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Stress field after the 1980 El Asnam and 2003 Zemmouri (Algeria) earthquakes

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This study is focused on the El Asnam (1980, M=7.2) and Zemmouri (2003, M=6.9) earthquakes occurred in northern Algeria. Several slip models are used for computing co and post seismic fields, taking into account the complexity of both ruptures. The resulting displacement fields are compared with those observed by leveling (El Asnam) and GPS (Zemmouri) campaigns. The maximum shear stress indicates a high value in Zemmouri region. Coulomb Failure Function (CFF) and Generalized Angelier Parameter are used for displaying the stress field. The CFF map tries to answer the following question: what magnitude of stress change is needed to significantly modify the seismicity rate? The corresponding threshold is about two bars. The Angelier parameter mapping, used for displaying tectonic regime, is in a good agreement with the INGV and IGN focal solutions computed during the period 1990-2012.

Keywords: Angelier parameter, Coulomb Failure Function, El Asnam, focal mechanisms, stress field, Zemmouri.