



Sensitivity analysis of a variability in rock thermal conductivity concerning implications on the thermal evolution of the Brazilian South Atlantic passive continental margin

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The aim of the research is to quantify the long-term evolution of the western South Atlantic passive continental margin (SAPCM) in SE-Brazil. Excellent onshore outcrop conditions and extensive pre-rift to post-rift archives between São Paulo and Laguna allow a high precision quantification of exhumation, and rock uplift rates, influencing physical parameters, long-term acting forces, and process-response systems. The research integrates published (Karl et al., 2013) and partly published thermochronological data from Brazil, and test lately published new concepts on causes of long-term landscape and lithospheric evolution in southern Brazil.

Six distinct lithospheric blocks (Laguna, Florianópolis, Curitiba, Ilha Comprida, Peruipe and Santos), which are separated by fracture zones (Karl et al., 2013) are characterized by individual thermochronological age spectra. Furthermore, the thermal evolution derived by numerical modeling indicates variable post-rift exhumation histories of these blocks. In this context, we will provide information on the causes for the complex exhumation history of the Florianópolis, and adjacent blocks.

Following up on our latest publication (Braun et al., 2016) regarding the effect of variability in rock thermal conductivity on exhumation rate estimates we performed a sensitivity analysis to quantify the effect of a differentiated lithospheric crust on the thermal evolution of the Florianópolis block versus exhumation rates estimated from modelling a lithospheric uniform crustal block.

The long-term landscape evolution models with process rates were computed with the software code PECUBE (Braun, 2003; Braun et al., 2012). Testing model solutions obtained for a multidimensional parameter space against the real thermochronological and geomorphological data set, the most likely combinations of parameters, values, and rates can be constrained.

References

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