

Paper Number: 3776

Figure 1: Schematic diagram of Sedimentary Evolution during the Shahejie Formation in Liuzan.

## Lithology-Based Sequence-Stratigraphic Framework and Sedimentary

### Evolution of the Cenozoic Succession in the Northeastern Nanpu Sag, China

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The Nanpu Sag, located in the northeast of North China Craton, is a Meso-Cenozoic petroliferous sag. Various models have been proposed to reveal the distribution of sand bodies and hydrocarbon accumulation regularity, but controversies remain. To address this issue, we present a lithology-based sequence-stratigraphic framework of Liuzan Area in the Nanpu Sag to figure out the complex spatial and temporal facies relationships. Based on the interpretation of the seismic reflection terminations, wireline log stacking patterns and lithological data, six third-order sequences were identified in the Shahejie Formation.



Seismic reflectors typically coincide with key sequence-stratigraphic surfaces. Sequence 1 and sequence 2 are mainly dominated by sub-parallel seismic reflection configuration, indicating the lacustrine deposits. Progradational reflection configurations recognized in the margin of study area characterize fan-delta deposits. Different from the sequence 1 and sequence 2, sequences 3 to sequence 6 were dominated by large progradation reflection configurations along the source direction, and mound or lenticular seismic reflection configurations perpendicular to the source direction. These seismic reflection configurations indicate

multi-stage fan-delta deposit systems. In each depositional sequence, parasequences can be grouped into retrogradational and progradational parasequence sets. Sand-shale ratios in retrogradational parasequence sets decrease upward indicating expansion of the lacustrine system. The progradational parasequence sets are dominated by coarse-grained clastic deposits, and developed thicker sandstones compared to retrogradational parasequence sets. Establishment of a high-resolution sequence stratigraphic framework emphasizes the reservoir potential of the terrestrial lacustrine sediments and provides a useful guide to identify potential areas for hydrocarbon exploration.

