

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Tilted cores of magnetic vortices due to exchange bias¹ K. Y. GUSLIENKO, Department of Materials Science and Engineering, Seoul National University, South Korea, A. HOFFMANN, MSD and CNM, Argonne National Laboratory — Recently, the influence of exchange bias on magnetic vortices has been investigated experimentally.² By generalizing the rigid vortex model³ we develop an analytic model of the magnetization reversal in an exchange-biased ferromagnetic dot. We account explicitly for a non-uniformity of the magnetization reversal mode along the direction perpendicular to the layers. This non-uniformity allows the vortex core position to vary throughout the thickness of the ferromagnetic layer. We show that the geometrical confinement in combination with the interface exchange field leads to new asymmetries of the hysteresis loops.⁴ Namely, the critical fields for vortex nucleation and annihilation respond differently to the interfacial exchange bias, resulting in an asymmetry of the irreversible parts of the hysteresis loops in addition to the overall shift due to the exchange bias.

¹Supported by DOE under contract No. DE-AC-02-06CH11357.

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Axel Hoffmann
Argonne National Laboratory

Date submitted: 17 Nov 2006

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