Abstract Submitted
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Implementing a C_kNOT gate using Rydberg blockade[1] LARRY ISENHOWER, MARK SAFFMAN, University of Wisconsin — Multibit quantum gates are efficient primitives for quantum error correction and other algorithms. We report on an analysis of the fidelity and error scaling of a C_kNOT gate (CNOT gate with k control bits) using Rydberg blockade. Provided all $k+1$ bits lie within a blockade radius the gate can be implemented using a sequence of $2k+1$ Rydberg pulses. This is a more efficient scaling than would be obtained by decomposing the C_kNOT into one and two- qubit gates.

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