

Abstract Submitted  
for the MAR16 Meeting of  
The American Physical Society

**Joint measurement of electron spin qubits via proximal conductance**<sup>1</sup> JASON KESTNER, Department of Physics, UMBC — We propose a method to carry out joint measurements on spin qubits that are separated by several microns. Joint measurements, which reveal multi-qubit properties without determining anything about the individual qubits, are a key ingredient to performing quantum error correction and to producing measurement-based entanglement of non-interacting qubits. We presume that the qubits are capacitively coupled to a common conductance channel and are separated by a distance less than the phase coherence length of the semiconductor, and we calculate the tolerance of the procedure to various experimental imperfections. Conditions for carrying out  $N$ -qubit syndrome measurements are discussed.

<sup>1</sup>Support provided by UMBC Office of Research through an SRAIS award.

Jason Kestner  
Department of Physics, UMBC

Date submitted: 06 Nov 2015

Electronic form version 1.4