Geophysical Research Abstracts
Vol. 12, EGU2010-12099-1, 2010
EGU General Assembly 2010

A detailed post-seismic surface deformation analysis of the April 2009 L'Aquila (Italy) earthquake through COSMO-SkyMed SBAS-InSAR time series

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Abstract
We investigate the post-seismic surface deformation occurred in the L'Aquila (Italy) area after the 6 April 2009 earthquake, that stroke Central Italy, partially destroying L'Aquila town, several surrounding villages, and causing hundreds of casualties. To this aim we exploit the Differential SAR Interferometry (InSAR) algorithm referred to as Small BAseline Subset (SBAS) technique (Berardino et al., 2002) to analyze the temporal evolution of the detected displacements by means of deformation time series retrieved through data acquired by the COSMO-SkyMed satellites of the Italian Space Agency (ASI). In particular, the exploited COSMO-SkyMed data (high image mode, 35.9° look-angle, swath 05, polarization HH) have been acquired on both right ascending and descending orbits. The ascending data set is composed by 33 images (4 April – 13 October 2009), including one pre-event acquisition, while the descending one by 26 post-event images (8 April – 9 October 2009).
We present a detailed analysis of the post-seismic signal by benefiting of the short revisit time of the COSMO-SkyMed constellation (8 days except for the tandem option) and of the high spatial resolution and density of the exploited measurements.
The presented results demonstrate the dramatic impact of new generation SAR sensors to investigate the deformation field in active seismic areas.

References
Berardino, P., Fornaro, G., Lanari, R., Sansosti, E., "A new Algorithm for Surface Deformation Monitoring based on Small Baseline Differential SAR Interferograms", IEEE Trans.Geosci. Remote Sens., Vol. 40, No 11, pp. 2375-2383, 2002.