

NEW VIEW ON THE DIFFRACTION DISCOVERED BY GRIMALDI, THE CLASSICAL THEORY OF LIGHT AND GAUSS BEAMS

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In work [1] the descriptive geometry optic model on the basis of consideration of binomial distribution for the description of distribution of light in the laser was offered. In work [2] on the basis of research of this geometrical model the binomial of the second, not Newtonian type was offered.

Actually in work [1] the descriptive geometrical figure representing from a position of graph theory "tree" which number of branches on each (conditionally chosen) step doubles was offered. Such approach corresponds to the term "diffraction" (from Latin "diffringere" – to break, split in two ("di-ffraction")) entered by the Italian physicist Grimaldi (1665) who has discovered this light phenomenon [3, 4].

In offered work short historical excursus to the classical theory of light is presented: Grimaldi, Fermat, Newton, Huygens, Young, Fresnel, Fraunhofer, Gauss. The ray analog of wave model of light and Huygens-Fresnel's elementary waves on the basis of consideration of geometrical model is offered. Gauss beams, including having normal distribution, are widely applied in optics, and in laser equipment [5]. In the present work we investigate new geometrical models (structures) of the gauss beams leading to normal distribution. The new, generalized interpretation of an angle of diffraction divergence of beams of light is given. Difference of geometrical properties of wave fronts of infinite and finite length is shown. Examples of possible application of our geometrical model in various areas are given.

Literature

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