

Abstract Submitted  
for the DAMOP19 Meeting of  
The American Physical Society

**NMR spectroscopy using a solid-state spin sensor with enhanced sensitivity** NITHYA ARUNKUMAR, DOMINIK BUCHER, DAVID GLENN, MARK KU, RONALD WALSWORTH, Harvard University — NMR spectroscopy using nitrogen-vacancy (NV) centers is a promising tool for chemical analysis and molecular structure identification, where weak magnetic fields produced by the nuclear spins of the sample are optically measured by the electron spins of the NV center. Conventional, inductively detected NMR can also provide the high spectral resolution, but suffers from poor molecule-number sensitivity and requires millimeter-scale samples. However, NV-NMR spectrometers can observe magnetic signals from sample volumes several orders of magnitude smaller than the most sensitive inductive detectors. But the performance of this ensemble NV magnetometer is limited by the sensitivity of the device. We present a measurement technique to perform high-resolution micron scale NV-NMR spectroscopy with improved sensitivity. We also investigate the influence of the magnetic field and laser power on this measurement technique.

Nithya Arunkumar  
Harvard University

Date submitted: 31 May 2019

Electronic form version 1.4