



Seismotectonic features of the African plate: the possible dislocation of a continent

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The African continent is made of seismically active structures with active deformation in between main substratum shields considered as stable continental interiors. Seismically active regions are primarily located along rift zones, thrust and fold mountain belts, transform faults and volcanic fields. The active tectonic structures generated large and destructive earthquakes in the past with significant damage and economic losses in Africa. Although some regions of the continent show a low-level of seismic activity, several large earthquakes (with $M > 7$) have occurred in the past. The presence of major active faults that generate destructive earthquakes is among the most important geological and geophysical hazards for the continent. National and International scientific projects dealing with the seismic hazards assessment are increasing in seismically active regions in Africa. The UNESCO-SIDA/IGCP (Project 601 <http://eost.u-strasbg.fr/~igcp601/>) support the preparation and implementation of the “Seismotectonic Map of Africa”. Therefore, new seismotectonic data with the regional analysis of earthquake hazards became necessary as a basis for a mitigation of the earthquake damage.

A database in historical and instrumental seismicity, active tectonics, stress tensor distribution, earthquake geology and paleoseismology, active deformation, earthquake geodesy (GPS) and gravity, crustal structure studies, magnetic and structural segmentation, volcanic fields, collision tectonics and rifting processes is prepared to constrain the geodynamic evolution of the continent. Taking into account the geological, tectonic and geophysical characteristics, we define six seismotectonic provinces that characterize the crustal deformation. With the previously identified Somalia tectonic block, the seismotectonic and geophysical framework of the continent reveal the existence of the Cameroon volcanic line, the South African tectonic block with transform faulting and Cape folding system, the Libyan rifting and Maghreb thrusting. Although bearing a relatively slow deformation with regards to the East Africa Rift System, the Nubia plate previously considered as a homogeneous tectonic block appears to be dislocating progressively also forming a system of microplates. A synthesis of earthquake studies and regional deformation exposed in a seismotectonic map hitherto serves as a basis for the seismic hazard evaluations and the reduction of seismic risks.

* IGCP/SIDA: International Geoscience Program/Swedish International Cooperation Authority

<http://www.unesco.org/science/IGCP>

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