

Abstract Submitted
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Domain overlap in antiferromagnetically coupled [Co/Pt]/NiO/[Co/Pt] multilayers A. BARUTH, L. YUAN, J.D. BURTON, K. JANICKA, E.Y. TSYMBAL, S.H. LIOU, S. ADENWALLA, Department of Physics and Astronomy and Nebraska Center for Materials and Nanoscience, University of Nebraska - Lincoln — Antiferromagnetically coupled magnetic thin films with perpendicular anisotropy exhibit domain overlap regions originating from magnetostatic stray fields localized in the vicinity of the domain walls. Using high resolution magnetic force microscopy we investigate these overlap regions in [Co/Pt]/NiO/[Co/Pt] multilayers as a function of the antiferromagnetic interlayer exchange coupling between the two Co/Pt stacks. Our results agree both qualitatively and quantitatively with a simple model that looks at the external fields near the domain wall regions and their magnetostatic interaction. This model gives an overlap $\delta=8M_{top}M_{bottom}t^2/J_{IEC}$, where M_{top} and M_{bottom} are the respective saturation magnetizations, t is the thickness, and J_{IEC} is the coupling strength. There is excellent quantitative agreement between the data and the model, which is substantiated by independent magnetization and thickness measurements which agree within 5% to those obtained by the 2 parameter fit. Details can be found in [1]. This research was supported by NSF (grants Nos. MRSEC DMR-0213808 and DMR-0203359). [1] A. Baruth et al. Appl. Phys. Lett. **89**, 202505 (2006).

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