

Abstract Submitted
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Anisotropic Interactions of a Single Spin and Dark-Spin Spectroscopy in Diamond¹ R.J. EPSTEIN, F.M. MENDOZA, Y.K. KATO, D.D. AWSCHALOM, Center for Spintronics and Quantum Computation, University of California, Santa Barbara, CA 93106 — Anisotropic spin interactions of single nitrogen-vacancy color centers in diamond are investigated at room temperature using angle-resolved magneto-photoluminescence microscopy.² Negative peaks in the photoluminescence intensity are observed as a function of both magnetic field magnitude and angle, and are modeled by coherent spin precession and anisotropic relaxation at spin-level anti-crossings. In addition, precise field alignment reveals the resonant magnetic dipolar coupling to nearby dark nitrogen spins, otherwise undetected by photoluminescence. The results present an avenue for transferring spin information between bright spins through the intermediate dark spins.

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²R. J. Epstein *et al.*, Nature Physics **1**, 94 (2005); cond-mat/0507706.

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