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Simulation of photo dynamics in NV centers with Qutip

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Nitrogen vacancy (NV) center in diamonds have gained a lot of attention in recent years as a very versatile platform in quantum technologies, with applications in various fields of quantum information processing and can be use as a platform from low to high temperatures, and can have very high decoherence times in room temperature. NV center states can be optically measured through a few techniques and for that reason being able to simulate it's dynamics is very important for a better understanding on how to control its states and operate it in different protocols and regimes. In this work we will present a model for its dynamics (1) as well as one of the protocols for optical readout of its states, namely the Optically detected microwave resonance (ODMR) in two regimes, continuous wave (CW-ODMR) and pulsed (Pu-ODMR) in a simulated environment using a well known python package, Qutip, for its versatility (2-3). With that we intend on having an environment to apply different control techniques and explore the potential of NV centers in multiple contexts.

Palavras-chave: NV center; Quantum simulation; Quantum information.

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