Geophysical Research Abstracts,
Vol. 11, EGU2009-8812, 2009
EGU General Assembly 2009

The Gop Basin – A Possible Imprint of Early Oceanic Spreading Between Greater Seychelles and India

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The Arabian and its conjugate Eastern Somali basins were formed by the seafloor spreading at the Carlsberg Ridge since Early Tertiary (anomaly 28n; ~62.5 Ma). The reconstruction model at anomaly 28n suggested existence of a wide swath of deep offshore region (Gop and Laxmi basins) between the Laxmi Ridge and the India-Pakistan continental shelf. In the present study we focus on the Gop Basin, where the important constraints about the early geodynamic evolution of the Arabian Sea appear to exist. The nature of the crust underlying this basin remains a matter of debate, with views varying from volcanics-intruded thinned continental crust to oceanic crust formed by a now extinct spreading centre. Our interpretation of an updated compilation of marine geophysical data supports the oceanic nature of the crust underlying the Gop Basin, where the Palitana Ridge represents the extinct spreading centre related to an episode of early oceanic spreading between Greater Seychelles (Seychelles-Laxmi Ridge block) and India. Our magnetic modelling shows that the well correlatable, prominent but short sequence of magnetic anomalies in the Gop Basin does not allow a unique identification; it can be reasonably explained either as A31r - A25r (~69 - 56 Ma) or as A29r - A25r (~65 - 56 Ma) sequence. Both the models suggest that spreading in the Gop Basin was significantly affected by the nearby onset of the Reunion hotspot at ~65 Ma, which formed the Deccan Traps on the adjacent western Indian mainland.