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Domains and Magnetization Rotation in Exchange Biased Ni/FeF_2 JUSTIN OLAMIT, KAI LIU, UC Davis Physics Department, ELKE ARENHOLZ, Lawrence Berkeley National Laboratory, ZHI-PAN LI, OLEG PETRACIC, IGOR ROSHCHIN, IVAN SCHULLER, UC San Diego Physics Department — Exchange biased Ni/epitaxial-FeF_2 films have been investigated using vector coil vibrating sample magnetometry as a function of the cooling field strength H_{FC}, applied along the FeF_2 easy axis. At low H_{FC} a single longitudinal hysteresis loop is observed, negatively biased with a large exchange field. With increasing H_{FC}, the loop divides into two sub-loops shifted oppositely from zero field by the same amount. The positively biased sub-loop grows in size with H_{FC} until only a single positively shifted loop is found. Throughout this process, the negative/positive (sub)loop shift has maintained the same *discrete* value. This is in sharp contrast to films with twinned FeF_2 where the exchange field *gradually* changes from negative to positive values with increasing H_{FC}.[1] The transverse magnetization shows clear correlations with the longitudinal sub-loops. Interestingly, over 90% of the Ni reverses its magnetization by rotation, either in one step or through two successive rotations. These results are due to the single crystal nature of the antiferromagnetic FeF_2, which breaks down into two opposite regions of large domains. [1] J. Nogués, D. Lederman, T. J. Moran, and I. K. Schuller, Phys. Rev. Lett., **76**, 4624 (1996). Work supported by NSF, DOE, Cal-IT^2 and NEAT IGERT.

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