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Do thermochronological data store the Parana-Etendeka plume movement?

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Vertical movements have an important impact in various plate tectonic environments, connecting endogenic and exogenic dynamic forces. Therefore, the timing, rates, and causes of vertical movements are important for quantifying the dynamic of topographic evolution of large surface areas on long time scales. Whereas timing, rates, and causes of vertical movements in orogenic environments are reasonable understood, similar knowledge within the rift to passive margin environment, and within plate interiors is partly lacking.
Recently, Friedrich et al (2017) derived a stratigraphic framework that reveals surface effects of sedimentation and erosion (unconformities and hiatuses) predicted by the ascending mantle plume model of Campbell and Griffiths (1990). Regional-scale erosion dominates above the plume center prior to plume arrival at the base of the lithosphere, followed by extensional collapse and flood-basalt eruption, while a nearly complete sedimentary record can be preserved in distal regions that did not experience plume-related surface uplift. Intermediate sedimentary sections are complex: they undergo surface uplift and erosion followed by subsidence and sedimentation, and renewed outward-directed uplift and erosion as the plume head collapses and spreads laterally.
In this work, published stratigraphic records of South America and South Africa were compared, and viewed in the frame of the rising plume model (Friedrich et al., 2017). Furthermore, an extensive thermochronological data set from Brazil (Krob et al., subm.), Uruguay (Glasmacher et al., in prep.), and Namibia (Menges et al., in prep) were tested against the revealed geological evolution during the rise of the Parana-Etendeka plume.

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