Petroleum Resource Potential of the Canada (Amerasian) Basin Rift Margin of the Beaufort-Mackenzie Basin, Arctic Canada

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Abstract

The southern onshore part of the Canada (Amerasian) Basin rift margin is a proven hydrocarbon province, with seven significant discoveries, predominantly gas in structural traps of Mesozoic-Cenozoic clastic and Paleozoic carbonate reservoirs. A comprehensive study of marine reflection seismic data, including seismic inversion and spectral decomposition, and geological modeling and statistic inference based on machine learning techniques, provides insights into possible oil and gas occurrences and a petroleum system model for the offshore northern part of the rift margin. Combined with other geological constraints, our study suggests that the offshore rift margin becomes more oil-prone northward and may have significant petroleum resource potential. This paper illustrates the geological and geophysical evidence of potential petroleum occurrences, petroleum system model and oil and gas resource estimates in the offshore rift margin.