



Pull-apart rift tectonics and exhumation history along the East African continental margin of northern Mozambique: new thermochronological data

Joachim Jacobs (1), Benjamin Emmel (1), Rajeev Kumar (1), Kosuke Ueda (1), and Robert J. Thomas (2)

(1) University of Bergen, Department of Earth Science, Bergen, Norway (joachim.jacobs@geo.uib.no), (2) British Geological Survey, Keyworth, Nottingham, UK

Large parts of the East African passive margin resulted from a complex strike-slip reactivation of the ca. 600-500 Ma East African-Antarctic Orogen (EAAO). We have modeled the exhumation history of the wider margin in a critical area in northern Mozambique, where the margin zigzags, following pre-existing structures of the EAAO. In northern Mozambique, the EAAO is represented by two tectonically very different domains. These are separated by the Lurio Belt, a distinct lineament oblique to the length of the orogen. We interpret the Lurio Belt as an accommodation zone within the EAAO, between two thermo-mechanical very different parts of the orogen. It separates an area to the south in which the orogen underwent delamination of its orogenic root and subsequent orogenic collapse, and an area to the north, where the orogenic keel is still present. We present ca. 100 new combined apatite, titanite and zircon fission-track analyses across the Lurio Belt in order to test, whether and to what extent this lineament was reactivated during Gondwana break-up. Generally, we find younger fission-track ages (< break-up) to the south of the Lurio Belt, whilst the basement to the north of the Lurio Belt was exhumed already prior to break-up. We interpret our data to indicate syn-break-up exhumation as a result of stretching of the relatively juvenile and therefore rheologically weak lithospheric mantle in a pull-apart type rift scenario to the south of the Lurio Belt. The maximum differential exhumation to the north and south of the Lurio Belt is estimated to reach 10 km.