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Demonstration of vector magnetometry using N-V center impurities in single crystal diamond YOUNG WOO JUNG, PENG ZHAO, GANG XIANG, EZEKIEL JOHNSTON-HALPERIN, MICHAEL POIRIER, P. CHRIS HAMMEL, Department of Physics, The Ohio State University — N-V centers in diamond have been shown to provide a promising approach to high-sensitivity and high spatial resolution magnetometry at room temperature. We demonstrate vector magnetometry using N-V centers in diamond under ambient conditions. Using a co-planar wave guide we have performed optically detected ESR in commercially available single-crystal diamond containing a high-density of nitrogen impurities. As a first step toward high resolution magnetic field imaging we have imaged the spatial variation of the magnetic field from a small magnet by measuring the variation of the optical ESR signal as a 532nm laser spot is scanned with respect to the magnet. Exploiting the dependence of the NV diamond ESR shift on the orientation of the magnetic field relative to the axis of the NV center we have mapped the magnitude and orientation of the spatially varying magnetic field of the fabricated magnet.

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