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Exchange Bias in $Fe_xNi_{1-x}F_2$/Co Bilayers[1] MIYEON CHEON, ZHONGYUAN LIU, DAVID LEDERMAN, Multifunctional Materials Laboratory, Dept of Physics, West Virginia University — FeF_2 is an ideal antiferromagnet with a tetragonal rutile crystal structure and a strong uniaxial magnetic anisotropy along the c-axis ([001] direction). NiF_2 also shares the rutile crystal structure with similar lattice parameters, but its magnetic anisotropy causes spins to be in the $a-b$ plane, resulting in a weak ferromagnetism due to a small tilting of the antiferromagnetic sublattices. Because several theories predict that exchange bias should be a strong function of the magnetic anisotropy in the antiferromagnet, the $Fe_xNi_{1-x}F_2$/Co bilayer system provides a framework whereby this can be studied experimentally. We have grown several single-crystalline $Fe_xNi_{1-x}F_2$50 nm thick films on MgF_2 (110) substrates via molecular beam epitaxy with x varying between 0 and 1.0. We will report on the exchange bias as a function of Fe concentration in the alloy.

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