

DInSAR Analysis on regional distribution pattern of surface displacement caused by the 2016 Kumamoto Earthquake

*TAKUMI ONUMA¹

1.JGI, Inc.

Regional distribution pattern of surface displacement caused by 2016 Kumamoto Earthquake has been delineated by DInSAR analysis of co-seismic Sentinel-1 C-SAR pairs. Sentinel-1 carries C-band SAR sensor of which wavelength is 5.6cm, and covers the area of 250km x 250km by 1 scene of the Interferometric Wide Swath mode with the ground range resolution of 5m and the azimuth resolution of 20m. Recurrent period of the Sentinel-1 is 12 days and the region around Japan has been observed at least once every 2 periods. Twelve days interval data are sometimes available for emergency observation cases such as huge disaster of 2016 Kumamoto earthquake. Thanks to these features the Sentinel-1 is said to be one of the most suitable satellite in broad region monitoring.

Two co-seismic pairs of the Sentinel-1 C-SAR data, acquired on 2016/4/8 and 2016/4/20 on the ascending orbit and of 2016/3/27 and 2016/4/20 on the descending orbit, are used in the study. The results of DInSAR analysis of each pair as well as 2.5-dimensional analysis combining these pairs are introduced. Adding to the Sentinel-1 C-SAR data processing, Multi Aperture Interferometry processing which treats the azimuthal offsets along the flight direction of the satellite was performed using co-seismic pair of ALOS-2 PALSAR-2 data covering the main part of the Futagawa Fault and the Mt. Aso caldera.

Keywords: Satellite SAR Differential Interferometry (DInSAR), Sentinel-1 C-SAR data, regional distribution pattern of surface displacement