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Transient signs in bedrock rivers of the southernmost Brazilian and Uruguayan shields

Marcio Cardoso Junior, Ariane Santos da Silveira, Mateus Rodrigues de Vargas, José Manuel Marques Teixeira de Oliveira, Vinicius Lôndero, Dante Vinicius Eloy Barbosa, Luiz Felipe Bertoldi de Oliveira, Lucas Gabriel Ferreira Alves, and Aline Cambri Fredere
Programa de Pós-graduação em Geologia, Universidade do Vale do Rio dos Sinos - UNISINOS, São Leopoldo, Brazil,
marciocard@unisinos.br

The Earth's surface is a result of tectonic and erosional processes shaping landscapes and preserving transient signs of different evolutionary stages. These transient signs are produced by a gradual adjustment of rivers to an equilibrium stage through channel incision and uplift. The processes effects have different magnitudes according to lithologic contrasts and base level changes that combined influence in disequilibrium phases of bedrock rivers. A integrate study of geomorphic indices in bedrock rivers of the southernmost Brazilian and Uruguayan Shields is developed to identify key signs of transience associated to those surface process and compared between the contrasting drainage basins results. These indices are combined to published thermochronology ages to build a landscape evolution model of these shields. The study area is essentially composed by igneous-metamorphic rocks of Precambrian ages of the Dom Feliciano Belt amalgamated during the Proterozoic-Phanerozoic boundary in the Brasiliano Orogeny. Digital elevation models are used to extract geomorphic indices through interactive MATLAB tools and compared the erosional stages and uplifted regions. This study reveals lineament structures signatures aligned with knickpoints as indicator of the suture zones of distinct terranes in the area. These terranes also feature different erosional stages according to hypsometric results. Thermochronological data support the tectonic framework of three uplift phases starting by the exhumation of western terranes during Devonian ages. A second stage is connected to an uplift preceding the Pangea breakup with the reactivation of Brasiliano Orogeny lineaments. And, the third phase is associated with plate flexural responses of the adjacent oceanic crust during the Cenozoic Era. Finally, the evolutionary model shows strong transient signs in the north region of the studied area indicating a locus of a possible stronger uplift process. In this part of the Dom Feliciano Belt all exhumation phase are evidenced by transient signs of disequilibrium. Differently, the southern region in the Uruguayan Shield shows a more denudated landscape with more mature stages of erosional process.

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