Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Study of magnetization switching in synthetic antiferromagnets
COSMIN RADU, DORIN CIMPOESU, LEONARD SPINU, Department of Physics & Advanced Materials Research Institute, University of New Orleans, New Orleans, LA, USA, ALEXANDRU STANCU, Faculty of Physics, University Alexadru Ioan Cuza, Iasi, Romania — Synthetic Antiferromagnet (SAF) structures are very important in designing modern spintronic devices. The theoretical studies of the toggle writing mode in MRAM[1] use the concepts of SAF critical curve, which is a generalization of the astroid from the coherent rotation model in the case of uniaxial anisotropy. Although extensively studied theoretically[2,3] there are no methods proposed to experimentally determine the critical curve of a SAF structure. We propose a way for determining the critical curve of the switching fields using reversible susceptibility experiments (RS) and we prove this to be more sensitive to the switching characteristics of SAF structures than a regular hysteresis loop. For certain coupling strengths the entire critical curve can't be determined using standard RS experiments and a strategy for revealing these hidden parts of the critical curve is proposed. 1. L. Savtchenko, B. N. Engel, N. D. Rizzo, M. F. Deherrera, and J. A. Janesky, US Patent 6,545,906 B1, (2003). 2. S. Y. Wang and H. Fujiwara, J. Magn. Magn. Mater. 286, 27-30 (2005). 3. H. Fujiwara, S. Y. Wang, and M. Sun, J. Appl. Phys. 97, 10P507-10P507-5 (2005). Work supported by DARPA grant HR0011-07-1-0031.

Cosmin Radu
Dept. of Physics & Advanced Materials Research Institute,
University of New Orleans, New Orleans, LA, USA

Date submitted: 04 Dec 2007 Electronic form version 1.4