



Present-day tectonics and seismogenetic sources of the Al-Hoceima region (Morocco) constrained using MTINSAR and GPS data

Pablo J. Gonzalez (1), Mimmo Palano (2), and Jose Fernandez (1)

(1) CSIC, Inst. Astronomia y Geodesia, Madrid, Spain (jose_fernandez@mat.ucm.es, 34913944615), (2) Istituto Nazionale di Geofisica e Vulcanologia, sezione di Catania, 95123 Catania, Italy

The 24 February 2004, Mw 6.3 Al-Hoceima earthquake is one of the largest to have occurred in Morocco during the last 100 years. The earthquake caused more than 600 casualties coupled with the collapse of several older buildings. More than 500 aftershocks ($M > 2.3$) were recorded in the two weeks following the main shock. Focal mechanism solutions computed both for main shock and strongest aftershocks indicate oblique strike-slip faults trending either NE-SW with left-lateral slip or NW-SE with right-lateral slip. Here, we processed all GPS data available from the Nubian and Iberian (Eurasian) plate boundary to develop velocity field and strain-rate maps in order to obtain new insight about the present-day tectonics of the investigated area. In addition, we also studied a high non-linear deformation time series using a multitemporal interferometry synthetic aperture radar (SAR) technique, such as those spanning co-seismic signals. That analysis has been challenging due to the problem of intrinsic temporal smoothing of such multibaseline techniques. We used StaMPS/MTI version with the minimum possible temporal smoothing and we retrieved time series of deformation spanning the co-seismic signal due to main shock. Applying a temporal smoothing (atmospheric filtering) to the pre- and post-seismic subsets of the time series we obtained a filtered time series that show a persistent signal during the post-seismic period. Finally we modelled co-seismic and post-seismic ground deformation signals and discussed main results in the light of present-day tectonics of the area.