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Present-day tectonics in the interaction between Victoria and Rovuma microplates with Nubia: an important clue in understanding the tectonic framework of East Africa

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The East African Rift System is commonly explained as a broad zone of continental extension separating two major tectonic plates: Nubia and Somalia. Recent models based on a still limited number of seismic and GPS data show that two minor plates: Victoria and Rovuma occupy the broad zone between the two major plates. The interaction between these different units defines the various branches of the East African Rift.

The triple junction between the major Nubian plate and the two minor Victoria and Rovuma plates is hosting the Rungwe Volcanic Province near Mbeya in Tanzania, which is characterized by well expressed neotectonic tectonic features and several major volcanic eruptions during the last 10.000 years. However, the characteristics of the active deformation at the vicinity of this triple junction, although still imperfectly known, do not seem to agree with the proposed kinematic model:
• In the region of Mbeya, a recent to present-day tectonic of strike-slip type is shown both by field and seismological data although one could expect a radial extension;
• The boundary between the Victoria and Rovuma presents a very weak to non-existent seismic activity but apparently fresh morphotectonic scarps are visible on the satellite images and SRTM-DEM, which could imply a long-term but episodic tectonic activity;
• Within the Nubian plate, supposed to be rigid, three systems of NE-SW tectonic depressions (Upemba and Mwreo in RDC; Luangwa in Zambia) which are seismically active, are controlled by neotectonic faults along some of which a large number of warm hydrothermal springs are located (40 to 90°).

In order to test the existing kinematic models, the Tanzanian GPS network is currently being extended towards RDC and new broadband seismic stations installed. Before these new data will become available, we present a review of the available geological data on active faults and stress inversion results from earthquake focal mechanisms.