Abstract Submitted
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Composite pulses robust against charge noise and magnetic field noise for universal control of a singlet-triplet qubit[1] XIN WANG, EDWIN BARNES, Condensed Matter Theory Center, University of Maryland, College Park, JASON P. KESTNER, Department of Physics, University of Maryland, Baltimore County and Condensed Matter Theory Center, University of Maryland, College Park, LEV S. BISHOP, SANKAR DAS SARMA, Condensed Matter Theory Center and Joint Quantum Institute, University of Maryland, College Park — We generalize our SUPCODE pulse sequences [1] for singlet-triplet qubits to correct errors from imperfect control. This yields gates that are simultaneously corrected for both charge noise and magnetic field gradient fluctuations, addressing the two dominant T_2^* processes. By using this more efficient version of SUPCODE, we are able to introduce this capability while also substantially reducing the overall pulse time compared to the previous sequence. We show that our sequence remains realistic under experimental constraints such as finite bandwidth. [1] Wang et al., "Composite pulses for robust universal control of singlet-triplet qubits", Nat. Commun. 3, 997 (2012)

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