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Frontier Exploration in East Africa - Beyond Seismic

Hydrocarbon exploration over large, frontier areas can be time consuming, costly and incomplete due to the lack of good seismic data coverage. Over the deepwater areas of East Africa, modern seismic data is sparse, old seismic data suffers from low data quality and correlation is difficult given the poor well control. An attempt to define and characterise the hydrocarbon potential of the offshore basins of Tanzania, Kenya, Somalia, Madagascar and the Seychelles relies largely on regional tectonic and stratigraphic models.

Gravity and Magnetic (Potential Field) data provide a powerful, additional constraint to validate the tectonic, structural and stratigraphical models, initially derived from on- and near shore well data and seismic control. A key success factor is good calibration with seismic data to understand the geological contributors affecting the observed potential field data. Only then, the potential field data can be processed to extrapolate structural trends beyond the seismic data coverage.

Some of the benefits of integrating potential field data are: - crustal thickness estimates support 3-dimensional maturity modeling and therefore improve the assessment of the probability of charge; - defining the structural frame of the basin and the regional paleogeographical evolution provide a first estimate of likely sedimentation focus, contributing to the assessment of reservoir quality / quantity; - extrapolation of structural fairways and grain allows an initial estimate of field size distribution beyond seismic coverage; and - potential field data (along seismic lines) can be valuable in differentiating lithologies e.g salt from shale and locally gas from volcanics.