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Tectonic relations between shallow and deep crust in the southeastern Brazilian continental margin: low temperature thermochronology, gravimetry and seismic reflection

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Low-temperature thermochronology studies, gravimetric and seismic reflection modeling, developed on the southeastern Brazil has been approached independently and without apparent connection. This paper correlates data from shallow and deep crust in the region that includes the Serra do Mar and Mantiqueira. This region is formed by Precambrian rocks with steep topography resulted of intense reworking during the Mesozoic and Cenozoic.

Fission tracks data on zircon, apatite and U-Th/He methodology record a polycyclic history with tectonic peaks at temperatures below 240oC in 90, 60 and 45 Ma. Uplift and exhumation alternated heterogeneously along the margin, related to a E-W extensional process with strong vertical movements. Associated with the history of the Eocene, Precambrian rocks, forms structure of the Southeastern Brazilian Continental Rift of totaling approximately 2 000 km along the continental and submerged margin of the southeastern South America

Gravimetric modeling shows an alignment of denser rocks at the base of the crust along the Rift.

Interpretation of reflexion seismic section in the Campos Basin, shows syn-rift, post-rift stratigraphic sequences and Precambrian basement, postulating an tectonic evolution with an crustal stretching (Cainelli, C., Mohriak, W.U.,1998; Macedo, J.M., 1989). This process would be associated with the drift phase (Post-Albian) responsible for the large amount of clastic sediments to the marginal basins and can be observed in the interpretations of seismic profiles and wells.

The correlation of the thermochronological, seismic and gravimetric tools allows us to consider an E-W stretching with thinning of the continental, until the oceanic crust, in SE Brazil, with uplift of the lithospheric mantle and consequent formation of the Serra do Mar and Mantiqueira, erosion and deposition of sediments of the Southeastern Brazilian Continental Rift, all occurring, after the drift phase of the South Atlantic Rifting. Concepts of plume and delamination can be attributed to these modeling.

References

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