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Developing a gradient coil for spatially resolved magnetometry using nitrogen-vacancy centers in diamond[1] ADAM REED, YOUNG WOO JUNG, PENG ZHAO, EZEKIEL JOHNSTON-HALPERIN, MICHAEL POIRIER, P. CHRIS HAMMEL, Department of Physics, The Ohio State University — Magnetic resonance imaging and optical microscopy are major tools in many scientific disciplines, particularly in the biological sciences. In Magnetic resonance imaging, a high magnetic field gradient is used to encode spatial information of the sample into the frequency domain. This allows spatial resolution which is determined by the strength of the field gradient and the magnetic resonance linewidth. Here we present our work on developing a magnetic gradient coil for use in spatially resolved magnetometry based on optical detection of electron spin resonance of nitrogen-vacancy (NV) centers in diamond. We apply a pulsed current through microwires to provide a magnetic field gradient that allow us to distinguish spatially separated volumes of NV centers.

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