

Name: Noah Tobias (Toby) Jacobson

Title: Distinguishing adiabaticity from relaxation in a silicon double quantum dot charge qubit

Abstract: Though semiconductor charge qubits have coherence times too brief for them to hold promise as components of a circuit model quantum computing architecture, at Sandia we're investigating the utility of charge qubits for adiabatic quantum computation. In this talk I will provide an overview of the qubit-environment interactions experienced by these devices and will describe the experimental and theoretical work we have performed that probes the energy dependence of the relaxation rate in a silicon charge DQD. Finally, I will outline an experiment we propose that may distinguish whether the ground state population of this single-qubit device is driven by relaxation or adiabaticity.

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