

ALOS-2/ALOS interferometric analysis and damage identification for the 2015 Nepal Earthquake

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The Japan Aerospace Exploration Agency (JAXA) has been performing observations of the 2015 Nepal earthquake struck on April 25, 2015 (local time) with the Phased Array type L-band Synthetic Aperture Radar-2 (PALSAR-2) aboard the Advanced Land Observing Satellite-2 (ALOS-2, "DAICHI-2") in response to the emergency observation request from Sentinel Asia, the International Charter, etc. We have been analyzing the obtained PALSAR-2 data to identify damaged areas and to detect crustal deformation. The widespread crustal deformation patterns associated with the main shock in April 25th and the aftershock in May 12th were observed by the ScanSAR interferometry which has been made available in ALOS-2 (350 km swath width, 25 m resolution). Around Kathmandu, several local displacements were observed by the normal Stripmap interferometry (70 km swath width, 10 m resolution). We also conducted the interpretation of high-resolution optical images to detect damaged areas. Fallen materials to the river in mountainous regions were searched by comparing the free-access satellite data acquired after the quake and the archived ALOS images, and large fallings caused by landslide and/or avalanche were recognized in several places in the northern Pokhara. The results of our analysis were provided to the disaster response organizations such as ICIMOD and were published on the EORC website.

Keywords: Nepal earthquake, Remote sensing, Synthetic Aperture Radar, Disaster monitoring, Crustal deformation