22 Digital Petrophysics
Imaging, Modeling, and Experimental Challenges Related to Porous Media in Oil Fields

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22.1 INTRODUCTION

The complex interaction of liquids, gases, and solids at the pore scale is of interest in many areas of geoscience including oil and gas production, enhanced oil recovery, hydraulic fracturing, analysis of shale oil and shale gas, and carbon sequestration. This chapter presents the background and an overview of the rapidly evolving field of digital petrophysics: the imaging and modeling of porous media in the oil field along with experimental issues related to their understanding.

Modeling multiphase fluid flow at the pore scale gives us much insight into the physics at nanometer and micrometer scales. However, when interpreting and modeling porous media in the oil