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Spin Dynamics in InAs/GaAs Quantum Structures J. WHITAKER, M. WARE, D. GAMMON, A.S. BRACKER, T.A. KENNEDY, Naval Research Laboratory — Arrays of InAs SAQD's with narrow size distributions are being developed for applications in optoelectronics and quantum information. Here we describe initial measurements of spin dynamics from a wafer with a varying dot-density. We measured T_2^* using Time Resolved Kerr Rotation (TRKR) for a wavelength resonant with the 2D InAs wetting layer in a region of the sample where the Stranski-Krastanow strain mediated quantum dots have not formed and found a g-factor of 0.42 and the lifetime to be 125 ps. We attribute this relatively short lifetime, compared to the recombination time of ~ 1 ns, to the inhomogeneity of the wetting layer. However, when performing the same measurement in a region of the sample where the dots were present the electron lifetime decreased by an order of magnitude to 12 ps. The reduction in lifetime is attributed to the exciton created in the wetting layer being captured by the dot. Weak signals were observed when resonant with the dots. Work supported in part by ONR, NSA/ARDA, and DARPA/SPINS. JW is an NRC/NRL Postdoctoral Research Associate.

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