Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Understanding exciton dynamics in layered 2D organic-inorganic hybrid perovskites[1] ERIC AMERLING, SANGITA' BANIYA, EVAN LAFALCE, CHARLIE ZHANG, ZEEV VALY VARDENY, LUISA WHITTAKER-BROOKS, Univ of Utah — 2D organic-inorganic hybrid perovskite multiple quantum wells which consist of multilayers of alternate organic and inorganic layers exhibit large exciton binding energies ($\approx$ 0.3 eV) due to the dielectric confinement between the inorganic and organic layers, as well as multiexciton resonances. Such large exciton binding energies lead to huge exciton oscillation strength with Rabi frequency of the order of 50 meV. We have investigated the exciton dynamics of 2D butylammonium lead iodide, $(CH_3(CH_2)_3NH_3)_2PbI_4$, via photoluminescense (PL) in the temperature range of 300 K to 10 K and electroabsorption (EA) spectroscopy at RT and 40K. A blue shift of the PL emission spectrum and the evolution of an additional emission peak suggest that this compound undergoes a phase transition at $\approx$160 K. The EA spectroscopy has allowed us to determine the exciton transitions and binding energies in the two structural phases more precisely than from the PL and absorption spectra.

[1]*This work was supported by the DOE grant DE-SC0014579.

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Date submitted: 13 Nov 2016 Electronic form version 1.4