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Size dependence and metastability of the vortex state in magnetic nanodots IGOR V. ROSHCHIN, CHANG-PENG LI, Physics Dept., UCSD, X. BATLLE, Dept. Fisica Fonamental, U. Barcelona, Spain, J. MEJIA-LOPEZ, Pontificia U. Catolica de Chile, D. ALTBIR, U. de Santiago de Chile, A. H. ROMERO, CINVESTAV, U. Queretaro, Qro., Mexico, IVAN K. SCHULLER, Physics Dept., UCSD — Magnetization reversal in structures with sizes comparable to or smaller than ferromagnetic domains has received much attention recently. We report on the magnetization switching as a function of size in sub-100 nm magnetic nanodots fabricated using anodized nanoporous alumina masks.[1] The hysteresis loops for the samples where a vortex is observed exhibit a non-zero remanence in accordance with Monte Carlo simulations.[2] Even if the vortex state is the ground state the dot may get stuck in a metastable single domain state. The size range for this metastability is determined from the energy diagrams for various vortex and non-vortex states obtained from micromagnetic simulation. Effects of commensurability and other parameters affecting stability of the vortex state will be discussed. Work is supported by AFOSR, US DOE, Spanish MECD, Catalan DURSI, FONDECYT, and CONACYT.
[1] C.-P. Li et al., J. Appl. Phys. **100**, 074318 (2006).
[2] J. Mejia-Lopez, J. Appl. Phys. **100**, in press (2006).

Igor V. Roshchin
Physics Dept, UCSD

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