



Measuring ground motion in the city of Istanbul in Turkey using Persistent Scatterer Interferometry

M. Esmaili (1) and M. Motagh (2,1)

(1) Department of Surveying and Geomatics Engineering, University of Tehran, Tehran, Iran , (2) Helmholtz Centre Potsdam, GFZ German Research Centre for Geosciences, Potsdam, Germany

Differential interferometric synthetic aperture radar (DInSAR) has proven to be an effective and low-cost method for measuring ground surface displacements at cm-level accuracy over large areas. Temporal and baseline decorrelations, and variations in atmospheric conditions are the most critical factors for successful implementation of DInSAR technique. The recently developed Permanent/Persistent Scatterer Interferometry (PSInSAR) technique enables to overcome these drawbacks by doing InSAR analysis in a network of radar-phase stable/coherent points using long time-series of SAR data.

In this paper we process, using the PS approach, all ENVISAT ASAR data acquired from 2003 to 2008 to measure ground deformation in the city of Istanbul in Turkey. Istanbul has a long history of earthquake damage which relates to the right-lateral North Anatolian Fault Zone that passes a few tens of kilometers south of the city. The PS displacement map enables to precisely detect and quantify signals of ground deformation and improve our assessment of the magnitude and the spatio-temporal variations of ground motions in Istanbul resulting from tectonic and non-tectonic sources.