Abstract Submitted
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An n-type tunable two-dimensional ferromagnetic semiconductor[1] ANGELO BOVE[2], F. ALTOMARE[3], N. KUNDTZ, A. CHANG, Physics Department, Duke University, Durham, NC 27708, Y.J. CHO, X. LIU, J. FURDYNA, Physics Department, University of Notre Dame, Notre Dame, IN 46556 — In the past two decades ferromagnetic semiconductors have been the focus of intense studies because of their potential technological application for spintronics. Particular attention has been dedicated to III-V Diluted Magnetic Semiconductors (DMS), where the ferromagnetism (FM) is hole-mediated and the Curie temperature can therefore be tuned by changing the concentration of free carriers[4]. In these structures, the Anomalous Hall Effect (AHE) has played a key role in establishing that FM is hole-mediated. We will present data that show the first evidence of electron-mediated FM in GaMnAs. Our heterostructure has a low carrier density ($\sim 1.1E12cm^{-}2$), a mobility of $\sim 600cm^2/(Vs)$ and excellent gating capabilities. We will also present data that show the first clear bound on the AHE in an electron-mediated DMS and find it much reduced in magnitude when compared to the case of hole-mediated FM.

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[4]T. Dietl *et al.*, Phys. Rev. B **63**, 195205 (2001)

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