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Magnetic coupling and training effects in Co/NiO/[Co/Pt] structures with orthogonal easy axes[1] S. ADENWALLA, A. BARUTH, Department of Physics and Astronomy and Nebraska Center for Materials and Nanoscience, University of Nebraska - Lincoln — In an attempt to broaden our understanding of the unexpected oscillatory coupling seen in perpendicularly magnetized [Co/Pt]/NiO[Co/Pt][1] samples we have investigated a series of Co/NiO/[Co/Pt] samples in which the magnetization lies in-plane and perpendicular to plane for the Co and [Co/Pt] layers respectively. Although no preferred coupling is expected, we find a coupling that depends on a variety of parameters including strength of an in-plane magnetic field pulse (the "set field"), the number of cycles (the training effect) and the NiO thickness. The strength of coupling, as measured by a shift in the Co in-plane hysteresis loop, is directly proportional to the in-plane set field, an effect of the nonzero remanence of the [Co/Pt] layer. On training, the coupling strength drops abruptly by a factor of nearly 3 on the first cycle and drops more slowly thereafter. We attribute this to the presence of domains in the [Co/Pt] layer. [1] A. Baruth et al. Phys. Rev. B **74**, 054419 (2006).

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