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Effects of coupling on domain structure of [Pt(6Å)/Co(4Å)]$_3$/NiO(t$_{NiO}$)/[Co(4Å)/Pt(6Å)]$_3$ multilayers with oscillatory coupling[1] ANDREW BARUTH, S.H. LIOU, S. ADENWALLA, Department of Physics and Astronomy and Center for Materials Research and Analysis, University of Nebraska, Lincoln, NE 68588, D.J. KEAVNEY, Advanced Photon Source, Argonne National Laboratory, Argonne, IL 60439 — Multilayered structures of Pt(6Å)/Co(4Å)]$_3$/NiO(t$_{NiO}$)/[Co(4Å)/Pt(6 Å)]$_3$ show oscillatory exchange coupling between the two Co/Pt layers [1]. One possible mechanism for the exchange coupling may be via the propagation of canted NiO spins at the interface, an effect that can reproduce the oscillatory coupling [2] and that has been seen using X-ray Magnetic Circular Dichroism [3]. Domain images on virgin samples taken with XMCD-PEEM and MFM reveal a direct correlation between domain size and absolute coupling strength. The coupling strength was varied by changing both NiO and Pt thicknesses. MFM images show that the coupling in both FM and AFM coupled samples occurs domain by domain. FM domains form within the AFM domain wall due to a slight relative shift of the domains in the upper and lower multilayers. These FM regions contain visible stripes corresponding to opposite net magnetizations in the domain wall. [1] Phys. Rev. Lett. 91, 037207 (2003) [2] Phys. Rev. Lett. 92, 219703 (2004) [3] Phys. Rev. B 70, 224423 (2004)

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