

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Low field NMR study of the pre-asymptotic Stokes flow in porous rocks. PHILIP SINGER, Schlumberger-Doll-Research, GABRIELA LEU, EDMUND FORDHAM, PABITRA SEN — Dispersion in porous media is a powerful tool for probing the micro-geometry of porous media and the topology of flow fields. Pulsed field gradient nuclear magnetic resonance (PFG-NMR) methods are emerging as very powerful techniques for measuring fluid propagation and dispersion. However, high magnetic field techniques have proven limited since the susceptibility contrast between fluid components and solid interfaces can give rise to strong internal field gradients which corrupt the measurement, and which cannot be easily corrected for. Here for the first time we present PFG-NMR data on a variety of rocks (Bentheimer and Berea sandstones, Portland carbonate) using an unusually low applied magnetic field (2 MHz for protons) to limit these internal field artifacts. We find remarkable differences with the high field data, and we quantify these differences as a function of the mean flow velocity and the interrogation time.

Philip Singer
Schlumberger-Doll-Research

Date submitted: 28 Nov 2005

Electronic form version 1.4