

Abstract Submitted
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Two-electron spin relaxation in a double quantum dot¹ CHIA-WEI HUANG, MASSOUD BORHANI, XUEDONG HU, Department of Physics, University at Buffalo, the State University of New York — Motivated by recent experiments done on GaAs gate-defined double quantum dots (DQD)², we study the two-electron spin relaxation in DQD at various energy detuning ε and magnetic fields. In particular, we focus on two limits of interdot energy detuning. For $\varepsilon > 0$, we investigate the spin blockade by evaluating the electron spin relaxation rate from low energy (1,1) triplet states to the ground (0,2) singlet state. For $\varepsilon < 0$, we calculate the electron spin relaxation time at the S(1,1)-T₀ degeneracy to identify the leakage of an ST₀ qubit. Particularly, we explore the relaxation channel due to the hyperfine interaction and the electron-phonon interaction.

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²J. R. Petta, *et al.* Science 309,2180(2005)

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