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Photoluminescence studies of various magnetic phases in (Zn,Mn)Te/ZnSe ODs^{\perp} JOSEPH MURPHY, LARS SCHWEIDENBACK, BIPLOB BARMAN, RAFAL OSZWALDOWSKI, ALEXANDER CARTWRIGHT, BRUCE MCCOMBE, ATHOS PETROU, IGOR ZUTIC, SUNY at Buffalo, Buffalo, NY, IAN SELLERS, University of Oklahoma, Norman, OK, WEN CHUNG CHOU, WU-CHING FAN, National Chiao Tung University, Hsinchu, Taiwan — We have carried out a magneto-PL study of a single layer of (Zn,Mn)Te/ZnSe quantum dots. The CW PL from a previously studied 5 layer sample exhibits high circular polarization but very small Zeeman splitting. Time-resolved PL exhibited a temperature independent temporal red shift, associated with the magnetic polaron formation. These data have been interpreted as due to the presence of a antiferromagnetic phase for the Mn ions. In the present study, the CW magneto-PL spectra exhibit high circular polarization, but significantly larger Zeeman splittings. Furthermore the Zeeman splitting depends strongly on temperature and vanishes at 50 K. These results indicate the presence of a different magnetic phase for the Mn ions in the single layer QD sample. Time-resolved PL experiments suggest the formation of magnetic polarons in this sample.

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