



Diamond particles as nanoantennas for nitrogen-vacancy color centers

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The photoluminescence of nitrogen-vacancy (NV) centers in diamond nanoparticles exhibits specific properties as compared to NV centers in bulk diamond. For instance large fluctuations of lifetime and brightness from particle to particle have been reported. It has also been observed that for nanocrystals much smaller than the mean luminescence wavelength, the particle size sets a lower threshold for resolution in Stimulated Emission Depletion (STED) microscopy. We show that all these features can be quantitatively understood by realizing that the absorption-emission of light by the NV center is mediated by the diamond nanoparticle which behaves as a dielectric nanoantenna.

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