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Modeling of magnetic polaron properties in (Zn,Mn)Te quantum dots[1] JAMES PIENTKA, St. Bonaventure University, B. BARMAN, L. SCHWEIDENBACK, A.H. RUSS, Y. TSAI, J.R. MURPHY, A.N. CARTWRIGHT, I. ZUTIC, B.D. MCCOMBE, A. PETROU, SUNY Buffalo, W-C. CHOU, W. C. FAN, National Chiao Tung University, I.R. SELLERS, University of Oklahoma, A.G. PETUKHOV, R. OSZWALDOWSKI, South Dakota School of Mines and Technology — Magnetic polarons in (Zn,Mn)Te quantum dots (QD) show unconventional behavior [1]. These structures exhibit a small red shift of the photoluminescence peak energy in the presence of a magnetic field B and they also have a weak dependence of the polaron energy E_{MP} on temperature T and B. We attribute these properties to a large molecular field B_m that is proportional to the heavy holes spin density [2]. We have calculated B_m using the QD diameter and height as adjustable parameters. Assuming hole localization, this calculation yields values of $B_m >20$ T. The assumption that the hole localization diameter can be smaller than the QD diameter is justified due to alloy and spin disorder scattering [3]. Using the magnetic polaron free energy, we calculate E_{MP} as function of T and B for a variety of B_m values. To get a weak dependence of E_{MP} on T and Bwe must assume that the polaron temperature is higher than T. [1] B. Barman et al., Phys. Rev. B **92**, 035430 (2015). [2] J. M. Pientka et al., Phys. Rev. B **92**, 155402 (2015). [3] K. V. Kavokin et al., Phys. Rev. B **60**, 16499 (1999).

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