

Image Based Petrophysics Result for Reservoir Characterisation

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The characterization of carbonate reservoirs is a complex subject. Over the years there has been ongoing study to develop a number of different techniques and approaches, which are now available in the oil industry. This presentation will cover carbonate reservoir characterization methods with an emphasis on the use of bore hole image data.

In order to derive a much better idea of reservoir volumetrics, reservoir information such as porosity, its distribution, and textural information, can be obtained using a method called Image Petrophysics. In Carbonates, secondary porosity (a key element in well productivity) can be identified from the image, in the near well bore region. Image derived porosity distribution calibrated with either core data or open-hole log data can be obtained without losing the high resolution character of the image resulting in a high resolution petrophysical answer.

A typical image petrophysics workflow starts with estimating porosity and V_{clay} from the image and the standard open hole logs, followed by grain size, sorting and permeability distributions from the Kozeny-Carman and Coates-Timur relationships. Based on these image derived results, lithofacies can be defined using a neural network approach which becomes a useful tool for reservoir characterization .

The presentation includes discussion of a case study and outlines the workflow.