

KINEMATICS OF THE CRETACEOUS RIFT ALONG THE EASTERN BRAZILIAN MARGIN

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Rifting along the Eastern Brazilian margin between Rio Grande and Charcot fracture zones last for more than fifty million years. Rifting started along the Recôncavo-Camamu-Sergipe-Gabon rift system around 142 Ma.; and propagated southward as the Paraná-Etendenka hot spot evolved ca. 130Ma.

During the long time of rifting, the direction of opening changed three times: initial E-W opening (Berriasian to Barremian) was followed by NW-SE opening (Aptian to Albian), finally changing to NE-SW extension (Albian-Cenomanian) at the northeastern corner of South America. The trend of the Brazilian margin is strongly controlled by basement heterogeneity, which also determined the SW-NE direction of rift propagation. In that way, as the initial opening direction was oblique to the direction of propagation, oblique rifting dominated Santos basin, in contrast with orthogonal rifting in Espírito Santo basin, with a transition between both styles along Campos Basin.

Occasionally, the rift tried to propagate toward northwest, and that resulted in NW-SE trends of fractures and dike swarms, as along Ponta Grossa/Guapiara and Vitória-Colatina swarms. Also, NW-SE shear corridors characterized by en echelon arrangements of rift border faults developed in the Camamu/Recôncavo-Tucano rift system.

The tectonic activity along the Eastern Margin rejuvenated eastward and that maybe explained by the changes in the opening direction, resulting in abandoned areas as the tectonic activity concentrates each time more in the distal offshore margin where final break up took place.

The last region to be rifted from Africa was the Paraíba basin, in northeastern corner of Brazil, where NE-SW extension occurred was probably connected with right-lateral transtensional motion along the Brazilian Equatorial margin. This final propagation through the so called Transversal Zone, between Pernambuco and Patos shear zones in Brazil, was preceded by the acid to intermediate volcanic suite of the Cabo Magmatic Province, an unique Albian (102 Ma) magmatism along the Brazilian margin.