data are consistent with the confluent area of substreams to the alluvial plains and the portions of old channel and back-lands of River Hakka.
- (4) These positions can be detected by the values of TWI or upstream area analyzed by 10mDEM and hydrogeomorphological interpretation.
- (5) The contour lines of displacement of InSAR in the distant area from epicenter show good agreements with the distribution of river system, especially with the distributions of alluvial plains. These displacements are originated by the non-crustal movements.
- (6) The movements triggered by the strong motion around landslides occurred in the past showed various behaviors. The detail will be shown in the presentation.