

Abstract Submitted
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Characterization of MBE grown PbSe Quantum Dots NATHANIEL BECKER, DUSTIN KLEIN, TIM KIDD, Univ of Northern Iowa — Lead selenide (PbSe) has been shown to be an excellent candidate for solar cell research due to its ability to allow the possibility for multiple electronic carrier production by absorption of a single photon. These quantum dots (QDs) were created using molecular beam epitaxy (MBE) to evaporate PbSe onto clean and modified silicon and germanium substrates. Control of lattice strain was achieved by the deposition of buffer layers onto clean Si(111) in ultra-high vacuum. The MBE technique allows for structural control at the atomic level. We have investigated the samples using Auger spectroscopy, scanning probe and scanning electron microscopy to determine their suitability for solar cell applications. Specifically, we investigated structural properties such as size, distribution, and uniformity to correlate such features with the electronic properties of the sample. Our initial results indicate the structural properties can be controlled with careful tuning of the substrate surface properties.

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