Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Developing high-resolution carbon-13 and silicon-29 MRI of solids in sedimentary rocks ROBERT BLUM, SEAN BARRETT, Yale University, Physics Dept., RAVINATH VISWANATHAN, YI-QIAO SONG, Schlumberger-Doll Research, Cambridge, MA — Mapping pore structure and flow properties of sedimentary rock is directly relevant to current challenges in geophysics like carbon sequestration and oil/gas exploration. Such applications require detailed information about both structure and composition of porous rocks. However, existing scanning methods tend to be limited to gathering one or the other type of information. MRI could be used to measure both composition and structure simultaneously, but conventional MRI in such systems, which targets the proton signal of interstitial fluid, is severely limited by signal losses due to magnetic susceptibility inhomogeneity. Our lab has recently made advances in obtaining high spatial resolution (sub-400 μm)^3 three-dimensional ^{31}P MRI of bone through use of the quadratic echo line-narrowing sequence (1). In this talk, we describe our current work applying these methods to sedimentary rock, targeting the isotopes ^{13}C and ^{29}Si. We describe the results of characterization of limestone and shale samples, and we discuss our progress with producing MRI of these systems. (1) M. Frey, et al. *PNAS* **109**: 5190 (2012)

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Date submitted: 15 Nov 2013 Electronic form version 1.4