

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Sorting Category: 17.1.5 (T)

Noises of spin baths for qubits in diamond ZHIHUI WANG, ANIRBAN DAS, DANIEL LIDAR, SUSUMU TAKAHASHI, University of Southern California — Nitrogen-vacancy (NV) center in diamond is a promising qubit candidate for quantum information processing and high precision magnetometry and is an excellent platform for studying quantum spin dynamics [1,2]. Overcoming spin decoherence of NV centers is critical to the applications. Coupling to spin baths of paramagnetic impurities and nuclei is a major decoherence source for NV centers. Therefore, recent theoretical and experimental efforts have aimed at suppressing the bath noises. In this presentation, we will discuss effects of the spin baths on the qubits at different regimes including high magnetic fields where the degree of the electron spin polarization is almost complete [3]. We will also discuss dynamical decoupling sequences to investigate spin bath noises.

[1] R. Hanson et al., *Science*. **320**, 352 (2008).

[2] G. de Lange et al., *Science*. **330**, 60 (2010)

[3] S. Takahashi et al., *Phys. Rev. Lett.***101**, 047601 (2008)

Prefer Oral Session
 Prefer Poster Session

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Date submitted: 12 Dec 2011

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