

Abstract Submitted
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Charge noise in quantum dot qubits: beyond the Markovian approximation.¹ YUAN-CHI YANG, MARK FRIESEN, S. N. COPPERSMITH, Univ of Wisconsin, Madison — Charge noise is a limiting factor in the performance of semiconductor quantum dot qubits, including both spin and charge qubits. In this work, we develop an analytical formalism for treating semiclassical noise beyond the Markovian approximation, which allows us to investigate noise models relevant for quantum dots, such as $1/f$ noise. We apply our methods to both charge qubits and quantum dot hybrid qubits, and study the effects of charge noise on single-qubit rotations in these systems. The formalism is also directly applicable to the case of strong microwave driving, for which the rotating wave approximation breaks down.

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