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Double/Triple resonance of electron spin in diamond: Quantum sensing and manipulation

Junko Ishi-Hayase*Keio University*

Abstract

Nitrogen-vacancy (NV) centers in diamond have been attractive candidates for implementing quantum sensors, since electron spin states of NV centers can be coherently manipulated using microwave (MW) field and optically initialized/readout with long coherence time at room temperature. In this study, we demonstrate AC magnetic field and/or temperature sensing based on electron spin double- or triple-resonance of NV centers in diamond observed under the continuous application of laser, MW and radio-frequency (RF) fields[1-5]. In addition, we show the analysis of electron spin state observed under the strong MW/RF fields using Floquet theory[6] and Lindblad master equation.

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