

Abstract Submitted
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Phase encoding technique for super-resolution NV magnetometry KEIGO ARAI, Massachusetts Institute of Technology, CHINMAY BELTHANGADY, HUILIANG ZHANG, Harvard-Smithsonian, STEPHEN DEVIENCE, Harvard University, RONALD WALSWORTH, Harvard-Smithsonian — We report recent progress towards improving the spatial resolution of nitrogen-vacancy-center-based magnetometers by use of phase encoding techniques which are widely used in conventional magnetic resonance imaging. Since the electronic spin state of nitrogen-vacancy (NV) centers is initialized and read out optically, the resolution of current NV magnetometers is limited by optical diffraction. By applying magnetic field gradients, spatial information can be imparted to the phase of NV electron spin precession, and the resolution is inversely proportional to the magnitude of the field gradient. We will discuss methods to make magnetic field gradients of 1 T/cm which can be switched at a rate of 1 MHz in order to achieve 100 nm resolution along two spatial directions.

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