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Real-time decoherence of hyperfine-coupled electrons in quantum dots JORDAN KYRIAKIDIS, JEAN-MARC SAMSON, Dalhousie University, Halifax, Canada — We approach the study of the electron spin decoherence due to the Fermi contact hyperfine interaction with the density matrix formalism of quantum relaxation. We consider an s-type electron in the ground state of a quantum dot interacting with a thermal distribution of nuclear spins. We directly compute the time dependence of the reduced density matrix by solving the system of integro-differential equations resulting from the Liouville equation at the Born (but not Markov) approximation. We show how the spin precession can, under certain circumstances, slow down and even reverse its rotation sense.

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