

Estimation of co-seismic surface displacement and ground deformation associated with the April 2016 Kumamoto Earthquake, based on differential InSAR by Sentinel-1 and differential LiDAR DEM analysis.

*Sakae Mukoyama¹, Kenichi Honda¹, Norichika Asada¹, Takumi Sato¹

1.KOKUSAI KOGYO CO., LTD.

The 2016 Kumamoto earthquake occurred on April 14 and 15, 2016, along the Futagwa fault and Hinagu fault, in central Kyusyu Island, Japan. We try to reveal location of co-seismic displacement based on InSAR analysis using Sentinel-1 data and high-resolution differential LiDAR DEM.

We used 1 m mesh DEM (Digital Elevation Model) data measured in 2009 (pre-event), 2014 (5 days later from the event), 2015 (about 1 year later from the event), and applied the particle image velocity method to obtain 3-D vectors of coseismic deformation (Mukoyama, 2011). The precision of this method is 0.1 m.

Results show a wide area distribution of ground deformation clearly. Additionally, the result of differential coherence analysis shows distribution of damaged houses and constructions.

Keywords: the 2016 Kumamoto Earthquake, InSAR, Differential DEM Analysis, LiDAR, Image matching analysis