

Abstract Submitted  
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**Improvement in  $T_2^*$  via Cancellation of Spin Bath Induced Dephasing in Solid-State Spins** ERIK BAUCH, CONNOR HART, Harvard Univ, JENNIFER SCHLOSS, Massachusetts Institute of Tech, MATTHEW TURNER, Harvard Univ, JOHN BARRY, RONALD L. WALSWORTH, Smithsonian Center for Astrophysics — In measurements using ensembles of nitrogen vacancy (NV) centers in diamond, the magnetic field sensitivity can be improved by increasing the NV spin dephasing time,  $T_2^*$ . For NV ensembles,  $T_2^*$  is limited by dephasing arising from variations in the local environment sensed by individual NVs, such as applied magnetic fields, noise induced by other nearby spins, and strain. Here, we describe a systematic study of parameters influencing the NV ensemble  $T_2^*$ , and efforts to mitigate sources of inhomogeneity with demonstrated  $T_2^*$  improvements exceeding one order of magnitude.

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