



Investigations with the Sentinel-1 Interferometric Wide Swath mode: first results and comparison with in-situ geodetic data

Sven Borgstrom (1), Carlo Del Gaudio (1), Prospero De Martino (1), Giovanni P. Ricciardi (1), Ciro Ricco (1), Valeria Siniscalchi (1), Pau Prats-Iraola (2), Matteo Nannini (2), Mario Costantini (3), Federico Minati (3), and Thomas Walter (4)

(1) Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Napoli "Osservatorio Vesuviano" - 80124 Napoli, Italy, (2) German Aerospace Center, Microwaves and Radar Institute - 82234 Weßling, Germany, (3) e-GEOS SpA, ASI/Telespazio - 00156 Rome, Italy, (4) German Research Centre for Geosciences, Section 2.1 - 14473 Potsdam, Germany

The contribution focuses on the current status of the ESA study entitled "INSARAP: Sentinel-1 InSAR Performance study with TOPS Data". The study investigates the performance of the interferometric wide swath (IW) mode of Sentinel-1, which is implemented using the terrain observation by progressive scans (TOPS) mode. In this regard, first analyses with Sentinel-1 time series will be shown, with a comparison with in-situ geodetic measurements on different test sites identified in the framework of the study, namely, Campi Flegrei/Vesuvius area in Italy, Istanbul city in Turkey, and Mexico City. The evaluation of the results will be performed by exploiting mainly continuous GPS stations located on the different sites, besides leveling measurements when also available. Also in a recent past, the comparison between InSAR and continuous GPS data, the latter projected into the radar LOS, has proven to be very effective for a cross comparison, besides InSAR Cal/Val activities, as it was for instance in the case of the recent inflation events occurred in Campi Flegrei area, marked by the well known bradyseismic phenomenon.

Although continuous GPS networks are characterized by a poor space coverage in comparison with InSAR results, continuous GPS data recording allows to complement the geodetic information from InSAR sensors, limited by their revisiting time.

The issue to be faced in this study is the possibility to deal with very low deformation rates in comparison with the Sentinel-1 C-band data, although the Sentinel-1 time series we expect to get from October 2014 to date should allow the identification of ground deformation in the areas of interest.