

Characterization of Fractured Reservoirs: Mapping Fracture Networks and Linking Fracture Density to Reservoir Properties using Core and Borehole Image Data - A Case Study

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Abstract

The presence of fractures in Algerian oil and gas fields is critical for the effective flow of fluids within the system. Accurate identification, description, and categorization of fractures in these fields are crucial for assessing formations and production planning. While image logs offer valuable information for describing fractured reservoirs, they may lead to erroneous fracture interpretations if used alone. Therefore, a comparison with data obtained from cores is necessary to provide a complete characterization of the fracture network. This article describes the mapping of fracture networks in five case studies, accounting for the filtering effect caused by the imaging technique alone, using both core and borehole image data. The differences between the data from the two methods are highlighted, and the benefits of reconciling them to improve our understanding of the formation being studied are discussed. Distributing fracture characteristics across an entire reservoir is a significant problem due to the uneven and frequently sparse distribution of well-based fracture calibration. For distributing fracture parameters that are almost always undersampled, a link between well-based fracture density and other better-constrained reservoir properties must be established. To address this, comparisons between fracture density and petrophysical characteristics that may impact reservoir characteristics have been made.