ALOS-2 contributions for detection of crustal deformation associated with earthquakes

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Analysis of SAR images is a powerful and unique remote sensing technique for detecting coseismic crustal deformation of earthquakes with spatially high resolution and without any ground based observation infrastructures.
Advanced Land Observing Satellite 2 (ALOS-2) is an L-band synthetic aperture radar (SAR) satellite, launched by Japan Aerospace Exploration Agency (JAXA) on 24 May, 2014. Observation capability of ALOS-2 is higher than that of ALOS, the predecessor of ALOS-2 and operated from 2006 to 2011, in terms of a revisit cycle (ALOS-2: 14 days, ALOS: 46 days) and attainable spatial resolution (ALOS-2: 3 m, ALOS: 10 m). Moreover, ALOS-2 can observe not only by common right-looking but also by left-looking, and ScanSAR interferometry is always applicable, unlike ALOS. These improvements enhances rapid-response after earthquake and detection capability of crustal deformation.
SAR Analysis Working Group of the Coordinating Committee for Earthquake Prediction is a group of experts which was established under the Coordinating Committee for Earthquake Prediction, Japan, in order to detect detailed coseismic crustal deformation through analyses of SAR images of ALOS-2, develop related techniques, solve seismogenic mechanism from the deformation field and seek ways to utilize SAR data for disaster response and mitigation. The Geospatial Information Authority of Japan (GSI) is serving as the Secretariat of the working group and summarizing activities of the WG to a report which consists of results of ALOS-2 analysis, contributions for monitoring earthquakes and research regarding three years of ALOS-2 operation.
In this paper, we will show ALOS-2 contributions based on SAR interferograms of significant earthquakes which were observed by ALOS-2 upon urgent requests from the WG and analyzed by GSI. Especially in 2016, detailed crustal deformations were detected along with several inland earthquakes including the 2016 Kumamoto earthquake and the earthquake of the Central Tottori (Mj6.6). We will show SAR ingerferograms and crustal deformation fields of these earthquakes.

Keywords: ALOS-2, SAR, Earthquake, Crustal deformation

