

SOUTH ATLANTIC OPENING: RIFTS IN THE EQUATORIAL ATLANTIC ?

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The opening of the equatorial Atlantic was dynamically controlled by lithospheric stresses, resulting in an unique segment among the Circum-Atlantic basins, which can not be adequately explained by conventional extensional processes, such as passive or active rifting, or by mechanisms such as pure-shear or simple-shear, typical of divergent margins. The fragmentation process began in Late Barremian time, with the initiation of lithospheric stretching in the Equatorial Atlantic, triggered by the onset of transtensional deformation. This event climaxed during the Aptian, when almost instantaneous extension generated relatively wide and shallow precursory basins, with no evidence of volcanic margins or widespread development of typical syn-rift basins, as expected in orthogonal extensional regimes. The term syn-rift is avoided due to major deviations from a classical rift signature. The equatorial splitting evolved during the Albian-Cenomanian interval, through a multi-stage basin development, which is better understood if the kinematic and dynamic controls are considered along with the chronologic activation of transform faults, the emplacement of oceanic crust and the onset of drifting between Africa and South America. The geodynamic evolution on the Equatorial Atlantic is addressed by recognizing tectonic stages that pre-date, are synchronous or post-date the activation of transform faults in the Equatorial Atlantic. These are related to kinematic and dynamic controls provided by the emplacement of fractured swells as proto mid ocean ridges, followed by the creation of oceanic crust and the onset of transform shearing between Africa and Brazil