Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Development of a scanning microwave microscope for localized ferromagnetic resonance measurements[1] CHRISTIAN J. LONG, STEPHEN A. KITT, JONGHEE LEE, Univ. of Maryland, SAMUEL LOFLAND, Rowan Univ., ICHIRO TAKEUCHI, Univ. of Maryland — We present an update on our research into the development of a scanning probe microscope capable of performing localized ferromagnetic resonance (FMR) measurements. The system is based on near-field microwave microscopy and uses a resonant microwave cavity operating at ∼2.5 GHz with a quality factor of ∼500. A sharpened metallic tip extends out of the resonator and produces a GHz frequency magnetic field in the region around the probe tip. By recording the change in the quality factor of the resonator as a function of applied DC magnetic field, we measure the absorption of microwave energy by a sample in the region around the tip. As an example system, we explore a single crystal Ga:YIG disk. For the case of a DC magnetic field oriented out of the plane of the disk, the FMR absorption lines form rings which are concentric with the disk axis. We find qualitative agreement between the observed absorption patterns and the absorptions patterns from numerical simulations of magnetostatic spin wave modes. The numerical simulations are carried out using the RKMAG software.

[1]This work was supported by the NSF-MRSEC at the University of Maryland, DMR 0520471

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Date submitted: 19 Nov 2009 Electronic form version 1.4