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Low Disorder Si MOSFET Dots for Quantum Computing E.P. NORDBERG, University of Wisconsin - Madison and Sandia National Laboratories, L.A. TRACY, G.A. TEN EYCK, K. ENG, H.L. STALFORD, K.D. CHILDS, J. STEVENS, R.K. GRUBBS, M.P. LILLY, Sandia National Laboratories, M.A. ERIKSSON, University of Wisconsin - Madison, M.S. CARROLL, Sandia National Laboratories — Silicon quantum dot based qubits have emerged as an appealing approach to extending the success of GaAs spin based double quantum dot qubits. Research in this field is motivated by the promise of long spin coherence times, and within a MOS system the potential for variable carrier density, very small dot sizes, and CMOS compatibility. In this work, we will present results on the fabrication and transport properties of quantum dots in novel double gated Si MOS structures. Coulomb blockade is observed from single quantum dots with extracted charging energies up to an including 5meV. Observed dots were formed both from disorder within a quantum point contact, and through disorder free electrostatic confinement. Extracted capacitances, verified with 3D finite element simulations confirm the location of the disorder free dot to be within the designed lithographic structure. Distinctions will be made regarding the effects of feature sizes and sample processing. Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Eric Nordberg
University of Wisconsin - Madison and Sandia National Laboratories

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