



Kolloquium

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Read-out, relaxation and decoherence of electron spins in a quantum dot

We have demonstrated two different techniques for single-shot measurement of the state of an individual electron spin in a semiconductor quantum dot. The measurement is done all-electrically, and presently achieves fidelities up to ~90%. Using this readout technique, we have measured the relaxation time, T_1 , between electron spin states, finding very long T_1 's, of order 1 ms. Furthermore, we have probed the effect of nuclear spins in the semiconductor material on the electron spin state, and find the electron experiences a hyperfine field of about 1 mT. We can suppress its effect by applying a small external magnetic field or by increasing the interdot tunnel coupling.

Wann? Donnerstag, 20.10.2005, 17:15 Uhr

Wo? MPI-FKF Stuttgart, Raum 4D2