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Coupling an electron spin to a cavity[1] XUEDONG HU, University at Buffalo, SUNY, YUXI LIU, Tsinghua University, FRANCO NORI, Riken and University of Michigan — We investigate coupling an electron spin in a semiconductor quantum dot to a cavity via the electrically driven spin resonance technique. Spin degree of freedom is accessed here through either spin-orbit interaction or inhomogeneous magnetic field. We derive the spin-photon coupling Hamiltonian, and assess the coupling strength from cavity and quantum dot parameters. Based on these considerations, we identify parameter regimes that are best suited for reaching the strong-coupling regime for the spin-cavity system.

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