

Abstract Submitted
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Exchange bias and magnetic anisotropy in ultrathin iron films grown on (001) GaAs¹ KRITSANU TIVAKORNSASITHORN, XINYU LIU, MALGORZATA DOBROWOLSKA, JACEK FURDYNA, Department of Physics, University of Notre Dame, Notre Dame, IN 46556 — Ultrathin iron films grown by MBE on GaAs substrates were studied by SQUID and by ferromagnetic resonance (FMR). Exchange bias (EB) was observed in this system at temperatures below 20 K, but disappeared at higher temperatures. The angular dependence of asymmetric hysteresis loops of the sample were understood as resulting from the coexistence of the cubic and uniaxial magnetic anisotropy fields of the Fe film and the EB field arising from a yet unidentified inter-layer between Fe and GaAs (possibly Fe₂As). Magnetic anisotropy of the Fe films was investigated by FMR in a manner similar to that described by Aktas et al. [1]. By fitting the angular dependence of the FMR field we have obtained magnetic parameters of the sample, which are similar to those reported in Ref. [1]. However, the g-factor obtained from the fitting shows an unexpected anomalous increase in the low temperature range. Since this behavior occurs exactly in the range where EB appears, it is tempting to speculate that these two effects are causally related.

[1] B. Aktas et al., J. Appl. Phys. 102, 013912 (2007).

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