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Temperature dependence of the uncompensated magnetization in $Fe_xNi_{1-x}F_2$/Co bilayers[1] DAVID LEDERMAN, MIYEON CHEON, ZHONGYUAN LIU[2], Department of Physics, West Virginia University — A giant uncompensated magnetization in $Fe_xNi_{1-x}F_2$/Co was observed in the hysteresis loops at low temperatures ($T < T_B \sim 55$ K), whose sign was correlated with the sign of the exchange bias field H_E. In this study, the uncompensated magnetization of $x = 0.05$, 0.21 and 0.49 samples was studied at different temperatures. The uncompensated magnetization was reversed at $H = -16$ kOe ($H = -14$ kOe) going from positive to negative fields and $H = +14$ kOe ($H = +11$ kOe) going from negative to positive fields at $T = 30$ K for the $x = 0.05$ ($x = 0.21$) sample. This asymmetry in the reversal means that the uncompensated magnetization in these samples has its own exchange bias field of $H_{EU} \sim -1$ kOe with a coercivity of 14 kOe. In the case of the $x = 0.49$ sample, the uncompensated magnetization has a coercivity of 23 kOe and a positive exchange bias $H_{EU} = +10$ kOe at $T = 30$ K. The coercive fields of the uncompensated magnetization decrease as the temperature increases while the magnitude of the uncompensated magnetization remains constant.

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