AAPG International Conference
Barcelona, Spain
September 21-24, 2003

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Salt Tectonics in the Offshore Majunga Basin, Madagascar

The offshore Majunga Basin of NW Madagascar was perhaps the most poorly understood salt basin in Africa prior to the recent acquisition of the first systematic and regional seismic data set. New ~4,500 km 2D data, collected in two separate surveys, allowed the definition of several salt-tectonic domains in the deep-water area of the basin.

The Lower-Middle Jurassic, syn-rift salt produced spectacular allochthonous tongues and canopies beneath the slope. The map-view extent of this domain is clearly controlled by the geometry of the underlying structure forming large, normal-fault bounded basement ridges. In the middle of the salt basin, the salt edge displays a major basinward salient with well-developed deep-water toe-thrust anticlines providing large structural traps. The location of this fold-train coincides with an inferred transform zone disrupting the basement ridges, allowing gravity sliding and spreading towards the deep-water portion of the Majunga Basin. In the area of the toe-thrust anticlines the salt appears to ramp up through the Upper Jurassic and Lower Cretaceous strata forming an exceptionally broad allochthonous salt sheet.

Preliminary results indicate that the Majunga Basin, as part of the Madagascar subplate, developed in a lower plate position as opposed to its upper plate counterpart in Somalia/Kenya on the African plate. This may have some implications for the overall prospectivity of the Majunga salt basin as opposed to other salt basins on the East African passive margin.