

# Incoherent illumination system based on synthetic diamond for shadow recording of fast processes

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The possibility of creating a high-brightness pulsed light source in the visible wavelength range with low temporal coherence based on synthetic diamond for highlighting fast moving objects during shadow registration with a photographic plate or digital camera in gas dynamic experiments has been numerically and experimentally investigated.

The use of a pump picosecond laser combined with a light converter based on synthetic diamond containing NV-color centers as a illumination system makes it possible, while maintaining high brightness and a short duration (less than 1 ns) of an illumination pulse, to increase the resolution of the shadow registration method several times. High resolution is achieved by reducing the temporal coherence of the illumination light due to broadening its spectral band in a diamond plate with a wide gain line in the visible region of the spectrum placed in an optical resonator.

The report presents the results of theoretical calculations of the main parameters of the proposed pulsed light source and the results of the first experiments on its creation.