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Tuning the spin properties of excitons in CdTe/ZnTe self-assembled quantum dots KAPILA P. HEWAPARAKRAMA, SEBASTIAN MACKOWSKI, HOWARD E. JACKSON, LEIGH M. SMITH, University of Cincinnati, GRZEGORZ KARCZEWSKI, JACEK KOSSUT, Institute of Physics PAS, Warsaw, Poland, WOLFGANG HEISS, Linz University, Linz, Austria — With annealing, CdTe/ZnTe self-assembled QDs become larger through Zn and Cd interdiffusion at the dot-barrier interface. Here we determine the exchange splitting, diamagnetic shift and exciton g-factor through imaging hundreds of single CdTe QDs in the as-grown and annealed QD samples using a solid immersion lens and slit-confocal microscopy. An analysis of the polarized QD emission in external magnetic field demonstrates that annealing strongly affects the spin properties of the QD excitons. First, we find that the statistical distribution of the exchange splitting at B=0 T is more than two times narrower for the annealed QD sample. In applied magnetic field we observe a reduction of the average exciton g-factor upon annealing, which is accompanied with a substantial increase of the diamagnetic shift. These results show a way to tune the spin properties of excitons in self-assembled QDs. The work was supported by NSF grants nr 9975655 and 0071797 and PBZ-KBN-044/P03/2001.

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