

Single Triplet Spin Qubits in the Rotating Frame

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Electron spins in semiconductors holds promise for encoding and manipulating quantum information. The weak coupling of the spin degree of freedom to its environment provides spin qubits exceedingly long storage times. However, while storage is in the spin degrees of freedom, controlling spin qubits often involves manipulating the charge degree of freedom of the participating electrons which is far more susceptible to decoherence due to charge noise. In this talk I will discuss the advantages of operating a two electron singlet-triplet qubit in the rotating frame as a way to mitigate some of the unwanted effects of charge noise. We will demonstrate a new readout scheme for these qubits which is needed for operating in the rotating frame as well as full single and two qubit process tomography demonstrating two qubit gate fidelity in excess of 0.9.