

Abstract Submitted
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Spin-Dependent Scattering off Neutral Donors in Silicon Field-Effect Transistors¹ C.C. LO, J. BOKOR, University of California, Berkeley, T. SCHENKEL, Lawrence Berkeley National Laboratory, J. HE, A.M. TYRYSHKIN, S.A. LYON, Princeton University — One promising route towards single donor spin readout for donor qubits in silicon is by detecting spin-dependent scattering of conduction electrons by the neutral donors. We use accumulation-mode field-effect transistors formed in isotopically enriched silicon to study this effect. Only small ensembles of donor spins are present in our devices, ruling out bolometric effects caused by bulk donors. Spin-dependent scattering was detected using electrically detected magnetic resonance (EDMR) where spectra show resonant changes in the source-drain voltage for conduction electrons and electrons bound to donors. The utilization of spin-dependent scattering for the readout of donor spin-states in silicon based quantum computers will be discussed.

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