

Study of photophysical characteristics of H3 centers in diamond

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Diamond color centers are in high demand in emerging photonic technologies such as quantum computing, single-photon sources, and magnetic field sensors. H3 centers are of great interest as an active medium for laser generation in the 500–600 nm range [1, 2]. Implementing such technologies requires precise measurements of the photophysical characteristics of the centers, which are currently known from outdated measurements from the 1980s [3].

In this study, the emission cross section was measured using two methods. The first method is based on studying the photoluminescence yield under pumping with ultrashort 150-fs laser pulses of variable intensity. The second method determines the emission cross section based on the luminescence decay kinetics. The values obtained using these methods, $2.7 \times 10^{-15} \text{ cm}^2$ and $2.0 \times 10^{-15} \text{ cm}^2$, agree well with each other and exceed the published value of $1.6 \times 10^{-16} \text{ cm}^2$ by an order of magnitude.

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