

Abstract Submitted
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Super-resolution high sensitivity AC Magnetic Field Imaging with NV Centers in Diamond ERIK BAUCH, Department of Physics, Harvard University, Cambridge, Massachusetts 02138, USA, JEAN-CHRISTOPHE JASKULA, Harvard-Smithsonian Center for Astrophysics, 60 Garden Street, Cambridge, Massachusetts 02138, USA, ALEXEI TRIFONOV, Ioffe Physical-Technical Institute RAS, Saint Petersburg, Russia, RON WALSWORTH, Harvard-Smithsonian Center for Astrophysics, 60 Garden Street, Cambridge, Massachusetts 02138, USA — The Nitrogen-Vacancy center in diamond (NV center), a defect consisting of a nitrogen atom next to a missing atom, has become increasingly popular in the last few years. It has been successfully applied as magnetic field sensor, electric field sensor, nanoscale thermometer, fluorescence marker, and single photon emitter. We will present our work on subdiffraction imaging of NV centers and simultaneous sensing of AC magnetic fields with high sensitivity. To demonstrate the applicability of super-resolution magnetic field imaging, we resolve several NV centers within the confocal volume of our setup with an optical resolution smaller than 20 nm and measure the gradient of a magnetic field from a wire. Additionally, we demonstrate the detection of magnetic field signals from 1H protons with subdiffraction image resolution. Our technique paves the way to implement NV centers as a nanoscale electric and magnetic field sensor.

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