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Structural and Sequence Stratigraphic Analysis of the Onshore Nile Delta, Egypt.

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The Nile Delta is considered the earliest known delta in the world. It was already described by Herodotus in the 5th Century AC. Nowadays; the Nile Delta is an emerging giant gas province in the Middle East with proven gas reserves which have more than doubled in size in the last years. The Nile Delta basin contains a thick sedimentary sequence inferred to extend from Jurassic to recent time. Structural styles and depositional environments varied during this period. Facies architecture and sequence stratigraphy of the Nile Delta are resolved using seismic stratigraphy based on (2D seismic lines) including synthetic seismograms and tying in well log data. Synthetic seismograms were constructed using sonic and density logs. The combination of structural interpretation and sequence stratigraphy of the development of the basin was resolved. Seven chrono-stratigraphic boundaries have been identified and correlated on seismic and well log data. Several unconformity boundaries also identified on seismic lines range from angular to disconformity type.

Furthermore, time structure maps, velocity maps, depth structure maps as well as Isopach maps were constructed using seismic lines and log data. Several structural features were identified: normal faults, growth faults, listric faults, secondary antithetic faults and large rotated fault blocks of manly Miocene age. In some cases minor rollover structures could be identified. Sedimentary features such as paleo-channels were distinctively recognized.

Typical Sequence stratigraphic features such as incised valley, clinoforms, topsets, offlaps and onlaps are identified and traced on the seismic lines allowing a good insight into sequence stratigraphic history of the Nile Delta most especially in the Miocene to Pliocene clastic sedimentary succession.