THE COMPETITION OF CHARGE STATE CONVERSION AND STIMULATED EMISSION IN NV CENTERS INDUCED BY NIR LASER

Bo Du, Xiang-Dong Chen, Shao-Chun Zhang, Yang Dong, Cui-Hong Li, Guang-Can Guo and Fang-Wen Sun

University of Science and Technology of China,

Hefei, 230026, P.R. China

E-mail: dubo@mail.ustc.edu.cn

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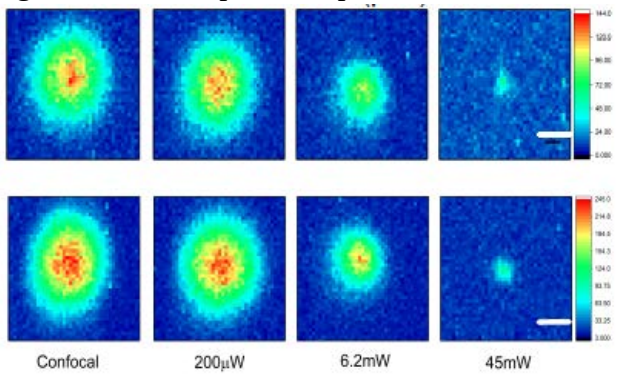
Nitrogen-vacancy (NV) center in diamond have been proved as a promising system in quantum sensing and super-resolution imaging. In this work, we experimentally studied the dynamic of NV centers under green and near-infrared (NIR) laser excitation, and further applied in stimulated emission depletion (STED) microscopy. By fluorescence and population detection, we find that under the green and NIR laser excitation, there are two processes: the charge state conversion and the stimulated emission, competing with each other and leading to fluorescence transition from enhancement to depletion. Then we studied STED microscopy. This work offers a full understanding of the dynamic of NV centers under NIR excitation and a guidance in the power dependence of STED microscopy.



The single NV centers and FNDs with size of 50-nm were tested in STED Microscopy. A series pictures visually expressed the NIR laser induced dynamics of NV centers. Different power leading to the resolution variance, which is not simply in accord with STED imaging

Figure 1: STED images of single NV center.

Reference:

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