

Pre-Salt and Salt Geometry as Controlling Factors in Post-Salt Tectonics

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Regional pre-stack depth migrated (PSDM) seismic data, acquired by GX Technology (CongoSpan) along the West African margin of Angola, Congo and Gabon, has provided deep (25 km) images of the crust, sub-salt sediments and overlying sediments from the shallow water shelf (20 m) out onto the abyssal plain (4000 m). One of the advantages of PSDM data is that images are in depth. This has revealed the geometries of the pre-salt sag basin lows and paleo-rift flank highs. These highs and lows influenced salt deposition, and the styles of the overlying salt deformation. This work focuses on understanding the relationship of the styles of the deformed overlying post salt sediments and salt, to the pre-existing subsalt structures.

Estimates of the original depositional thickness of salt have also been possible using the PSDM data. Significant variations in depositional thickness are associated with crustal thickness, and crustal-scale faulting that continued into the drift (Albo- Aptian) as displacement on the primary rift faults developed a mega- accommodation zones.

An extensional style of salt tectonics developed during the Albian, as blocks of sediment moved down dip towards the sag basin depocenters. With the uplift of the African craton in the Miocene, rafts of shelfal sediments were remobilized and continued to move downdip into the sag depocenters. Salt diapirs are observed to overlie the centers of the sag basin, and the beginning of the compressional salt features is on the upslope, seaward side of the sag basin. Salt thrusts and nappes are observed where salt is extruded over the rift flanks. Within the drift grabens that developed in the accommodation zones, "snake heads" of allochthonous salt have been observed. All of these various styles of salt deformation can be associated with pre-salt features.