Field cooling dependence of the anisotropy in exchange biased FeF$_2$/Co films\textsuperscript{1} A.K. ALSMADI, S.G.E. TE VELTHUIS, Argonne National Laboratory, Argonne, IL, HONGTAO SHI, DAVID LEDERMAN, West Virginia University, Morgantown, WV — Using polarized neutron reflectometry we have studied the magnetization reversal in exchange biased single-crystal FeF$_2$/Co films grown on MgF$_2$. A recent study showed that the anisotropy of the antiferromagnetic FeF$_2$ plays an important role in determining the magnitude and effective direction of the exchange bias field $H_E$\textsuperscript{[1]}. After field cooling perpendicular to the c-axis (easy axis of FeF$_2$), the magnetization curve determined with the applied field parallel to the c-axis, shows a double loop, one with positive bias, and one with negative bias. This behavior suggests that the antiferromagnet is simply split into two types of domains, inducing opposite $H_E$ along the c-axis. However, our observation of spin-flip reflectivity in the field regions separating the two loops indicates that some rotation of the Co magnetization also occurs during reversal, implying that $H_E$ does not lie exclusively along the c-axis.


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