Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Exciton fine structure splitting in self-assembled semiconductor quantum dots: Intrinsic and extrinsic effects RANBER SINGH, GABRIEL BESTER, Max Planck Institute for Solid State Research — We investigate the excitonic fine structure splitting (FSS) in InGaAs/GaAs and GaAs/AlGaAs quantum dots (QDs) of different shapes and sizes using an atomistic pseudopotential approach [1,2]. We consider intrinsic effects originating from the atomistic symmetry of the structure. We highlight the effects of the growth direction and the repercussions it has on the point group symmetry and the FSS. We give predictions for the cases where the semiconductor alloy has a certain degree of atomic order, and for the case, where the QDs are influenced by charged point defects. These effects are contrasted to the extrinsic effect of applied stress.
[1] R. Singh and G. Bester, *Lower bound for the excitonic fine structure splitting in self-assembled quantum dots.* Phys. Rev. Lett. **104**, 196803 (2010).
[2] R. Singh and G. Bester, *Nanowire Quantum Dots as an Ideal Source of Entangled Photon Pairs.* Phys. Rev. Lett. **103**, 063601 (2009).

Gabriel Bester
Max Planck Institute for Solid State Research

Date submitted: 14 Nov 2011 Electronic form version 1.4