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Rates, causes, and dynamic of long-term landscape evolution of the South Atlantic "passive continental margin", Brazil and Namibia, as revealed by thermo-kinematic numerical modeling.

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The aim of the research is to quantify the long-term landscape evolution of the South Atlantic passive continental margin (SAPCM) in SE-Brazil and NW-Namibia. Excellent onshore outcrop conditions and complete rift to post-rift archives between Sao Paulo and Porto Alegre and in the transition from Namibia to Angola (onshore Walvis ridge) allow a high precision quantification of exhumation, and uplift rates, influencing physical parameters, long-term acting forces, and process-response systems. Research will integrate the published and partly published thermochronological data from Brazil and Namibia, and test lately published new concepts on causes of long-term landscape evolution at rifted margins. The climate-continental margin-mantle coupled process-response system is caused by the interaction between endogenous and exogenous forces, which are 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 Florianopolis Fracture Zone (FFZ) on the long-term topography evolution of the SAPCM's. A long-term landscape evolution model with process rates will be achieved by thermo-kinematic 3-D modeling (software code PECUBE and FastCape). Testing model solutions obtained for a multidimensional parameter space against the real thermochronological and geomorphological data set, the most likely combinations of parameter rates, and values can be constrained. The data and models will allow separating the exogenous and endogenous forces and their process rates.