BIFURCATIONS OF RAYS IN LASERS, NON-LINEAR ARITHMETIC PYRAMID AND NON-LINEAR ARITHMETIC TRIANGLES

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Usually wave and geometric (ray) models and equivalent light guide schemes are used for the descriptions of processes in lasers [1].

The geometric model based on binomial distribution is proposed in [2] for the description of light propagation in a multilobe mirror laser. Multilobe mirrors were proposed in [3] and consist on many semi-conducting planes slightly inclined to the laser axis and rotated symmetrically around the axis. Light reflects conically (hole cones) from this mirror. We consider the mirror is thin. In the plane (two-dimensional) case one ray bifurcates after the reflection from our mirror. In [4, 5] we investigated the branching system of rays consisted on units of breaking trajectories, we considered the Fibonacci type rows to describe this system.

In the present work we describe our light guide system more precisely.

We show the correspondence of ray groups and binomial coefficients.

We show the correspondence of ray distribution and integers arranged in a three-dimensional table – non-linear pyramid [6].

We examine two types of non-linear arithmetic triangles.

We describe different types of integer's partitions.

We hope this investigation help to examine the processes in lasers more precisely.

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