

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Internal Magnetostatic Potentials of Magnetization-Graded Hexagonal Ferrites C. SUDAKAR, Wayne State University, MI 48201, J.V. MANTESE, Delphi Research Laboratories, MI 48315, A.L. MICHELI, Delphi Research Laboratories, MI, 48315, R. NAIK, Wayne State University, MI 48201, G. SRINIVASAN, Oakland University, MI 48309 , S.P. ALPAY, University of Connecticut, CT, 06269, G. LAWES, Wayne State University, MI 48201 — Compositionally graded ferromagnetic material offer novel functional properties that have promising device applications. Our investigations of the internal magnetic field induced by a spatially varying magnetization in a compositionally graded ferromagnet will be presented. We discuss results on a hexagonal ferrite sample, with a variation in saturation magnetization of 30 emu/g over a sample thickness of 2.5 mm. The DC magnetization shows a small anisotropy depending on the direction of the externally applied magnetic field relative to the grading direction. This contribution from a grading induced magnetic field is more pronounced in AC susceptibility measurements, which show small gradient dependent shift in M' and M'' . We find a shift in magnetic properties corresponding to an internal magnetic field of 30 Oe, which is significantly lower than the predicted value of approximately 1900 Oe. The reasons for this difference and the implications of domains as the possible origin for the small H_{int} will be will be discussed.

Chandran Sudakar
Department of Physics and Astronomy, Wayne State University

Date submitted: 26 Nov 2006

Electronic form version 1.4