Abstract Submitted
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Domain wall phase diagram and wall widths M. KLAUI, M. LAUFENBERG, D. BACKES, U. RUDIGER, Fachbereich Physik, University of Konstanz, C. A. F. VAZ, J. A. C. BLAND, Cavendish Laboratory, University of Cambridge, L. J. HEYDERMAN, F. NOLTING, PSI, Villigen, SPELEEM GROUP, ELETTRA TRIESTE COLLABORATION — The details of the spin structure of domain walls have recently become the focus of intense research due to the fundamental physical questions associated with domain walls (wall width, magnetoresistance, current-induced domain wall propagation). Using photoemission electron microscopy (XMCDPEEM) 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 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]. Comparison with theoretical calculations [2] and micromagnetic simulations reveals the importance of local energy minima and the geometry-dependent height of the energy barriers separating the two wall types can be 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. By varying the spacing between domain walls, we determine the coupling strength that leads to a shift in the phase boundary. [1] M. Klaui et al., APL **85**, 5637 (2004); [2] R.D. McMichael and M.J. Donahue, IEEE Trans. Magn. **33**, 4167 (1997);

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