Geophysical Research Abstracts
Vol. 19, EGU2017-17390, 2017
EGU General Assembly 2017

Interferometric investigations with the S1 constellation: an application to the Vesuvius/Campi Flegrei volcanic test site

Sven Borgstrom (1), Carlo Del Gaudio (1), Prospero De Martino (1), Valeria Siniscalchi (1), Pau Prats-Iraola (2), Matteo Nannini (2), Nestor Yague-Martinez (2), Muriel Pinheiro (2), Jun-Su Kim (2), Francesco Vecchioli (3), Federico Minati (3), Mario Costantini (3), Michael Foumelis (4), and Yves-Louis Desnos (5)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Napoli "Osservatorio Vesuviano", Napoli, Italy, (2) German Aerospace Center (DLR), Microwaves and Radar Institute, Wessling, Germany, (3) e-GEOS SpA, ASI/Telespazio, Roma, Italy, (4) RSAC c/o ESA-ESRIN, EO Science, Applications and Future Technologies Department, Frascati (RM), Italy, (5) ESA-ESRIN, EO Science, Applications and Future Technologies Department, Frascati (RM), Italy

The contribution focuses on the current status of the ESA study entitled “INSARAP Sentinel-1 Constellation Study” and investigates the interferometric performance of the S1A/S1B units.
In particular, we refer to the Vesuvius/Campi Flegrei (Southern Italy) volcanic test site, where the continuous inflation (about 35 cm from 2011 to date) and the huge availability of ground-based geodetic data (continuous GPS - cGPS - leveling, tiltmetric, gravimetric, etc.) from the INGV-Osservatorio Vesuviano monitoring networks have allowed to get a clear deformation signal, besides the comparison between S1A/S1B and geodetic data. In this regard, the integration between InSAR and geodetic measurements is crucial for a continuous and extended monitoring of such an active volcanic area, as InSAR investigations allow to get an information on wide areas, whereas permanent networks (e.g., cGPS), allow to provide a continuous information complementing InSAR, which is limited by its revisiting time.
Comparisons between S1 constellation data and geodetic measurements, with a particular focus on cGPS, will be presented, exploiting both LOS and inverted (E-W and vertical inversion) InSAR data starting from October, 2014.
In addition, as a next step we are planning to model the deformation source of the area by exploiting the S1 time series results.
Ultimately, very encouraging results suggest for a continuation of this activity also for the future, showing the great potential of S1 constellation data for monitoring active volcanic areas and, in general, to retrieve a very high quality deformation signal.