Abstract Submitted
for the DAMOP14 Meeting of
The American Physical Society

Low Temperature Symmetric Dynamical Decoupling in NV Centers LINH PHAM, Harvard-Smithsonian Center for Astrophysics, DIMA FARFURNIK, Hebrew University, ANDREY JARMOLA, DMITRY BUDKER, UC Berkeley, NIR BAR-GILL, Hebrew University, RONALD WALSWORTH, Harvard University — Over the past few years nitrogen-vacancy (NV) centers in diamond have emerged as a leading platform for quantum information processing and sensing. Dynamical decoupling schemes have been used to extend the coherence time of NVs up to nearly 1 second at cryogenic temperatures. However, thus far most research focused on single axis decoupling (namely CPMG sequences), which are not as useful for practical applications. Here we extend previous work, studying the coherence times achievable using symmetric decoupling sequences (namely the XY family), both at room temperature and at low temperatures. We analyze the effects of pulse errors, which become significant in this regime, and address potential applications, such as enhanced magnetometry, quantum memory, and interaction-dominated dynamics.

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Date submitted: 31 Jan 2014 Electronic form version 1.4