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Seismotectonics context of Tunisia: an overview

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In Tunisia, the seismicity appears low to moderate with magnitude, from Mw 2-5.6. Some earthquakes are regularly experienced by the population and locally cause damage and very significant surface effects as indicated by the data of seismic activity since about 1000 years (in IMN Catalog). On the other hand, the historical sources (Roman then Arabic) give evidence of the strong seismic activities. The study of historical manuscripts showed the existence of strong earthquakes that can be devastating, as was the case of the 410 AD Utica earthquake, that of Kairouan in 854 and also the historic earthquake of 856 that devastated the city of Tunis (Catalogue INM).
In Tunisia, the spatial distribution of recent earthquakes epicenters seismically suggests that the main activity occurred in Northwestern Atlas, Southern Atlas, Eastern and Pelagic platform and Tunis surroundings. In addition, we distinguish active zone where late Quaternary surface related deformations (Faults, flexures, uplift) have been evidenced.
This work results from a compilation of seismotectonic features, active faults, historical seismic catalog, recent seismic events and geological information collected in Quaternary deposits. We have chosen to represent several types of historical and recent deformations. Numerous data from multiscalar approachs contributed to this work providing good opportunities to clarify the Present day Kinematic model within the North African margin.
We propose to treat the active deformation based on observations and new investigations in the field to be able to develop new databases for detailed studies of recent tectonics, seismo-tectonic, historical seismicity, ruptures and surface effects in selected risky areas. The regional stress states reconstructed in recent geological outcrops show a correlation with seismic activity. The mechanism of most Tunisia earthquakes combined with the existing tectonic and structural information and reconstruction of the Quaternary stress tensor allow better understanding of the seismogenic zone and provide a better assessment of the seismic risk to infer new conclusions on the seismogenic zones related to the geodynamic African-Eurasia plate boundary.
We aim to concentrate several complementary approaches to determine, in each domain, the seismicity in the most active zones around the major faults and to determine the present stress pattern and of the Quaternary evolution of the paleostress field in Tunisia and to map and to characterize the active fault and to evaluate the seismic risk.