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Rock physics model and AVO simultaneous inversion for west Dikirnis field, onshore Nile Delta, Egypt

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The Nile Delta is considered as the most significant gas province in Egypt and one of the most promising areas for future hydrocarbon exploration in North-Eastern Africa. The area lies to the north and south of the Nile Delta hinge zone and geologically comprises a thick sequence of tertiary aged deltaic sediments from recent to Oligocene age overlying older Mesozoic sequences. Predicting sand distribution and reservoir presence are the major exploration and development challenges associated with the complex geological settings in onshore Nile Delta. Different angle stacks have been examined to evaluate the seismic correlation with the lithology, rock properties and fluid characteristics with the emphasis on the Far and Ultra-Far low-impedance responses. The simultaneous AVO inversion has been implemented to shed light on the reservoirs complexity in which seismic reflection amplitude is inverted to P-impedance, S-impedance and density. A rock physics framework has been built for quantitative analysis where elastic properties are derived to describe the reservoir heterogeneity. We have applied the algorithm to West Dikirnis field, a strong correlation was observed between reservoir properties and both impedances as well as density. The results yielded images of reservoir elastic properties that better describe the local distribution of the sand deposits and characterize the gas sand in Qawasim formation.

Biography

Walaa Fathy has 18 years experience in oil and gas industry working in different international oil companies. Presently he is working as a Staff Geophysicist in Petroceltic International Companies. He holds a Bachelor's degree in Geophysics (1995) and a Master's degree in Geophysics (2011) and currently pursuing PhD from Heriot Watt University in Reservoir Geophysics. He can be considered as an oil and gas finder by having several oil and gas discoveries in the Western desert and the Nile Delta in Egypt.

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