

Magnetic Resonance Imaging of Fluids in Petroleum Reservoir Core Plugs

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ABSTRACT: Magnetic Resonance Imaging (MRI) is well known as the premiere diagnostic imaging modality in clinical medicine. Many investigators have considered its employment to study fluid content (saturation), fluid environment (pore size distribution) and fluid flow (permeability) in reservoir rocks over the last twenty five years. Simple translation of clinical MRI methods and ideas to realistic porous media (reservoir rocks) has been unsuccessful and for many years MRI for petroleum studies was considered impossible.

The UNB MRI Centre has pioneered a series of new quantitative MRI methods that now permit non-invasive studies of fluid saturation, the pore size distribution and permeability in a wide range of reservoir rocks. Imaging measurements, executed on core plug samples, are sufficiently rapid that one can envision a wide range of dynamic studies, ranging from special core analysis measurements to model core flooding studies for enhanced oil recovery, where one employs MRI to examine spatially and temporally resolved fluid behaviour and fluid displacement.

In this lecture Dr. Balcom will introduce basic ideas of magnetic resonance and spatial encoding then describe new methodologies for MRI studies of fluids in porous media. These ideas will be illustrated through select examples of petroleum studies recently undertaken at UNB.

ALL ARE WELCOME!!!