

Abstract Submitted
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Electric Field Sensing for EDM Experiments. DOUGLAS BECK, University of Illinois at Urbana-Champaign — Nitrogen vacancy diamonds have been proposed for various quantum information devices and were used in a sensitive Bell's theorem test [1]. We describe the status of an electric field sensor using a quantum interference mechanism to enhance its sensitivity. Taking advantage of the linear Stark effect in nitrogen-vacancy diamonds, we use the narrow spectral features associated with the dark states generated via a three-level system (electromagnetically-induced transparency) to measure the energy shifts. The ensemble resolution is typically limited by inhomogeneous broadening caused by the natural ^{13}C admixture in the diamond. In one implementation, an all-optical scheme can be realized to provide a compact, fiberized sensing package operating at cryogenic temperatures. [1] B. Hensen, H. Bernien, A. E. Dreau, A. Reiserer, N. Kalb, et al., *Loophole free Bell inequality violation using electron spins separated by 1.3 kilometres*, Nature **526**, 682 (2015).

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