



Geodynamic significance of the TRM segment in the East African Rift: active tectonics and paleostress in western Tanzania

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The Tanganyika-Rukwa-Malawi (TRM) rift segment in western Tanzania is a key sector for understanding the opening dynamics of the East African rift system (EARS). In an oblique opening model, it is considered as a dextral transfer fault zone that accommodates the general opening of the EARS in a NW-SE direction. In an orthogonal opening model, it accommodates pure dip-slip normal faulting with extension orthogonal to the rift segments and a general E-W extension for the entire EARS. We investigated the active tectonic architecture and paleostress evolution of the Ufipa plateau and adjacent Rukwa basin and in order to define their geodynamic role in the development of the EARS and highlight their pre-rift brittle tectonic history. The active fault architecture, fault-kinematic analysis and paleostress reconstruction show that the recent to active fault systems that control the rift structure develop in a pure extensional setting with extension direction orthogonal to the trend of the TRM segment. Two pre-rift brittle events are evidenced. An older brittle thrusting is related to the interaction between the Bangweulu block and the Tanzanian craton during the late Pan-African (early Paleozoic). It was followed by a transpressional inversion during the early Mesozoic. This inversion stage caused dextral strike-slip faulting along the fault systems that now control the major rift structures. It has been erroneously interpreted as related to the late Cenozoic EARS which instead is characterized by pure normal faulting.