Abstract Submitted
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Optically trapped fluorescent nanodiamonds[1] VIVA R. HOROWITZ, BENJAMIN J. ALEMÁN, DAVID CHRISTLE, ANDREW N. CLELAND, DAVID D. AWSCHALOM, Center for Spintronics and Quantum Computation, University of California, Santa Barbara, CA 93106 — The electronic spin state of the nitrogen-vacancy (NV) center in diamond has gained considerable interest because it can be optically initialized, coherently manipulated, and optically read out at room temperature. In addition, nanoparticle diamonds containing NV centers can be integrated with biological and microfluidic systems. We have constructed and characterized an optical tweezers apparatus to trap fluorescent nanodiamonds in a fluid and measure their fluorescence. Particles are held and moved in three dimensions using an infrared trapping laser. Fluorescent detection of these optically trapped nanodiamonds enables us to observe nanoparticle dynamics and to measure electron spin resonance of NV centers. We will discuss applications using the electron spin resonance of trapped NV centers in nanodiamonds for magnetic field imaging in fluidic environments.

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