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Effect of Charge Noise on Landau-Zener Interferometry in double quantum dots ZHENYI QI, MARK FRIESEN, SUSAN COPPERSMITH, MAXIM VAVILOV, Univ of Wisconsin, Madison — We study the effect of charge noise on the dynamics of semiconductor quantum dot qubits. Recent experiments have demonstrated relatively long coherence times in these systems; however at the same time, the visibility of the Landau-Zener interference pattern is relatively low. We argue that the electromagnetic noise of the environment affects the coherence of the qubit near the charge degeneracy point, including the singlet-triplet avoided level crossing, and results in the reduced visibility of the Landau-Zener interferometry when the singlet-triplet avoided level crossing happens in the vicinity of the charge degeneracy point. Using a master equation, we describe the evolution of the density matrix for the qubit assuming weak coupling of the quantum dot to its electromagnetic environment and compare our results to experimental data.

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