

## **Strati-structural Evolution and Its Signatures on Sedimentation Pattern of the Olifants Subbasin, Orange Basin, South Africa**

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The Orange basin located on the Southern West coast of the African continent is conspicuous by the prominent bite on its coast line which is a manifestation of its active East west trending transects oblique to the mega rift axis. The Orange basin a quintessential passive margin, owes its origin to breakup of the African craton on incipient sutures from Gondwana land, followed by rifting and drifting caused by the creation of oceanic basement and opening of the South Atlantic Ocean during Jurassic /Early Cretaceous. The Orange basin in The North is flanked by the faulted northern margin of Salado basin while the southern extent is dissected by a transect and meets with the Columbine -Agulhas arch. These tectonic elements have significant impact on the sedimentation pattern and virtually divide the basin into individual sub basins with distinctive sedimentation signatures. These sub basins are confirmed by GM data in the region and Authors have identified and named the southern part of Orange basin, which is fed mainly by Olifants River, as the Olifants sub basin. This sub basin is sampled by two exploration wells, and a DSDP well 361 is also considered to evaluate the hydrocarbon generation potential of the sub basin.

The Regional seismic profiles calibrated by well data, indicates that pre /Early rift sediments are confined to localised half grabens and are overlain by aggrading shelf margin sediments with little or no deformation. These sediments are sourced from margin tilting during the elastic rebound phase of rifting. The second spate of sedimentation during Tertiary was characterised by margin instability resulting in development of a coupled growth fault and toe thrust system . This switching and activation of tectonic elements and resulting sedimentation style has shifted the location of overburden accumulation in this hitherto less explored sub basin , and it is envisaged that a rapid rate of sedimentation, and optimally buried source facies might have generated commercial accumulation of hydrocarbons as evidenced by the two wells drilled in this sub basin. The model postulated by authors will open up substantial acreage for exploration in this scantily sampled Oliphants sub basin.