Deep structure of the Santos Basin - São Paulo Plateau System, SE Brazil

Introduction
The Santos Basin/ São Paulo Plateau System (SB/SPP) consists along the southeastern Brazilian margin (Figure 1). While the boundary based on the seafloor magnetic anomalies is very narrow and Hall [1998], the SB/SPP consists of a 750 km wide bathymetric basin largely covered by a Late Cretaceous-Paleocene Jurassic brown coal and associated mineral deposits of probable economic interest. The basin is bounded to the northeast by the Brazil Margin and to the southwest by the Santos and São Paulo Basin, with the SB/SPP being an active rift domain characterized by large and continuous seaward-dipping reflectors (SDRs) that opened between 139.5 Ma and 130 Ma, from the Central Segment [White et al., 1992] and continental crust [Christensen and Mooney, 1995].

The SanBa experiment
In order to yield new insights on the crustal nature of the SB/SPP, six multi-channel (MCS) and coincident wide-angle seismic profiles were acquired between March and August 2014 by the O/C Veritas (Figure 1). The dataset consists of 900 km of swaths at an acquisition rate of 1.8 km/s. The MCS nodes were situated 2.5 km along profiles and 24 km apart, with the OBS (Ocean Bottom Seismometers) spaced at 6 km intervals along the MCS Profiles (SB01 to SB06). The OBSs were located at depths varying from 500 m to 5000 m below the sea level. The dataset also included the inclination of the profiles and the navigation data, which were recorded using the TrimbleGeoExplorer. The OBSs and LSS (Long-Range Seismic Streamer) data were modeled using the ray tracing and two-dimensional iterative damped least-squares techniques. The OBS and LSS data were processed using the Veritas (8) LETG-Nantes Géolittomer, Université de Nantes, France)

SSPS segmentation
The SSPS velocity models show a clear segmentation of the Santos Basin– São Paulo Plateau System. No correlation exists between the upper crustal segmentation and the lower crustal segmentation (Figure 2). The maps in Figure 2a illustrate the velocity contrast and divide the crustal sections by colors.

- Domain D - Proto-oceanic crust
- Domain B - From very thin continental crust to an anomalous crust

Conclusions
- Domains CC & N - Continental crust necking
- Domain A & C - Thinned Continental Crust

The SSPS is an aborted rift with a thickness that is insufficient to isolate the domain characterized by large and continuous seaward-dipping reflectors (SDRs) that opened between 139.5 Ma and 130 Ma, from the Central Segment (Figure 9). Moulin et al. [2012] have shown that the SSPS might be considered as a buffer zone where rifting was oblique to the general opening direction of the Central Segment (Díaz 10).

Geodynamic framework
Our results on the arc-ophiolitic and eastern portions of Santos Basin– São Paulo Plateau System must be integrated into the global framework of evolution of the South Atlantic Orogeny (Figure 10). Moulin et al. [2012] have shown that the SSPS might be considered as a buffer zone where rifting was oblique to the general opening direction of the Central Segment (Díaz 10).

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