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Uncompensated Fe moments in positively exchange biased Ni/FeF₂ bilayers ELKE ARENHOLZ, LBNL, KAI LIU, University of California, Davis, CA , ZHI-PAN LI, I.K. SCHULLER, University of California San Diego, La Jolla, CA — The magnetization reversal of uncompensated Fe moments in exchange biased Ni/FeF₂ bilayers was determined using soft x-ray magnetic circular dichroism. Hysteresis loops resulting from Fe moments oriented parallel and perpendicular to the external field are almost identical to those of the ferromagnetic Ni layer. However, a small vertical loop shift indicates that some Fe moments are pinned antiparallel to small cooling fields leading to negative exchange bias but parallel to large cooling fields resulting in positive exchange bias. For intermediate cooling fields, loop bifurcation is observed. This is attributed to a coexistence of domains with uncompensated Fe moments pinned parallel and antiparallel to the cooling field. Furthermore, x-ray magnetic linear dichroism was employed to characterize the spin structure of the antiferromagnetically ordered FeF₂ but no indication for the formation of a parallel antiferromagnetic domain wall upon magnetization reversal in the ferromagnetic layer was found. The ALS at LBNL and work at UCSD are supported by DOE and work at UCD by ACS-PRF and Sloan Foundation.

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