

Abstract Submitted  
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**Microwave mode of a two dimensional electron system in a spatially varying magnetic field** B. A. MAGILL, NHMFL and MARTECH, FSU, L. W. ENGEL, NHMFL/FSU, M. P. LILLY, J. A. SIMMONS, J. L. RENO, Sandia National Laboratory — We find a resonance in the microwave absorption spectrum of a high mobility two dimensional electron system (2DES) in a spatially varying magnetic field produced by a long ferromagnetic cylinder of Dy placed, with its axis perpendicular to the 2DES, on the surface of the sample. An external field  $B_0$  perpendicular to the 2DES is also applied. The resonance is present for  $B_0$  less than about 0.5 T, and depends hysteretically on  $B_0$ , apparently due to the Dy magnetization. The resonance peak frequency,  $f_{pk}$ , decreases with  $B_0$ , and is about 1.4 GHz for a 1 mm diameter cylinder and  $B_0=0.2$  T. For sufficiently large  $B_0$ ,  $f_{pk} \sim 1/B_0$ , reminiscent of an edge magnetoplasmon [1]. This work is supported by MARTECH. [1] See for example, V. A. Volkov and S. A. Mikhailov, Sov. Phys.-JETP **67**, 1639(1988).

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