



Thermal and erosional evolution of the Albertine Rift in East Africa, evidence from the western rift shoulder (DRC)

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In East Africa, the feedback between tectonic uplift, erosional denudation and associated possible climate changes is being studied by a multidisciplinary research group, 'Riftlink'. The group's focus is the Albertine Rift of the East African Rift System (EARS), and therein rising Rwenzori Mountains that stretch along the border of the D.R. Congo (DRC) and Uganda. Major questions relate to the timing of the formation of the Rwenzori Mountains and the evolution of the surrounding Albertine Rift: whether the height of the Rwenzoris (>5 km) relates to rift movements in Neogene times, or represents an old basement block that formed a topographic high long before [1,2].

To understand the morphological evolution of an area or landscape, knowledge about phases of (dis-)equilibrium between rock exhumation and rock uplift governed by climatic and tectonic processes is essential. Low-temperature thermochronological techniques, like fission-track and (U-Th-Sm)/He dating on apatite and zircon are well established tools to trace rock displacements through the upper crust. And, therefore, provide fundamental information helping to decipher the long-term landscape evolution of an area.

During two field campaigns in 2009 & 2010 samples for apatite fission-track (AFT) and (U-Th-Sm)/He analyses on apatite and zircon (AHe, ZHe) were taken, providing the first thermochronological data set of this region. Field-work focused on the area between Lake Edward and the Blue Mountains at Lake Albert, covering an entire N–S transect along the Western Rift shoulder and an E–W transect across the western flank of the Rwenzori Mountains.

Thermal modelling of the obtained AFT, AHe and ZHe data allows better constraining the exhumation history of the Rwenzori Mts and provides first data based models of the long-term landscape evolution of the western rift shoulder of the Albertine Rift.

The presentation aims to give an overview on the morphological and geological variations and long-term landscape evolution along the western shoulder of the Albertine Rift based on field observations and thermal modelling.

References

- [1] Bauer, F.U. et al.(2010): The Eastern Congo-a beauty spot, rediscovered from a geological point of view. *Geol Tod*, 26,2
- [2] Bauer F.U. et al. (2010): Thermal and exhumation history of the central Rwenzori Mountains, Western Rift of the East African Rift System, Uganda. *IJES*, DOI: 10.1007/s00531-010-0549-7