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**Multi-Dimensional Seismic Attributes and Density  
Models of the Hydrocarbon Plays Inferred From  
Seismic Reflection and Bouguer Gravity Data at  
Faraskour Region in Nile Delta Basin, Northern Egypt**

A Thesis submitted for Partial Fulfillment of the Requirements for the  
Master Degree of Science in Geophysics

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# ABSTRACT

The main objective of the present study is to identify the possible remains of gas potentiality and to delineate the structural–stratigraphic characteristics at the on-shore Faraskour Region, in the eastern part of the Nile Delta Basin (NDB), using modeled seismic reflection data and attributes analysis. The integrated use of seismic attributes (coherency, AVO modeling and analysis, and amplitude extraction) added significant information about the hydrocarbon potentiality, facies and the minor geological structures. The obtained three dimensional (3D) seismic interpretation results were correlated with the known regional structural–stratigraphic fashion of the western NDB and showed a satisfied matching, added more details about hydrocarbon trapping and gave a new possible gas reserve at the study area.

The role of the gravity tool was trying to understand and delineate the possible deepseated Structure in the deeper geologic section which can't investigate it by the surface seismic. Therefor One of the two main structure trends is obtained from The horizontal gradient (in x-direction) of the residual gravity data which showed shallow structure trend in north-South which representing the Sidi Salem faults that detached in the Oligocene section and also the other trend east-west with depths range from 3 to 6 km was recognized by the results of Euler deconvolution analysis which fit in direction with the hinge zone faults and hit top the basement which obtained from 2D and 3D gravity modelling. So the second main trend which extended from east - west is the most possible trend charging some of the shallow reservoirs with gas as a vertical migration with high Gas Condensate Ratio (CGR) and increase the possibility to charge the deeper reservoirs as well.



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