

Date:

November 2, 2006

Title

Controlling single spins in the solid state at room temperature

Speaker

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Abstract

Abstract: Nitrogen-Vacancy (N-V) centers in diamond are unique systems: their spin state can be both initialized and read out optically, and they exhibit long spin coherence times even at room temperature. Using imaging techniques along with magneto-photoluminescence and electron spin resonance (ESR) measurements at room temperature, we detect the coupling of single N-V center spins to neighbouring electron spins of substitutional nitrogen atoms. Some N-V centers are strongly coupled to only a single nitrogen spin, allowing the controlled polarization and readout of this spin. Using pulsed ESR, we coherently control the state of a single N-V center spin at room temperature. We find that the magnetic dipolar interaction with substitutional nitrogen spins is the main source of decoherence in our diamond.

Work by: R. Hanson, O. Gywat, F. M. Mendoza, R. J. Epstein and D. D. Awschalom

