



Use of multitemporal InSAR data to develop geohazard scenarios for Bandung, Western Java, Indonesia

Stefano Salvi (1), Cristiano Tolomei (1), Javier Duro (2), Giuseppe Pezzo (1), and Fifamè Koudogbo (2)

(1) Istituto Nazionale di Geofisica e Vulcanologia, National Earthquake Center, Rome, Italy (stefano.salvi@ingv.it), (2) ALTAMIRA INFORMATION, Barcelona, Spain

The Greater Bandung metropolitan area is the second largest urban area in Indonesia, with a population of 8.6 million. It is subject to a variety of geohazards: volcanic hazards from seven active volcanoes within a radius of 50 km; high flood hazards, seismic hazard due to crustal active faults, the best known being the 30-km long Lembang fault, 10 km North of the city centre; subsidence hazards due to strong aquifer depletion; landslide hazard in the surrounding high country.

In the framework of the FP7 RASOR project, multitemporal satellite SAR data have been processed over Bandung, Western Java. We used the SBAS InSAR technique (Berardino et al., 2002) to process two ALOS-1 datasets, to investigate the various sources of surface deformation acting in the area in the period 2008-2011.

Persistent Scatterer Interferometry (PSI) has also been applied to achieve ground motion measurements with millimetric precision and high accuracy. The PSI processing technique considers a system of points that reflect the radar signal from the satellite continuously through the time. It makes use of differential interferometric phase measurements to generate long term terrain deformation and digital surface model maps. The GlobalSARTM algorithms developed by Altamira Information are applied to COSMO-SkyMed data acquired to measure ground motion over the area of interest.

Strong ground displacements (up to 7 cm/yr) due to groundwater abstraction have been measured in the Bandung basin. The identification of long wavelength signals from tectonic sources is difficult due to the limited InSAR coherence outside of the urban environment. Limited deformation is observed also in the Tangkuban Perahu volcano to the north.

The spatial and temporal distribution of the ground motion is important supporting information for the generation of long term subsidence and flood hazard scenarios.