Abstract Submitted
for the OSS05 Meeting of
The American Physical Society

Magnetodynamics of Multi-Scale Magnetic Dots in the Vortex State DANE OWEN, CHENGTAO YU, MICHAEL PECHAN[1], Miami University, Oxford, OH 45056, JORDAN KATINE, LIESL FOLKS, MATTHEW CAREY, Hitachi Global Storage Technologies, San Jose, CA 95120 — A definite exchange energy is associated with the boundary between domains in ferromagnetic materials. For this reason, submicron dot samples do not energetically favor domain formation. Vortex structures have been predicted and experimentally shown to exist in these small samples. Four permalloy dot arrays (40nm thick circular dots in a square lattice with 100nm/150nm, 200nm/400nm, 500nm/550nm, and 1000nm/1100nm dot diameters/periodicities) were fabricated with e-beam lithography. Magneto-Optical Kerr Effect measurements were used to show when the vortex state was supported in the dots and to determine the anisotropy as a function of the angle between the magnetic field and dot lattice sides. Spin dynamics of the permalloy dots were also measured by ferromagnetic resonance, and additional modes besides the main resonance were shown to exist under certain conditions.

[1]Supported by US DOE

Dane Owen
Miami University

Date submitted: 18 Mar 2005 Electronic form version 1.4