

PROBING NUCLEAR SPINS IN DOUBLE QUANTUM DOTS

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When electrons are confined to small semiconductor quantum dots, they interact strongly via hyperfine interactions with lattice nuclear spins. We discuss how quantum control techniques, applied to the electronic degrees of freedom, allow for probing and manipulation of the nuclear spin degrees of freedom. Recent progress towards decoupling of electronic dynamics from nuclei as well as approaches for creating and probing non-equilibrium many-body states of nuclear spins will be presented.