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).