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Sentinel-1 data exploitation for geohazard activity map generation

Anna Barra (1), Lorenzo Solari (2), Marta Béjar-Pizarro (3), Oriol Monserrat (1), Gerardo Herrera (3), Silvia Bianchini (2), Michele Crosetto (1), Rosa María Mateos (4), Roberto Sarro (3), and Sandro Moretti (2)

(1) Centre Tecnològic de Telecomunicacions de Catalunya (CTTC/CERCA), Geomatics Division, Castelldefels, Spain (anna.barra@cttc.es)), (2) University of Firenze, Earth Sciences Department, Firenze, Italy, (3) Geological Survey of Spain (IGME), Geoscience Research Department, Madrid, Spain, (4) Geological Survey of Spain (IGME), Granada, Spain

This work is focused on geohazard mapping and monitoring by exploiting Sentinel-1 (A and B) data and the DInSAR (Differential interferometric SAR (Synthetic Aperture Radar)) techniques. Sometimes the interpretation of the DInSAR derived product (like the velocity map) can be complex, mostly for a final user who do not usually works with radar. The aim of this work is to generate, in a rapid way, a clear product to be easily exploited by the authorities in the geohazard management: intervention planning and prevention activities. Specifically, the presented methodology has been developed in the framework of the European project SAFETY, which is aimed at providing Civil Protection Authorities (CPA) with the capability of periodically evaluating and assessing the potential impact of geohazards (volcanic activity, earthquakes, landslides and subsidence) on urban areas. The methodology has three phases, the interferograms generation, the activity map generation, in terms of velocity and accumulated deformation (with time-series), and the Active Deformation Area (ADA) map generation. The last one is the final product, derived from the original activity map by analyzing the data in a Geographic Information System (GIS) environment, which isolate only the true deformation areas over the noise. This product can be more easily read by the authorities than the original activity map, i.e. can be better exploited to integrate other information and analysis. This product also permit an easy monitoring of the active areas.