Abstract Submitted
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High fidelity gates for exchange-only qubits in triple-quantum-dots[1] JIANJIA FEI, University of Wisconsin - Madison, JO-TZU HUNG, University at Buffalo, State University of New York, TECK SENG KOH, YUN-PIL SHIM, University of Wisconsin - Madison, SANGCHUL OH, University at Buffalo, State University of New York, SUSAN COPPERSMITH, University of Wisconsin - Madison, XUEDONG HU, University at Buffalo, State University of New York, MARK FRIESEN, University of Wisconsin - Madison — One of the main attractions of implementing exchange-only qubits in quantum dots is their ease of control. Gate operations are performed by changing the voltages on the top-gates, to vary the tunnel coupling and/or the detuning between the dots. One of the main challenges is that when exchange interactions are turned on, charge noise will cause dephasing. Here, we explore optimal strategies for implementing logical qubit rotations in exchange-only qubits. We take into account charge noise, and challenges due to hyperfine interactions, including leakage outside the logical qubit space, and dephasing caused by fluctuations of the local nuclear fields. Our method is based on optimizing the experimentally tunable parameters to maximize the fidelity of the gate operation. /newline /newline The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the official policies, either expressly or implied, of the U.S. Government.

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