

## **Tectonic and Stratigraphic Evolution of Pelotas Margin (Southeastern Brazil): Deep Seismic-Reflection Images from Long-offset, Prestack Depth Migrated (PSDM), Regional 2-D Data**

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The Pelotas Basin offshore in southernmost Brazil potentially offers a large petroleum province and an example of a classic extensional volcanic margin. Regional deep imaging (10 km offset, 18-sec record), pre-stack depth migrated (PSDM to 40 km) 2D seismic data have identified large areas underlain by thick (>10 km) Mesozoic-Cenozoic age sediments. The Moho is well imaged and indicates a crustal thickness from 15-40 km landward of the COB, to the typical 10-12 km for the oceanic crust.

More than 10,000 line km of data have been acquired, extending from the limit of Uruguayan waters northwards into the southern parts of the Santos Basin and São Paulo Plateau. The seismic lines are paired with shipboard gravity and magnetic profiles that have been used in defining processing parameters as well as in iteratively testing the tectonostratigraphic interpretations.

This program has permitted the mapping of the tectonic boundary that separates offshore Brazilian salt basins to the north from the Pelotas Basin, which lacks a salt sequence. This boundary appears to connect landward to pre-existing tectonic lineaments in the Pre-Cambrian basement and seaward to the Florianópolis Fracture Zone. During the early stages of continental separation, open-ocean circulation existed in the Pelotas and conjugate African margins while restricted circulation farther north, across the newly opened South Atlantic, resulted in the deposition of the thick Aptian-age salt layer.

One of the presumed signature features of volcanic margins, the seaward dipping reflectors (SDRs), are well imaged as a 5-10 km thick zone across the continent-ocean transition. This zone can be mapped all the way south to the Argentine margin, but is rare north of Pelotas. Thus, we believe that the Pelotas margin is probably the only part of Brazilian margin that should truly be called “volcanic”.

The data image a pre-rift (Jurassic?) sequence which may be partly coeval with sediments beneath the Paraná volcanics onshore. Also observed are reflector packages in a narrow zone of Barremian-age syn-rift, perhaps containing lacustrine source rocks. Overlying these sequences are the thick SDRs, which may also contain interbedded sediments. Subsequent drift sequences are thick (~8 km), and should have considerable opportunity to provide reservoir rocks as well as traps. The basin-scale imaging provided by this data should result in a better understanding of the petroleum potential of the Pelotas margin.