

Deep Water Sedimentary Structural Elements Description Based on Multi-Seismic Attributes in the Offshore East Africa

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Abstract

Deep water sedimentary systems are widely developed in the offshore East Africa. Source, paleogeomorphology, sea level change and bottom current are the main factors affecting the formation and evolution of gravity current depositional system in the Offshore of East Africa, especially the influence of bottom current, which is an important factor different from other gravity fluid systems. Based on the analysis of seismic reflection characteristics, Multi-attributes, five sedimentary structural elements are identified in East African. (1) Unilateral confined channel complex shows that one side is confined by overbank or levee deposits, while the other side is weaker confined. The channel migrated to the weakly confined side are very obvious, and there is a clear erosion interface between the weakly confined side and adjacent strata. (2) Bilateral Confined channels are mainly formed by the erosion of turbidity current and the confined effect of deposition of overbank or levees. The filling part of the channels is V or U, and the levees on both sides are gull wing. (3) Cluster Clustered frontal splay usually developed in channel-lobe sedimentary system, and are located in sandstone sedimentary areas close to the downslope of the main channel. Seismic profiles show that the splay shows strong amplitude and moderate continuity of reflection characteristics, and locally has multi-stage lobe overlapping characteristics. (4) Compared with Cluster Clustered frontal splay, elongate frontal splay distribute at the relative edge of turbidities depositional system, and transport distances are far away. The grain size of sediments is relatively fine. Seismic profiles show strong amplitude and strong continuous reflection, which is a single or multiple

parallel or sub-parallel strong reflections. (5) Mass Transport Deposit (MTDs) is the gravity flow produced by the sediments along the wings of continental slopes, canyons. The MTDs are characterized by transparent blank reflection, weak amplitude and poor continuous reflection. Through this study, the deep-water sedimentary structure elements chart and deep-water sedimentary system model were established, which directs reservoir prediction and target evaluation, and provided useful technical support for petroleum exploration in this area.