

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Gate Capacitance Reproducibility and Modeling in Silicon Double Quantum Dots TED THORBECK, JQI: NIST & U. of Maryland, AKIRA FUJIWARA, NEIL ZIMMERMAN, NTT — For many applications the ability to design quantum dots with a specific set of gate capacitances and then rely on the reproducibility of those capacitances is crucial. For quantum computing, the ability to design our gate capacitances would help in reaching the few electron regime and in coupling multiple devices. For other applications the ability to design our gate capacitances would enable higher temperature operation. Our double quantum dots are formed by electrostatic gates on a silicon nanowire. We have measured 20 similar devices with 8 different sets of lithographic parameters. We will report on the reproducibility of the gate capacitances. For example, the range of capacitances is typically within 10% of the average. We will also compare our measured capacitances to simulations based on lithographic parameter. This simulation could then be used to design new devices.

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Date submitted: 01 Dec 2010

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