

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Spin-lattice relaxation in Diamond NV-Centers JOHANNES GUGLER, PETER MOHN, Vienna Univ of Technology — Nitrogen-Vacancy centers in Diamond exhibit a very long electronic spin-relaxation time T_1 . Thus, they are a promising candidates for solid-state qubit implementation. The temperature dependence of T_1 at the mK-temperature scale was not understood up to now. We performed DFT-calculations to obtain the structural, electronic and phononic properties of the NV-center in Diamond to investigate on the spin-lattice relaxation rate. Using the numerically obtained wavefunctions and the phononic bandstructure we calculated the electron-phonon transition matrix element of first order in time dependent perturbation theory. Taking into account spin-orbit coupling and the electronic screening of the electron-ion potential, we obtain the temperature dependence and the relaxation rates in agreement with experiment.

Johannes Gugler
Vienna Univ of Technology

Date submitted: 10 Nov 2016

Electronic form version 1.4