

## Investigation of the spread of a diffracted Gaussian beam in the Fresnel diffraction region

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An experimental study of the spatial distribution of the light intensity of the diffraction pattern was performed by two methods: the method of photography and the method of a moving photodetector. Using the Wolfram Mathematica software package, the spatial intensity distribution of the diffracted Gaussian beam diffracted on the slit and the round hole due to Fresnel diffraction was calculated, and the intensity distribution was modeled. An analysis and comparison of theoretically calculated and experimentally measured diffraction patterns were performed.

Spatial distribution of the diffraction picture obtained by using a digital camera and software written in Python language compared with theoretically calculated and with the distribution obtained by the photomultiplier tube. The accuracy and feasibility of using this method is determined.

### Topics

Session B. Laser physics and modern optoelectronics

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