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**Spin memory effect in single magnetic quantum dots** TAK GURUNG, SEBASTIAN MACKOWSKI, HOWARD E. JACKSON, LEIGH M. SMITH, University of Cincinnati, JACEK KOSSUT, GRZEGORZ KARCZEWSKI, Institute of Physics PAS, Warsaw, Poland — We image zero-field spin polarization of single CdMnTe quantum dots (QDs) using a slit-confocal microscopy and a solid immersion lens. For non-resonant excitation, where excitons randomize their spins before being captured by QDs, both $\sigma^+$ and $\sigma^-$ - polarized PL emission lines are observed. This strongly (>25%) polarized emission implies a preferred direction of spin alignment of magnetic impurities in single QDs, and thus a preferred orientation of exciton magnetic polarons (EMPs). Since the single dot emission lines include accumulation of $\sim 10^4$ photons this magnetization must persist through many recombination events. Therefore, we conclude that the EMP formed in a QD by a subsequent exciton often follows the spin alignment of the EMP formed through the previous exciton occupation. We attribute the zero-field spin memory effect observed for single CdMnTe QDs to the decay time of the Mn magnetization being significantly longer than the time intervals between consecutive exciton occupations. The work was supported by NSF grants nr 9975655 and 0071797 and PBZ-KBN-044/P03/2001.

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