Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Millikelvin magneto-photoluminescence of isoelectronic bound excitons in type-II quantum dot superlattices IGOR KUSKOVSKY, HAO-JIE JI, SIDDHARTH DHOMKAR, Queens College and Graduate Center of CUNY, New York, NY, JONATHAN LUDWIG, DMITRY SMIRNOV, NHMFL and FSU, Tallahassee, FL, MARIA TAMARGO, City College and Graduate Center of CUNY, New York, NY — Photoluminescence (PL) spectrum of Zn-Se-Te multilayer system grown via migration enhanced epitaxy with submonolayer insertion of Te, has been reported to demonstrate coexistence of the isoelectronic centers along with the type-II quantum dots (Gu, *et al.*, Phys. Rev. B **71**, 045340 (2005)). Spectrally, the band edge emission, originating from the isoelectronic bound excitons (IBE), is observed as characteristic 'sharp lines' and their phonon replicas, whereas the low energy side is dominated by spatially indirect, type-II excitons. The latter exhibit robust Aharanov-Bohm oscillations in the intensity of the magneto-PL up to 30 K, while no such effect was expected for the IBEs. Here we report a high resolution spectral analysis of the magneto-PL spectra of various samples with relatively low Te content measured at millikelvin temperatures. The analysis reveals additional features in magneto-PL intensity at specific magnetic fields that appear only in the spectral region dominated by the 'sharp lines'. Although the precise origin of these distinctive peaks is still unknown, they are thought to be arising due to 2-dimensional confinement of IBEs. Supported by the National Science Foundation under Award No. DMR-1006050

Igor Kuskovsky
Queens College and Graduate Center of CUNY, New York, NY

Date submitted: 15 Nov 2013 Electronic form version 1.4