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Coulomb Blockade in Double Top Gated Si MOS Nano-Structures ERIC NORDBERG, University of Wisconsin - Madison and Sandia National Laboratories, MALCOLM CARROLL, MIKE LILLY, KENT CHILDS, LISA TRACY, KEVIN ENG, ROBERT GRUBBS, JOEL WENDT, JEFF STEVENS, Sandia National Laboratories, MARK ERIKSSON, University of Wisconsin - Madison — Recent demonstrations of Pauli blockaded transport in Si-based double quantum dots [1,2] have demonstrated that the basic processes involved in spin-to-charge conversion are observable in gated quantum dots in Si. In this work, we will present results on the fabrication and electrical transport properties of novel double top gated Si MOS nano-structures. Potential advantages include: variable 2DEG density, CMOS compatible processes, and relatively small vertical length scales. A silicon foundry was used for initial processing steps and produced MOS structures with a peak mobility of 12000 cm sq/V-s at electron densities of 1e12/cmˆ2. Resulting structures, demonstrate Coulomb blockade, and we will discuss the effect of different geometries (vertical top gate spacing, and single and double dot designs) on Coulomb blockade in these Si MOS structures. 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. (1) Nakul Shaji et. al. arXiv:0708.0794v1 (2) H. W. Liu et. al. arXiv:0707.3513v1

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