

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Dephasing of exchange coupled spin qubits by electron-phonon coupling in Silicon¹ XUEDONG HU, University at Buffalo, The State University of New York — Silicon is regarded as one of the most promising host materials for solid state spin-based quantum information processing because of small spin-orbit interaction and the prospect of removing nuclear spins through isotopic purification. However, in a coupled spin system, charge and orbital fluctuations are as harmful to the spin qubits as in other semiconducting materials. Here we explore pure dephasing between the two-electron singlet and triplet states for two exchange-coupled spin qubits in a double quantum dot, with particular attention paid to the multi-valley nature of the silicon conduction band.

¹This work is supported by NSA, LPS, ARO, and NSF.

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Date submitted: 26 Nov 2007

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