Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Microwave absorption of a 2D electron system in spatially varying perpendicular magnetic field B. A. MAGILL, NHMFL/FSU, A. A. POLYANSKII, Advanced Superconducting Center, NHMFL/FSU , L. W. ENGEL, NHMFL/FSU, M. P. LILLY, J. A. SIMMONS, J. L. RENO, Sandia National Laboratory — We report on microwave measurements of a two dimensional electron system (2DES) in a spatially varying magnetic field, B_z, provided by a ferromagnet in proximity to the sample in a homogenous external field, B_{z0}. Dy, permalloy, and neodymium iron boron ferromagnets are used in two configurations, rods and plates with holes in them. The radius, r_m, of the rods or holes ranges from 0.125 mm to 0.5 mm. The microwave transmission of the 2DES exhibits a resonance which decreases in peak frequency as B_{z0} is increased. We observe peak frequencies from $\sim$ 9.5 GHz to150 MHz for external magnetic fields in a range from .02 Telsa to 1.5 Tesla. We will interpret the data in terms of plasma excitations similar to edge magnetoplasmons [1] but confined along the magnetic field inhomogeneity by the large magnetic field gradients there. The interpretation of the data will utilize profiles of the spatially varying magnetic field obtained by magneto optical imaging using iron garnet indicator films with an in-plane magnetization.

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Date submitted: 19 Nov 2009 Electronic form version 1.4