

Abstract Submitted
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Quantum-limited measurement and gates on spin qubits via curvature coupling to cavity RUSKO RUSKOV, CHARLES TAHAN, Laboratory for Physical Sciences, College Park, MD 20740, U.S.A. — We have studied the possibility of a coupling of encoded quantum dot spin-qubit to a microwave resonator via the qubit energy level curvature and gate voltage variation (both quantum and classical). A coupling strength of tens of MHz can be achieved both with/without external voltage modulation, while minimizing charge dephasing and avoiding enhanced decoherence (Purcell) effect. We investigated specific procedures for selective qubit(s) readout, switching on/off the coupling, with the prospect for quantum-limited qubit(s) measurement for generating qubit entanglement. Implications of the curvature couplings for geometric quantum gates on spin qubits are also considered.

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