PHOTOLUMINESCENCE OF THE HPHT DIAMOND SAMPLES CONTAINING NV CENTERS UPON EXCITATION BY LASER AND SPONTANEOUS UV AND VISIBLE RADIATION*

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NV centers in diamond are potentially suitable for quantum information technology applications at room temperature. In this regard, the urgent task of obtaining laser generation in the luminescence band of NV centers. In the future, integrated NV-containing components will be needed when creating photonic integrated circuits, optoelectronic modules for quantum key distribution, and controlling of qubits based on NV centers in solid-state quantum computers.

In this work, we present experimental results on the study of the photoluminescence of diamond samples with a concentration of NV centers about ~ 10^{16} cm^{-3} when excited by optical radiation of excimer lasers and spontaneous emission of excilamps in the range of 222-532 nm. Photoluminescence spectra demonstrate, including intense luminescence of NV centers in a neutral charge state, as well as electron-vibrational centers associated with radiation destruction of the diamond lattice

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