Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Broad-Band FMR of Patterned Square Arrays of Square Permalloy Antidots

VINAYAK BHAT, University of Kentucky, JOSEPH SKLENAR, JOHN KETTERSON, Northwestern University, LANCE DELONG, University of Kentucky — We have used electron beam lithography to pattern 25-nm-thick Permalloy films with square arrays of square antidots of size $D = 300, 400, 500$ and $700$ nm and same lattice constant $d = 1000$ nm, using a lift-off technique. Broadband FMR was used to observe localized modes showing four-fold rotational symmetry for in-plane DC magnetic field. We have studied FMR spectra spanning the ferromagnetic hysteresis regime around 250 MHz, up to the saturation regime ending near 14 GHz, and observe the appearance and disappearance of various FMR modes, especially at frequencies below 7 GHz. We have observed history-dependent modes below 3 GHz that may be associated with domain walls.

1UK research supported by U.S. DoE Grant No. DE-FG02-97ER45653.