Abstract Submitted
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Spin Dynamics of InAs Quantum Dots with Uniform Height.[1] T.A. KENNEDY, J. WHITAKER[2], A.S. BRACKER, D. GAMMON, S.E. ECONOMOU, T.L. REINECKE, Naval Research Lab. — Spin splittings and relaxation times were studied by Time-Resolved Faraday Rotation (TRFR) in InAs self-assembled quantum dots. Three twenty-layer samples with different dopings were grown by the Indium-flush method. This technique produces a nearly constant dot-height of 2.5 nm. The TRFR was performed using a 1.3 ps pulse Ti:sapphire laser with the sample at 5.7 K. In the undoped and lightly doped samples, signals are observed from exitons in neutral dots and from electrons and trions in negatively charged dots. Simulations for both the neutral and charged dots account for the results very well. The in-plane electron g-factor is 0.42 and shows very little variation from sample to sample or with energy in spectral studies. We ascribe this to the fixed height of the dots. The hole g-factor can be extracted cleanly from the results for the heavily doped sample. Two of the samples exhibit mode-locking of the electrons spins at 12 ns demonstrating that T_2 is much longer than T_2*.

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