

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

MRFM based spectroscopy of GaAs DIMITRI ALEXSON, DORAN SMITH, US Army Research Lab — The apparent contradiction of how to perform NMR spectroscopy given the large magnetic field gradients present in MRFM is resolved by removing the magnetic field gradient while RF based NMR spectroscopic pulses are applied to the sample. This is accomplished by 1) shuttling (move) the sample away from the magnetic particle mounted on the cantilever, 2) apply RF spectroscopic pulse sequences to the sample, 3) store a component of the free induction decay along the z-axis, 4) shuttle the sample back to the cantilever, and 5) read out the magnetization stored on the z-axis with MRFM using an adiabatic rapid passage protocol (ARP). We will describe our progress on performing shuttle based spectroscopy of GaAs using MRFM. We will describe our measurements of T1 of Ga69 in GaAs with an inversion-recovery experiment. Using a single ARP sweep, the polarization is inverted and its recovery is monitored with a driven cantilever using the CERMIT protocol.

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Date submitted: 17 Nov 2010

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