

Abstract Submitted
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Single Electron Spin Resonance in a Si-MOS Double Quantum Dot¹ XIAOJIE HAO, MING XIAO, HONGWEN JIANG, Department of Physics and Astronomy, University of California at Los Angeles, RUSKO RUSKOV, CHARLES TAHAN, Laboratory for Physical Sciences, USA — Pauli spin blockade is used as a means to detect the flip of spins in a silicon metal-oxide-semiconductor (MOS) based double quantum dot. Microwave driven electron spin resonance (ESR) signals, with a linewidth as narrow as 1.5 G, has been observed only in a narrow range of magnetic fields. ESR spectroscopy in the magnetic field - microwave frequency plane shows an unexpected level anti-crossing, with an energy gap of about 50 MHz. The spectral line gives an estimation of the lower bound for inhomogeneous phase decoherence time T_2^* of about a couple of hundred ns for individual spins in the nano-structured system with a Si/SiO₂ interface. We explain the anti-crossing gap as due to spin-orbit mixing with higher states, which is also responsible for the narrow-window visibility of the ESR signal in Si based double quantum dots.

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