Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

DC Electrical Transport Properties Of PbSe Nanocrystal Quantum Dot Solids[1] HUGO ROMERO, MARIJA DRNDIC[2], University of Pennsylvania — We have studied temperature-dependent electronic charge transport in three-dimensional, closed-packed arrays of PbSe colloidal nanocrystals in the form of thin disordered films. PbSe nanocrystal quantum dots offer unique access to the regime of extreme quantum confinement because of the large Bohr radii of electrons and holes. These materials are expected to have significantly different physical properties from those of the better-known II-VI (CdSe) nanocrystals. Current-voltage characteristics of PbSe nanocrystal arrays show a variety of phenomena, which can be well described using the framework established in the context of transport measurements in metallic quantum dots.

[1]Supported by the ONR Young Investigator Award N000140410489, the American Chemical Society (ACS) PRF award # 41256-G10, and the startup funds at the University of Pennsylvania
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Date submitted: 27 Mar 2013 Electronic form version 1.4