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The spin state depolarization induced by charge state conversion of Nitrogen Vacancy center in diamond XIANGDONG CHEN, Univ of Sci & Tech of China, CHANGLING ZOU TEAM, LEIMING ZHOU TEAM, FANGWEN SUN TEAM — The negatively charged nitrogen vacancy center (NV^-) in diamond possesses the optically polarized electron spin state, which enables it to be used for quantum computation and metrology. In this work, we showed the depolarization of NV^- electron spin state induced by charge state conversion. Both the polarization and depolarization of spin state exist during the two-photon charge state conversion process. The fidelity of NV^- spin state initialization is decreased with the laser power. Due to the charge state conversion induced spin state depolarization, the fluorescence intensity of NV center shows a decrease with high laser power. Our work provide the information to further understand the photon induced charge state conversion, and can help to optimize the application based on NV center.

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