Abstract Submitted
for the DAMOP15 Meeting of
The American Physical Society

Optimizing the sensitivity of an NV-diamond magnetometer MATTHEW TURNER, Harvard University, DAVID LE SAGE, RONALD WALSWORTH, Harvard-Smithsonian Center for Astrophysics — The nitrogen-vacancy (NV) color center in diamond promises to be an extremely useful tool for precise optical magnetometry. Individual NV centers can function as atomic-scale magnetometers and more sensitive magnetometry can be achieved by averaging the optical signal from a dense ensemble of NV centers. We discuss current state of the art magnetic sensitivities that have been achieved with a compact NV-ensemble magnetometer head. This magnetometer utilizes the optical waveguide properties of the diamond chip to achieve improved photon collection efficiency [1], and achieves improved performance compared with previous demonstrations by taking advantage of improved diamond sample engineering and readout electronics. These ongoing efforts suggest that with additional optimization, the sensitivity of NV magnetometers may soon approach the sensitivities achieved by the best existing magnetometer technologies, with the added practical advantages of being a compact, solid-state, room-temperature device.

[1] D. Le Sage et al., Phys. Rev. B, 85, 121202(R) (2012)

Matthew Turner
Harvard University

Date submitted: 31 Jan 2015 Electronic form version 1.4