



Session 39

The case of the Mw6.9 Al Haouz Earthquake - Seismogenic tectonics of an intraplate mountain range - Lessons learned so far

Conveners:

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Topic: seismic hazard and risk, including site effects

Intermediate to large magnitude earthquakes in intracontinental settings are scarce and present large seismic hazard potentials through their large inter-event times. In-depth investigations of the source physics are limited to few events on a global scale, often correlated with low convergence rates along potentially seismogenic faults, which are backed up with larger stress drops and peculiar friction parameters. As a recent example, the devastating Mw 6.9 Al-Haouz earthquake of 08, September 2023 struck multiple provinces in the Moroccan western and central High Atlas, causing 2946 fatalities and 6125 injuries. Primary analyses set the focal depth to ~32 km and identified a low-angle thrust mechanism with minor strike-slip components. So far, this region has traditionally been regarded as having low to moderate seismic activity only. In the absence of an immediate plate boundary, the uplift of the Moroccan High Atlas is primarily attributed to the transmission of far-field stresses resulting from the convergence of the Nubian and Eurasian plates. Structural features therein are mainly inherited from the complex geological history involving different stages of tectonic inversion.

In this session we invite contributions from a diverse field of geoscientific disciplines covering different aspects of this earthquake. This might involve various Earth observation techniques from on-site to purely geodetic data, spanning different scales from epicenter near-field coseismic deformation to teleseismic waveform analyses, single seismic source inversion to aftershock studies, or geodynamic models focusing on kinematics of the whole mountain range, as well as hazard and risk studies.

