

Abstract Submitted
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Spin noise in mixed Spin Systems ERIK BAUCH, Harvard Univ, PAUL JUNGHYUN, Massachusetts Institute of Technology, SWATI SINGH, MIT-Harvard Center for Ultra Cold Atoms, TRITHEP DEVAKUL, ADRIAN FEGUIN, Northeastern University, CONNOR HART, Harvard Physics, RONALD WALSWORTH, Harvard-Smithsonian Center for Astrophysics — The spin noise due to interaction of multiple spin species in mixed spin systems provides a fundamental limit to ultra-sensitive ensemble sensing and quantum information applications. In our work, we investigate the interaction of dense nuclear ^{13}C spins with electronic nitrogen spins using Nitrogen-Vacancy centers in diamond. Our work shows experimentally and theoretically, that under certain conditions, spin noise is greatly suppressed and the coherence time of NV centers improved by order of magnitudes, providing a pathway to engineering high density ensemble samples with long coherence times at room temperature.

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