



## **Influence of differential denudation and variable necking depth on Cenozoic tectonism in the southeastern Brazilian margin**

Rafael M. Silva and Victor Sacek

Universidade de São Paulo, Instituto de Astronomia, Geofísica e Ciências Atmosféricas, Departamento de Geofísica, Brasil  
(rafael.m.silva@usp.br)

In the southeastern Brazilian divergent continental margin, a pair of escarpments parallel to the coast, the Serra do Mar and the Serra da Mantiqueira, are separated by an elongated valley originated by a renewed Cenozoic tectonism that created a series of grabens and small sedimentary basins, known as the Continental Rift of Southeastern Brazil (CRSB). Originated more than 60 million years after the opening of the South Atlantic ocean, the mechanisms invoked to explain the formation of the CRSB included regional uplift induced by hotspot activity, links with pulses of Andean orogeny, and reactivation of preexisting faults. However, these models are essentially qualitative. To test the various mechanisms in a quantitative way, we used a finite element model to simulate the evolution of the lithospheric stress field and analysed the influences of these mechanisms in the formation of the continental rift. Our results showed that the high differential denudation of the continent and a shallow necking depth of the margin were the primary factors that contributed to the reactivation of the subvertical shear zones in the marginal area, which originated the CRSB in the Cenozoic. Other processes like regional uplift induced by asthenospheric dynamics and far-field stresses were of secondary importance in the continental rift formation.