

Abstract Submitted
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Electric field dependent g tensor modulation for a hydrogenic Si donor in bulk GaAs¹ AMRIT DE, CRAIG E. PRYOR, MICHAEL E. FLATTÉ, Department of Physics and Astronomy and Optical Science and Technology Center, University of Iowa — We present calculations demonstrating the feasibility of electrical manipulation of a donor bound electron spin using g tensor modulation resonance. We calculate the electron g factor as a function of applied electric field, and show that dg/dE is largest when the applied magnetic and electric fields are parallel. Unlike quantum dots, the donor's g factor is highly nonlinear as a function of the applied magnetic field, and the anisotropy of the g tensor also has a strong magnetic field dependence. The calculations are for a Si impurity in GaAs, and are done using real-space 8-band k.p theory in the envelope approximation.

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