

Future Exploration Strategy of a Frontier Offshore Campeche Area Provided by Basin Modeling

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Previous regional one-dimensional basin modelling studies suggest a possible deficiency in hydrocarbon charge originated by low source rocks maturity in a frontier region of the northeastern offshore Campeche production area. Updated geological, geophysical and geochemical interpretation of the area and a combination of multi-one-dimensional with two- and three dimensional basin models, were developed. An evaluation of the hydrocarbon charge, pathways and types of migration, as well as volumes of trapped hydrocarbons were determined at each prospect. Two-dimensional models contributed to the detection of possible seal failures and to the assessment of the amount of hydrocarbon losses during migration. By integrating these results to multi-one-dimensional basin models it was possible to visualize that the biggest traps do not necessarily contain the highest hydrocarbon volumes. The real three-dimensional model allowed us to observe changes of petroleum saturations in three-dimensions through time and corroborate the predominant migration style. It also helped to identify structures that might have the most attractive hydrocarbon saturations. The application of these tools allows us to do a more precise geologic risk analysis and improve the ranking of exploration opportunities by better understanding of both the regional source rock maturity and the volume of trapped hydrocarbons in each prospect. This study has provided a new exploration strategy on this frontier area.
