



Neotectonic faults and stress field in the East African Rift System around the Tanzanian Craton – A contribution to the seismotectonic map of Africa

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As a contribution to the UNESCO-IUGS IGCP 601 project “Seismotectonics and seismic hazards in Africa” and in preparation of the Seismotectonic Map of Africa, we compiled the neotectonic faults related to the East African Rift System around the Tanzanian craton. The initial aim was to identify and map the potentially active faults. Faults are usually defined as active when they show seismogenic displacement during the last 10,000 to 100,000 years, generally on the basis of paleoseismic investigation. In East Africa, however, very few faults have been studied by paleoseismic techniques and even fewer have known historical seismic activation. To address this issue, we mapped faults that show morphological indications of displacement. We used the SRTM DTM (90 and 30 m when available to us), with artificial shading as basis for identify neotectonic faults, in combination with existing data from geological maps, publications and reports, complemented by our own field observations. Thermal springs often occur along tectonically active faults. We use them to distinguish present-day faulting from other mapped faults as they are in most cases structurally controlled. In parallel, we used also the available focal mechanisms and geological fault-slip data to constrain the stress second-order stress field (at the scale of rift segments) and locally also the third-order stress field (at the local scale).

All these elements are combined and compared with existing kinematic models for the East African Rift based on earthquake slip vectors, GPS measurements and geologic indicators. The comparison evidences some local discrepancies between the stress field and the direction of opening, probably due to the interactions between different rift segments, as in the Rukwa rift, Mbeya southern junction between the eastern and western rift branches, and in the Manyara-Natron area.