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Southern Central Atlantic Break-up: from continuous to forced break-up

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The Southern Central Atlantic rifting is considered to have ended at about 190Myrs while the CAMP (Central Atlantic Magmatic Province) was still active. Recently acquired seismic profiles in the deep offshore Senegal and Mauritanian domain, provide detailed images of continent-ocean transition and the first oceanic crust architecture. Their interpretation is the opportunity to describe the progressive interaction between the final rifting processes and the magmatic supply due to the hot spot activity, the architecture and timing of break up and the oceanic crust production.
In the North, seismic data and gravity/magnetic inversions suggest hyper extended continental crust with possible mantle exhumation. It graded toward the east to a poorly imaged Moho and a strongly faulted thin oceanic crust or exhumed mantle associated to hyper slow oceanic accretion (∼0.8 cm/yr during the first 20Myrs). At 170 Myr, the spreading rate increased to nearly 2 cm/yr and the oceanic crust facies evolves to an extensively faulted 6km thick oceanic crust (Penrose type).
In the South, the continental crust is little thinned and the transition to oceanic crust is sharp. Despite a general hyper slow spreading, the oceanic crust is abnormally thick (12-14km).
From the mapping of the oceanic crust facies and the crustal domains inherited from the rifting, we concluded that, in the South, the break-up had been forced through a thick continental crust due to the remnant activity of the CAMP Hotspot. Its activity continued during the spreading, supplying the ridge to form a thick oceanic crust despite the slow spreading rates. In the North, the magmatic pulse arrived far after the break-up. The absence of magmatic supply seems to favor the development of a hyper-extended margin and the transition toward a stable oceanic crust is continuous.