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# Thermo-tectonic history reconstruction of the Rwenzori Mountains, D. R. Congo

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The Albertine Rift forms the northern section of the western Rift of the East African Rift System (EARS) which was developed during the Neogene time. The Rwenzori Mtns evolved along the eastern rift shoulder of the Albertine Rift, rising up to form a striking feature within the rift valley. The scarcity of volcanic activity in the Western Rift has raised questions about the Rwenzori Mtns origin and evolution and how this fits into the general evolution of the Albertine Rift and the EARS. The Rwenzori Mtns represent the horst block in the Albertine Rift, with elevations reaching 5109 m a.s.l. (Margherita Peak). The main lithologies of the Rwenzori Mtns are gneiss, schist and amphibolite, subordinate intrusive rocks with various metamorphic overprint, and quartzite of Precambrian age (Tanner, 1971). All these units are intensively truncated by N–S, NW–SE, NE–SW and E–W trending normal faults, locally with a significant strike-slip component (Ring, 2008). The slope Rwenzori Mtns western flank is much steeper than the eastern one. This asymmetry is most striking in the central part where the western flank rises from about 1000 m a.s.l. to more than 5000 m a.s.l. in less than 15 km while, the eastern flank plunges to 1000 m a.s.l. again along a distance of more than 30 km (Bauer et al., 2013).
Detailed thermochronologic study on the eastern (Uganda) side of central Rwenzori differentiated it into northern and southern blocks (Bauer et al., 2013). Samples from the northern block cooled faster, with three cooling/exhumation events; to $\sim$120 °C in Carboniferous to Permian times, to $\sim$70 °C in Mesozoic times, and to surface temperature in the Neogene. While, the southern block shows an earlier onset of cooling/exhumation events (>400 Ma). On the other hand, 33 samples from the western (Congo) side of central Rwenzori were studied using fission track and (U/Th)-He techniques. The apatite fission track data gives much younger cooling ages. Which, distinguished in three cooling age groups with; Eocene, Oligo-Miocene, and Middle Miocene ages. These results reveal the difference in thermo-tectonic history between the eastern and western flanks of Rwenzori Mtns and support the tilt uplift geometry hypotheses (e.g. Pickford et al., 1993).

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