Conjugate Pelotas and Orange Basins Source Rock Evaluation

South Atlantic Conjugate Margins: Reconnecting Basins with Recent Discoveries and Exploration Opportunities, December 2022
https://store.aapg.org/detail.aspx?id=VTS-64599
.

Rodriguez, Karyna [(1)]; Hodgson, Neil [(1)]; Rodriguez, Pablo [(2)]; Gristo, Pablo [(2)]

(1) Spectrum Geo Ltd.

(2) Exploración y Producción, ANCAP

Despite the recent potentially giant Graff and Venus discoveries in the Orange Basin offshore Namibia, source rock remains the key element to de-risk in the conjugate frontier Pelotas basin offshore southern Brazil and Uruguay.

A full source rock de-risking exercise has therefore been carried out which included plate tectonic reconstruction and analysis of the tectonostratigraphic evolution to identify suitable environments for source rock deposition. Conjugate Margin evidence was key, together with well information, geochemical seabed sampling and coring results as well as sea surface naturally occurring oil seeps. Seismic evidence included identification of regional high amplitude soft kick events associated with AVO Type IV anomalies, considered to be positive source rock character similar to that identified offshore Namibia (Davison et al., 2018) which indicated the presence and maturity of a world class source rock.

Other seismic evidence included DHIs (Direct Hydrocarbon Indicators), fluid escape and seabed features as well as BSRs (Bottom Simulating Reflectors) found at the base of methane hydrate zones. Based on gas hydrate stability conditions, water bottom temperature and thermal conductivity, the thickness of the methane hydrate stability zone can be used to estimate shallow geothermal gradients and associated surface heat flow (Vohat et al., 2003 and Rodriguez et al., 2021).

The results indicate that the proven Aptian source rock offshore Namibia is also present in the Pelotas Basin and is modelled to be thick, good quality and mature for hydrocarbon generation. This together with seismic events associated with extensive reservoir presence, point to huge yet unexplored potential in the Pelotas Basin.