Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Time resolved photoluminescence study of CdSe/CdMnS/CdS core/shell/shell nanoplatelets heterostructures[1] THOMAS SCRACE, State Univ of NY - Buffalo, SAVAS DELIKANLI, MEHMET ZAFER AKGUL, Bilkent University, JOSEPH MURPHY, TIM THOMAY, PEIYAO ZHANG, TENZIN NORDEN, ALEXANDER CARTWRIGHT, ATHOS PETROU, State Univ of NY - Buffalo, HILMI VOLKAN DEMIR, Bilkent University — We have recorded the time evolution of the photoluminescence (PL) for CdSe/CdMnS/CdS core/shell/shell solution-processed nanoplatelets (NP) using ultrafast pulses at 400 nm and 514 nm. Our NPs consist of a core with 5 monolayers (1.5 nm) of CdSe and average lateral dimensions of 55 x 10 nm^2. Using 400 nm pulses we excite electron-hole pairs above the CdS shell bandgap; with 514 nm pulses we excite only in the CdSe core. The holes are primarily localized in the CdSe core, while the electrons are delocalized. Our measurements show that at Δt =0, the peak PL energy for both kind of excitations is the same. As a function of time, both types of excitations result in a red-shift. The red shift of with 400 nm excitation is 60 meV and is described by two time scales: τ_1 =270 ps and τ_2 =2.5 ns. The red shift with the 514 nm excitation is 30 meV and is described by a single time scale: $\tau_2^{'}$ =2.5 ns. These results are discussed in terms of dipole layer formation[1]. [1] Gu, Y et. al. Phys. Rev. B 71 045340 (2005).

[1]H.V.D. is supported by EU-FP7 Nanophotonics4Energy NoE, and TUBITAK EEEAG 109E002, 109E004, NRF-RF-2009-09, NRF-CRP-6-2010-02 and A*STAR of Singapore. A.P. is supported by NSF DMR 1305770

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Date submitted: 06 Nov 2015 Electronic form version 1.4