Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Spin structures and interactions of geometrically - confined head-to-head domain walls M. KLAUI, M. LAUFENBERG, D. BEDAU, L. HEYNE, D. BACKES, F. JUNGINGER, H. EHRKE, University of Konstanz, S. CHERIFI, CNRS-LLN Grenoble, ANDREA LOCATELLI, ELETTRA Trieste, T. KASAMA, R. DUNIN-BORKOWSKI, University of Cambridge, F. NOLTING, L. HEYDERMAN, Paul Scherrer Institut, U. RUDIGER, University of Konstanz — Using photoemission electron microscopy (XMCD-PEEM) and electron holography we have obtained high-resolution images of the spin structure of the domain walls, which allows us to determine the wall type and the wall width for different Co [1] and NiFe [2] wire and ring geometries. We determine the phase transition between the different domain wall types as a function of the geometrical parameters (width, thickness) [1,2]. Comparison with theoretical calculations [3] and micromagnetic simulations reveals the importance of local energy minima. The geometry-dependent height of the energy barriers separating the two wall types is derived. The energy barrier height is then directly measured by high-temperature (up to 600 K) imaging of thermally activated transitions from transverse to vortex walls [2]. By varying the spacing between domain walls, we determine the coupling strength that leads to a shift in the phase boundary [4].
[1] M. Klaui et al., APL 85, 5637 (2004); [2] M. Laufenberg et al., APL 88, 52507 (2006); [3] R.D. McMichael and M. J. Donahue, IEEE Trans. Magn. 33, 4167 (1997); [4] M. Laufenberg et al., APL 88, 212510 (2006).

Mathias Klaui
University of Konstanz

Date submitted: 16 Nov 2006 Electronic form version 1.4