Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Microwave modes of a two dimensional electron systems in the presence of a perpendicular magnetic anisotropy provided by a macroscopic ferromagnet BRENDEN MAGILL, NHMFL and MARTECH, FSU, L. W. ENGEL, NHMFL/FSU, M. P. LILLY, J. A. SIMMONS, J. L. RENO, Sandia National Laboratory — We report on a resonance in the microwave absorption spectrum of a high mobility two dimensional electron system (2DES) in a spatially varying magnetic field from a ferromagnet placed near the sample. The ferromagnet, made of Dy, cylinder or plates, with a hole through it. Microwave transmission between contacts capacitively coupled to the 2DES near the hole or cylinder shows a resonant absorption peak f_{pk} for holes and cylinders with varying radii, r_m, from 0.5 mm to .125 mm. The resonance absorption is present for a uniform external field $B_o$less than 1 T and only for specific magnetization of the ferromagnet with respect to B_0 with f_{pk} decreasing as either B_o or r_m increase. We will interpret the data in terms of plasma excitations similar to edge magnetoplasmons [1] confined along the magnetic field inhomogeneity by the large magnetic field gradients there. [1] See, for example, V. A. Volkov and S. A. Mikhailov, Sov. Phys.-JETP **67**, 1639(1988).

Brenden Magill
NHMFL and MARTECH, FSU

Date submitted: 21 Nov 2008 Electronic form version 1.4