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Abstract for an Invited Paper
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Control and manipulation of charge and spin in single and coupled quantum dots

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I will discuss measurements of the spin lifetime in self-assembled InGaAs dots in GaAs. The spin relaxation time (T_1) is found to be extremely long (e.g. $>25\text{ms}$ at $T=1\text{K}$, $B=4\text{T}$) decreasing with magnetic field according roughly to a clear B^{-4} power law [1]. Furthermore, T_1 is found to reduce linearly with lattice temperature and be very strongly sensitive to the motional quantisation (s-p shell splitting). Another topic is the the coherent quantum coupling of a vertically stacked pair of quantum dots. The interaction can be tuned in such quantum dot molecule devices using an applied voltage as external parameter [2]. At the resonance the electron component of the exciton wave function hybridizes, giving rise to a quantum coupling energy in the excitonic spectrum. This work is supported financially by Deutsche Forschungsgemeinschaft via collaborative research center 631 and by German Federal Ministry of Research via NanoQuit. [1] M. Kroutvar, Y. Ducommun, D. Heiss, D. Schuh, M. Bichler, G. Abstreiter and J. J. Finley. Nature **432**, 81 (2004) [2] H. J. Krenner, E. C. Clark, A. Kress, D. Schuh, M. Bichler, G. Abstreiter and J.J. Finley. PRL **94**, 057402 (2005)