



Active deformation analysis and evaluation of earthquake hazard in Gafsa region (Southern Atlas of Tunisia)

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The Southern Atlas of Tunisia constitutes the transition between Atlas fold and the Northern edge of the Saharan platform. The general direction is near to E-W deflected to N060 whose structural style and geometry of deformation still complex. This domain is Southern part of the seismic zone bordering the Northern African plate as indicated by the large seismic events that occurred periodically. The Gafsa area, more particularly concerned by seismic risk, is bordered to the North by the NW-SE trending “Gafsa Fault” and has significant seismic. The most active tectonic are related to the reactivating of pre-existing NW-SE and E-W trending strike-slip faulting.

We will set up the network in the active zone of Gafsa surroundings, in order to cover the area of aftershocks (co-seismic surface rupture) of May 22, 1972 and December 27, 1985 ($M_s=4.2$) in Gafsa and November 7, 1989 ($M_s=4.4$) in Metlaoui, December 8, 2010 and in Sidi Aich ($M_s=3.66$). Paleostress and calculated focal mechanism solutions for the earthquakes show that the active stress field is a NW-SE trending compression.

Damage and surface effects of land and urban areas caused by these events demonstrate the vulnerability of cities in the region of Gafsa to seismic activities. The analyses of recent and active deformation in this region has allowed the assessment of urban seismic hazard and take stock seismic zones embedded in a distorted geographic information system (GIS) in close relationship with the regional tectonic setting. This assessment has provided crucial information on the neotectonic deformation and seismotectonics of Gafsa region and its surrounding which affects remote orogenic dynamics and the current state of the North African margin. In particular, the comparison between the deformations and quantified seismic activity has also assessed the risk and the regional seismic hazard and develop a seismotectonic zoning.