Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Magnetic Resonances in the circular polarization of light emitted by Fe/InAs QD spin LEDs M. YASAR, S. DELIKANLI, R. MALLORY, A. PETROU, SUNY Buffalo, G. KIOSEOGLOU, A.T. HANBICKI, C.H. LI, B.T. JONKER, Naval Research Laboratory — The circular polarization P_{circ} of the light emitted from InAs QD LEDs was studied as function of applied magnetic field B in the 5-75 K temperature range. The quantum dots are incorporated at the center of a GaAs quantum well of width L_W . At$T = 5$ K we observed two distinct resonances in the P_{circ} versus B plot. For $L_W = 430$ Å the resonances occur at $B = 4.6$ T (strong) and $B = 2.3$ T (weak). The strength of the resonances depends critically on bias voltage V (very pronounced at low Vvalues) The resonances become weaker with increasing temperature and disappear completely by $T = 60$ K. No resonances were observed in LEDs in which the QDs were not incorporated in a quantum well. We propose a model that takes into account the confinement conduction subbands of the GaAs quantum well and the dependence of their energies on magnetic field.
Acknowledgements: This work is supported by the DARPA SpinS Project, ONR, and NSF

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Date submitted: 29 Nov 2005 Electronic form version 1.4