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Fabrication and measurement of quantum dots in double gated, dopantless Si/SiGe heterostructures DANIEL WARD, ROBERT MOHR, JONATHAN PRANCE, JOHN GAMBLE, DON SAVAGE, MAX LAGALLY, SUSAN COPPERSMITH, MARK ERIKSSON, University of Wisconsin-Madison — Significant progress has been made towards quantum dot spin qubits in Si/SiGe single and double quantum dots. In the past, these structures have been created by depleting a modulation-doped 2DEG that forms at the Si/SiGe interface. The modulation doping in such devices is believed to be a source of charge noise. Recently, undoped structures have been explored for the formation of both 2DEGs and quantum dots in Si/SiGe. Here we discuss measurements on double gated, dopantless quantum dots in Si/SiGe heterostructures. The devices are based on a new "island mesa" design incorporating micro-ohmic contacts. We present transport measurements on a double quantum dot showing a smooth transition from single dot to double dot behavior.

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