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Angular Dependence of Exchange Anisotropy on Cooling Field in Exchange Biased Films KAI LIU, JUSTIN OLAMIT, UC Davis Physics Department, ZHI-PAN LI, IVAN SCHULLER, UC San Diego Physics Department — Exchange anisotropy in ferromagnet/antiferromagnet (FM/AF) films is usually introduced along the cooling field or FM magnetization direction. Here we investigate the angular dependence of the exchange anisotropy on the cooling field¹ with vector magnetometry. Three types of (FM=Fe,Ni /AF = FeF₂, MnF₂) samples have been studied where the AF layer is polycrystalline, epitaxial (110) and twinned (110). With a polycrystalline AF, the exchange field direction is always the same as the cooling field. With an epitaxial AF which has one spin axis, the exchange field direction is selected by the cooling field to be along the spin axis. With a twinned AF where there are two orthogonal spin axes, the exchange field direction is always along the bisector of the spin axes that encompass the cooling field. Transverse loops show that when the exchange field has a component perpendicular to the applied field, the magnetization reversals occur by coherent rotations in the direction of the perpendicular component. Our results demonstrate systematically the dependence of the exchange field direction on the cooling field direction. ¹H. Shi and D. Lederman, Phys. Rev. B **66**, 094426 (2002). Work supported by NSF, DOE, Cal-IT² and NEAT IGERT.

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