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Exciton Localization in $\text{ZnSe}_{1-x}\text{O}_x$ R. BROESLER, E. HALLER, Materials Science and Engineering, U. C., Berkeley; Materials Sciences Division, L. Berkeley National Lab, W. WALUKIEWICZ, Materials Sciences Division, L. Berkeley National Lab, Y. NABETANI, Electrical Engineering, University of Yamanashi — We have studied the relative magnitude of the localized density of states in $\text{ZnSe}_{1-x}\text{O}_x$ ($0 < x < 0.063$) through modeling of the temperature dependence of the photoluminescence (PL) and time-resolved PL at 15K. Alloying a small amount of ZnO with ZnSe results in a large decrease of the band gap from a downward shift of the conduction band. The random distribution of oxygen in the lattice results in local fluctuations of the conduction band edge, which form tails of localized states that localized excitons. This results in an anomalous blue shift of the PL emission with increasing temperature and a strong emission energy dependence to the PL decay time.

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