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Palaeogeography of the Central segment during the South Atlantic opening

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The South Atlantic ocean was initiated with a rifting phase during the Cretaceous: the Austral segment until the Walvis-Rio Grande Fracture zone opening during the upper Jurassic and lower Cretaceous, and the Central segment, from the Walvis-Rio Grande ridge to Ascension Fracture zone opening during Aptian. The latter is characterized by the presence of a thick salt layer (Brice et al., 1982; Brognon et Verrier, 1996), distinctive of an arid climate. During the connexion between the North and the South Atlantic during Albian times, a wet climatic belt occurs north of the Central segment (Chumakov et al., 1995). What does the occurring of this belt mean? What is the impact of the South Atlantic opening on climatic changes? What are the consequences on the dynamics of sediment flux?

In order to integrate tectonic and climatic controls in sedimentary record of this section of the South Atlantic, we choose a stratigraphic modelisation approach, with the DIONISOS software. For this, we propose new palaeogeographic maps of the Central Segment, from Valanginian to Albian, according to cinematic model of Moulin et al., (2009). Those reconstructions allow (1) to specify the segmentation of the Central Segment, (2) to define the various depositional environment (marine, lagoon, continental, lacustrine) and so as to differentiate the syn-rift sedimentation from the sag and salt periods, then the one contemporary of the oceanisation, and (3) to discuss about asymmetry of this margin.

During the South Atlantic opening, the Central Segment is mainly segmented by the Walvis-Rio Grande Fracture Zone (FZ), the Benguela FZ, the Luanda Transform Fault, the N'Komi FZ, and the Ascension FZ, which may divide the margin into several compartments with specific sedimentary recordings or rift activities. The depositional environment in the Central Segment is overall fluvio-lacustrine since the Valanginian until the Barremo-Aptian boundary, where first marine floodings are recorded. Nevertheless, each compartment shows specific sedimentation. Throughout Upper Aptian, the depositional environment becomes lagoon, allowing the salt deposit; finally Albian times records a marine sedimentation. The Central segment appears to display a real asymmetry during middle Aptian, around 118 Ma, before salt deposit.