Geophysical Research Abstracts
Vol. 14, EGU2012-3334, 2012
EGU General Assembly 2012

Seismotectonics of North Africa

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In this work, the seismotectonic analysis is based on the compiled historical (from AD 42 to 1900) and instrumental seismicity catalogue, a detailed identification of active faults and the study of individual large and moderate earthquakes. The active tectonics of the Tell and Sahara Atlas Mountains are directly related with convergent movements along the Africa - Eurasia plate boundary. Neotectonic structures and significant seismicity (Ms>4.7) document the strain distribution obtained from fault and fold structures and P axes of focal mechanisms of large earthquakes, illustrate the oblique convergence at the plate boundary. A catalogue of fault parameters has been implemented using mainshock and aftershock data, surface faulting and folding structures, InSAR and geophysical results associated with the significant earthquakes since mainly the El Asnam large seismic event (10/10/1980, Mw 7.3). From the long-term deformation along the Africa – Eurasia plate boundary we observe that the shortening rate of the deforming zone that attains 2.2 mm/y is comparable to the compressional rate of 1.5 mm/yr obtained from the seismic moment tensor summation. The pattern of seismic deformation and faulting activity that constrains the seismic zoning in the Atlas Mountains (Sahara and Tell) is the basis for any seismic hazard assessment. This seismotectonic project is conducted with the support of the IGCP-UNESCO programme and Global Earthquake Model for North-Africa.