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Composite multi-qubit gates dynamically corrected against charge noise and magnetic field noise for singlet-triplet qubits[1] JASON KESTNER, Department of Physics, University of Maryland, Baltimore County, and Condensed Matter Theory Center, University of Maryland, College Park, EDWIN BARNES, XIN WANG, Condensed Matter Theory Center, University of Maryland, College Park, LEV BISHOP, SANKAR DAS SARMA, Condensed Matter Theory Center and Joint Quantum Institute, University of Maryland, College Park — We use previously described single-qubit SUPCODE pulses on both intra-qubit and inter-qubit exchange couplings, integrated with existing strategies such as BB1, to theoretically construct a CNOT gate that is robust against both charge noise and magnetic field gradient fluctuations. We show how this allows scalable, high-fidelity implementation of arbitrary multi-qubit operations using singlet-triplet spin qubits in the presence of experimentally realistic noise.

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