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# Monitoring postseismic deformation of the Mw=6.4 February 24, 2004 Al Hoceima (Morocco) earthquake using Multi-Temporal InSAR

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The Al Hoceima earthquakes of the May 26, 1994 (Mw=6.0) and February 24, 2004 (Mw=6.4) are the largest seismic events that affected the northern part of Morocco in the last century. The Al Hoceima region is located in the east-west-trending imbricated thrust-and-fold system of the Rif Mountain range that results from the African-Eurasian convergence. The transpressive tectonics and existence of a complex fault network with thrust, normal and strike-slip faulting in the Rif probably reflect the rapidly changing local tectonic regime with block rotations during the Neogene and Quaternary (Meghraoui et al., 1996). The 1994 and 2004 earthquake sequence occurred on conjugate strike-slip faults trending approximately NNE-SSW and NW-SE. The best coseismic model of the 2004 earthquake from InSAR suggests a curved right-lateral strike-slip fault about 21 km-long and 16.5 km-wide, dipping 87-88o eastward with a strike changing from N85oW in the south to N50oW in the north (Cakir et al., 2006). We study the postseismic deformation of the 2004 (Mw=6.4) Al Hoceima earthquake using Multi-Temporal InSAR (MT-InSAR) technique. InSAR time series calculated from 14 ERS-2 SAR images reveals subtle ground movements on the Al Hoceima region between 2004 and 2010 where remarkable coseismic displacement was observed after the earthquake. We used Stanford Method (STaMPS; Hooper, 2008) for analyzing the SAR data that takes the advantage of spatial correlation between pixels and does not use any temporal deformation model in the persistent scatterer identification step. MT-InSAR analysis shows cumulative line-of-sight (LOS) up to 4 cm uplift and subsidence in the region of coseismic surface deformation. Preliminary analysis suggests that the postseismic deformation is likely associated with afterslip.