Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Landé g factors and orbital angular momentum quenching in semiconductor quantum dots CRAIG E. PRYOR, MICHAEL E. FLATTÉ, Phyisics Dept., University of Iowa — We present calculations of g-factors for nanocrystal and self-assembled quantum dots. We find that in addition to the effects of dot geometry and strain, quantization quenches the orbital angular momentum of the dot states, pushing the electron g factor towards 2 even when all the semiconductor constituents of the dot have negative g factors. This leads to trends in the dot's electron g factors that are the opposite of those expected from the effective g factors of the dot and barrier material. Both electron and hole g factors are strongly dependent on the magnetic field orientation; hole g factors for InAs/GaAs quatum dots have large positive values along the growth direction and small negative values in-plane. The approximate shape of a quantum dot can be determined from measurements of this g factor asymmetry. This work was supported by DARPA/ARO DAAD19-01-1-0490.

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Date submitted: 30 Nov 2004 Electronic form version 1.4