# A Tool for the Reduction of Uncertainty: Pore Network Characterization from Drill Cuttings

Douglas Fisher
Alberta Research Council
fisher@arc.ab.ca

## ABSTRACT

The process of creating the best reservoir model for field scale simulation rests on the quality of data. Much of this information is taken from logs, which in turn are related to correlations between core samples and the log responses. If better estimates for the permeability, porosity, and other flow characteristics, such as relative permeability could be obtained, the resulting description of the reservoir used for the simulator would provide a significant reduction in the uncertainty for the predictions produced.

Since it is unusual to provide core from every well in a field, if we could provide better estimates of the primary rock properties in order to improve the quality of the log correlations, we would be able to produce better reservoir models. The use of drill cuttings to provide estimates of rock properties is not an entirely new idea, but if we include an improved model for the description of flow characteristics the values of permeability predicted will be better, and the correlations between porosity and permeability needed for the log interpretations, will be much more closely related to the local reservoir conditions.

The use of petrographic image analysis to provide this rock property data, as well as mercury capillary pressure tests done on samples of cuttings from the wells in question, give us the more localized source of information. A computer program has been developed at the Alberta Research Council, which takes data from either of these methods, and allows us to create a description of the pore network called a pseudo-flow curve. This curve coupled with a detailed database of rock samples, allows us to produce reasonable predictions of permeability, as well as information about the major distribution of the fluid flow in the pore network.

The ability to predict one of the relative permeability curves from mercury capillary pressure data has been described in the literature, but when a more phenomenological mathematical model such as the one used to produce the pseudo-flow curves, is used to describe the flow, we can then make a better prediction of this parameter as well.