

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Robust Aharonov-Bohm oscillations at elevated temperatures in type-II ZnTe/ZnSe quantum dots¹ V.R. WHITESIDE, I.R. SELLERS, University at Buffalo, I.L. KUSKOVSKY, Queens College CUNY, A.O. GOVOROV, Ohio University, B.D. MCCOMBE, University at Buffalo — The Zn(Te)Se material system is remarkable in that it is possible to study both Te-bound isoelectronic excitons and type-II ZnTe quantum dots (QDs) in the same sample. This is possible since with increasing tellurium deposition there is a clustering of the Te-atoms resulting in an evolution of Te isoelectronic centers, formed by Te-Se substitution, into ZnTe QD structures. The formation of columns of such QDs in multilayer superlattice structures has recently been shown to be particularly suitable for the observation of the optical Aharonov-Bohm effect. Here we present magneto-photoluminescence from such type-II ZnTe/ZnSe QDs that demonstrate large and persistent oscillations in *both* the exciton energy *and* intensity at high temperature indicating the formation of coherently rotating states. Furthermore, this high temperature Aharonov-Bohm effect is remarkably robust persisting until 180K despite significant quenching of the luminescence due to ionization of the type-II excitons.

¹This work is supported in part by CSEQuin (UB) and DOE #DEFG02-05ER46219.

I.R. Sellers
University at Buffalo

Date submitted: 05 Dec 2007

Electronic form version 1.4