

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Quantum theory of nuclear spin dynamics in optically pumped diamond nitrogen-vacancy center PING WANG, WEN YANG, Beijing Computational Science Research Center, Beijing 100084, China — We develop a microscopic theory for a variety of nuclear spin dynamics such as dephasing, relaxation, squeezing, and narrowing due to the hyperfine interaction with an optically pumped nitrogen vacancy center. The first-order result justifies the nonlinear Hamiltonian for nuclear spin squeezing [M. S. Rudner et al., Phys. Rev. Lett. 107, 206806 (2011)]. The second-order result provides a reasonable explanation to the experimentally observed ^{13}C nuclear spin bath narrowing [E. Togan et al., Nature 478, 497 (2011)].

Ping Wang
Beijing Computational Science Research Center, Beijing 100084, China

Date submitted: 13 Nov 2014

Electronic form version 1.4