

Abstract Submitted
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Characterization of Spin-Lattice Relaxation Times of Impurity Centers in Diamond with Superconducting Circuits¹ N. ANTLER, S. HACHOHEN-GOURGY, D. TOYLI, E. LEVENSON-FALK, QNL, UC Berkeley, A. JARMOLA, P. KEHAYIAS, D. BUDKER, Dept. of Physics, UC Berkeley, I. SIDDIQI, QNL, UC Berkeley — We present measurements of the T_1 relaxation times of impurity centers in diamond below 4 K obtained with both a nanobridge SQUID magnetometer and a superconducting resonator with an independent broadband excitation line. We show temperature, field and power dependence of the P1 center relaxation times, and discuss how these dependences fit within current models of spin-lattice relaxation and spin diffusion. These measurements are a step toward identifying the dominant spin-lattice relaxation processes in diamond at cryogenic temperatures, and optimizing such solid-state devices for quantum information processing.

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