Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Time-resolved Faraday rotation measurements of spin relaxation in InGaAs/GaAs quantum dots[1] JENNIFER ROBB, YE CHEN, ADAM TIMMONS, Dalhousie University, OLEG SHCHEKIN, DENNIS DEPPE[2], University of Texas at Austin, KIMBERLEY HALL, Dalhousie University — We report measurements of room temperature spin dynamics in InGaAs quantum dots using time-resolved differential transmission and Faraday rotation techniques. We observe an enhancement of the electron spin lifetime by an order of magnitude for direct optical pumping of the quantum dot ground state compared to optical pumping of the GaAs barriers. These findings indicate that the optical excitation conditions can have a critical influence on the spin kinetics, a result which may account for the wide variation of spin lifetimes reported to date. The observed enhancement in spin lifetime is attributed to the reduction of phonon-mediated spin-flip scattering.

[1]This research is supported by CFI and NSERC.
[2]Present Address: University of Central Florida

Jennifer Robb
Dalhousie University

Date submitted: 20 Nov 2006 Electronic form version 1.4