Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Probe-localized modes in continuous YIG thin films ROHAN ADUR, CHUNHUI DU, SERGEY A. MANUILOV, CHI ZHANG, DENIS V. PELEKHOV, HAILONG WANG, FENGYUAN YANG, P. CHRIS HAMMEL, The Ohio State University — The measurement of damping in precessing ferromagnets is obscured by the excitation of spin waves of different wavelengths due to defects and inhomogeneities in the ferromagnetic material. In order to reduce this parasitic broadening the magnetic mode can be confined to small volumes (nm to μm) either by external fields or by patterning. While nanostructures have shown size-dependent effects such as suppression of inhomogeneity when the size of the nanostructure is sufficiently small [1], it has been vital to consider the effect of imperfections in lithography that can cause edge damage and hence extrinsic linewidth broadening. In contrast, the dipolar field from a micron-sized probe magnet can be used to localize a mode in a continuous thin film without lithographic modification to the film. This technique of localized mode ferromagnetic resonance force microscopy (FMRFM) has been demonstrated in permalloy [2] at liquid helium temperature. In the present study we demonstrate probe-localized modes in a YIG thin film (t=25nm) measured at room temperature. Using FMRFM we explore the spatial and size dependence of inhomogeneity and damping of a localized mode within a continuous film. [1] C Hahn et al, 58th MMM conference BC-09 (2013) [2] I Lee et al, Nature 466, 845 (2010)

Rohan Adur
The Ohio State University

Date submitted: 15 Nov 2013 Electronic form version 1.4