MEASUREMENTS OF CHARACTERISTICS OF LASER BEAMS APPLIED IN PROCESSING OF MATERIALS

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ABSTRACT *The results of measurements of characteristics of laser beams applied in processing of materials are described in the paper. The scheme of experimental setup is described. The specific properties of Gaussian laser beams are posted. The procedure for determination of laser beam quality parameter, the so called M^2 parameter is discussed. The laws of similarity of beams focused by different lenses are included. Distributions of energy density in the beam cross-section, temporal pulse shape, stability of laser power versus time were measured. The M^2 parameter was calculated. The measurements were performed for He-Ne, fiber CW SPI-100C, pulsed Ylia M20EG and picosecond lasers. Some examples of factors influencing measurements errors are listed. Some examples of laser marking process are provided.*

Keywords: *laser pulse, M^2 parameter, Gaussian beam, similarity laws for focusing systems*