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Magneto-PL Measurements of (Zn,Mn)Se Nanowires and Residual Nanostructures B. J. COOLEY, N. SAMARTH, Dept. of Physics, Penn State University, University Park PA 16802, S. A. CROOKER, H. HTOON, Los Alamos National Lab, Los Alamos, NM 87545 — Magnetic semiconductor nanowires (NWs) potentially provide model systems for studying spin polarized 1D Fermi liquids [Nano Letters **9**, 3142 (2009)]. Here, we report low temperature magneto-photoluminescence measurements of (Zn,Mn)Se NWs grown using a two-stage vapor-liquid-solid process [e.g. Appl. Phys. Lett **93**, 143106 (2008)] that yields defect-free NWs in the 1D regime. Far-field photoluminescence (PL) measurements of as-grown samples show near band edge emission as well as a broad defect band convolved with Mn emission. In a magnetic field, we observe significant Zeeman shifts in the band edge luminescence at low temperatures, indicating the presence of strong sp-d exchange. Micro-PL measurements of as-grown samples and dispersed NWs map out the magnetic field variation of spatially resolved spectra at submicron length scales, revealing spatially localized emitters with both spectrally sharp features near the band edge as well as broad defect PL. We observe blinking and spectral diffusion in the sharper spectral features. We attribute the observed PL spectra to both (Zn,Mn)Se NWs and residual (Zn,Mn)Se nano-crystallites nucleated during the NW growth process. Supported by NSF.

Nitin Samarth
Dept. of Physics, Penn State University, University Park PA 16802

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