



Three-dimensional geological modelling workflow for fractured hydrocarbon reservoirs in the Grosmont Basin, Canada

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Carbonate rock masses of the Grosmont Formation is one of the important hydrocarbon reservoirs in Alberta, Canada. The carbonate rock masses have been experienced various stages of diagenesis, and produced structurally strong heterogenic reservoir. The characteristics of reservoir are affected by hydraulic and mechanical properties of intact rocks as well as by fractures such as joint, fault, fractured zone, and bedding plane. This study is focused on characteristics of fracture distribution in the carbonate rock masses of UG3 unit of the Grosmont Formation. Nonconfidential cores of UG3 unit from total of nine boreholes were logged in Calgary at the Alberta Energy and Utilities Board Core Research Centre to collect and characterize the fractures in the rock domain of interest. The first part of the study deals with the development of a three-dimensional hydrocarbon reservoir visualization model for a section of the Grosmont Formation based on lineament analysis as well as well-log data. The results of the homogeneity tests performed on fracture data obtained from core logging to identify structural homogeneity of the study area are discussed in the second part of the study. The third part of the study is focused on the results obtained for three-dimensional fracture network model for the statistically homogeneous regions considered of the UG3 unit based on stochastic approach using the logged fractures at the study area. Finally, the workflow for three-dimensional geological model of fractured hydrocarbon reservoirs is suggested including appropriate discussions and conclusions.

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