

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Gate-controlled spin-splitting in quantum dots with ferromagnetic leads in the Kondo regime JAN MARTINEK, Universitaet Karlsruhe, MICHAEL SINDEL, LMU Muenchen, LASZLO BORDA, LMU Muenchen, JOZEF BARNAS, Adam Mickiewicz University, Poznan, RALF BULLA, Universitaet Augsburg, JUERGEN KOENIG, Ruhr-Universitaet Bochum, GERD SCHOEN, Universitaet Karlsruhe, S. MAEKAWA, Tohoku University, Sendai, JAN VON DELFT, LMU Muenchen — The effect of a gate voltage on the spin-splitting of an electronic level in a quantum dot (QD) attached to ferromagnetic leads is studied in the Kondo regime using a generalized numerical renormalization group (NRG) technique. We find that the gate-voltage dependence of the QD level spin-splitting strongly depends on the shape of the density of states (DOS). For one class of DOS shapes there is nearly no gate-voltage dependence, for another, the gate voltage can be used to control the magnitude and sign of the spin-splitting, which can be interpreted as a local exchange magnetic field. We find that the spin-splitting acquires a new type of logarithmic divergence. We give an analytical explanation for our numerical results and explain how they arise due to spin-dependent charge fluctuations.

Jan von Delft
LMU München

Date submitted: 07 Dec 2004

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