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Exhumation rates and long-term landscape evolution, Northwest Namibia

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The aim of this project is the quantification of the cooling, exhumation, rock and surface uplift, and long-term dynamic topography evolution of the South Atlantic passive continental margin (SAPCM) in Namibia. Excellent onshore outcrop conditions and complete rift to post-rift archives Namibia (onshore Walvis ridge) allow a high precision quantification of long-term processes and process-response systems. This climate-continental margin-mantle coupled process-response system is caused by the interaction between endogenic and exogenic forces, which is related to the mantle-process driven rift – drift – "passive" continental margin evolution of the South Atlantic, and the climate change since the Early/Late Cretaceous climate maximum. Special emphasis will be given to the influence of long-living transform faults such as the Omaruru Lineament, the Waterberg Thrust, and the Okahanja Lineament running perpendicular in the continent and the coast parallel Sesfontein and Puros Shearzone in the Kaokoveld on the long-term dynamic topography evolution of the SAPCM's. A combination of apatite and zircon fission-track and (U-Th-Sm)/He thermochronological data with modeling of t-T path′s will determine cooling, exhumation, and rock and uplift rates thru time. Additionally, already published thermochronological data will be integrated.

Sampling strategy considered the recent morphology of the landscape, known fracture and fault zones, and variations in lithologies. Furthermore, sampling at the surface followed the outline of the seismic lines shot by the GFZ Potsdam. Altogether 140 samples were collected in two field campaigns between Angola in the North and Walvis Bay in the South. Special emphasis was given to the Kaokoveld area in the far NW of Namibia. The field work included a description of lithology and quantification of structures of all sample outcrops.