

Brasilian and Angolan Passive Margins: The Kinematic Constraints

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The thinning of continental passive margins is usually explained by conservative models using stretching and/or simple shear. Nevertheless, those models imply hypothetical extensional structures and large horizontal movements between the two homologous margins (more than 250 km for the Brazilian and Angolan Margins). Therefore, the consequences induced by a pre-break-up kinematic reconstruction are tremendous on the genesis of the continental passives margins that marked the break-up area. Several authors have already addressed the problem of the pre-opening reconstruction in the South Atlantic Ocean, in the past. Nevertheless, the more recent entire reconstructions of the break-up present numerous unexplained misfits (gaps, overlaps and misalignments) that invalidated the fit. We present here a new reconstruction based on new interpretation of magnetic data, satellite altimetry and oceanic and continental geological constraints. The Zaiango refraction/reflection data together with this new closest pre-opening fit show that the Angolan-Campos system presents a 200 km wide thinned basin which is, according to the shallow deposited salt layer, in high position all along its genesis and at least until the breakup. This basin cannot be explained by further horizontal movement: vertical motions prevail compared to horizontal motions in the formation on the huge thinned Angolan-Brazilian basin. Thus, middle and/or inferior crusts have to be involved in processes as: "flowing" in the first accreting process (for the volcanic margin), or denudation processes to create the first "proto-oceanic crust" and/or flowing laterally along different margin segments, or even mixing with the upper mantle underneath.

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