

Abstract Submitted  
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**Role of Nuclear Quadrupole Coupling on Decoherence and Relaxation of Central Spins in Quantum Dots** NIKOLAI SINITSYN, Theoretical Division, Los Alamos National Laboratory, YAN LI, SCOTT CROOKER, National High Magnetic Field Laboratory, LANL, AVADH SAXENA, DARRYL SMITH, Theoretical Division, Los Alamos National Laboratory, SPIN NOISE SPECTROSCOPY TEAM — Strain-induced gradients of local electric fields in semiconductor quantum dots can couple to the quadrupole moments of nuclear spins. We develop a theory describing the influence of this quadrupolar coupling on the spin correlators of electron and hole “central” spins localized in such dots. We show that when the QC strength is comparable to or larger than the hyperfine coupling strength between nuclei and the central spin, the relaxation rate of the central spin is strongly enhanced and can be exponential. We demonstrate a good agreement with our recent experiments on spin noise measurements in hole-doped (In,Ga)As self-assembled quantum dots.

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