

Abstract Submitted  
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**Multiple Exciton Generation in Silicon QD arrays** ANDREI KRYJEVSKI, North Dakota State University, DMITRI KILIN, University of South Dakota — We use Density Functional Theory (DFT) combined with the many body perturbation theory to calculate multiple exciton generation (MEG) in several semiconductor nanosystems. Hydrogen-passivated  $Si_{29}H_{36}$  quantum dots (QDs) with crystalline and amorphous core structures, the quasi one dimensional (1-D) arrays constructed from these QDs, as well as crystalline and amorphous Si nanowires have been studied. Quantum efficiency, the average number of excitons created by a single photon, has been calculated in these nanoparticles to the leading order in the screened Coulomb interaction. Amorphous nanostructures are predicted to have more effective carrier multiplication.

Andrei Kryjevski  
North Dakota State University

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