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South Atlantic Margin Salt Basins - Testing Pre-Salt Crude Oil Genetic Relationships using Source Rock Data from West Africa and Brazil

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After nearly fifty years of investigation, a super-regional view of South Atlantic conjugate basins has been developed, as the set of representative crude oils exceeds 1700 from an initial selection of <100. Detailed geochemical data from these representative samples has been tested against their tectono-structural setting, comparing paleo-reconstructions of the region against the paleo-depositional settings inferred from the oils data.

The present study examines in greater detail the genetic relationships established for oils derived from source rocks deposited in tectono-structural settings corresponding to Syn Rift I (Upper Jurassic), Syn Rift II (Neocomian), Syn Rift III (Barremian), and Transitional/Evaporitic (Aptian) environments (as defined within EBRIS; Chang et al., 1992).

Screen and detailed geochemical data for more than 5000 potential source rock samples from multiple nonexclusive studies of Brazil and West Africa has been assembled. These data, that represent Lower Cretaceous to Jurassic sediments, are used to evaluate the stratigraphic and regional distribution of pre-salt source rock horizons and to classify source rock types with respect to sequence age and depositional environments. Source-to-oil correlations are established where possible and depth/temperature thresholds for effective hydrocarbon windows in the region are determined by employing a variety of paleothermometers.