Abstracts

Probability of Ray Position in Beam Waveguides

D. Marcuse. "Probability of Ray Position in Beam Waveguides." 1967 Transactions on Microwave Theory and Techniques 15.3 (Mar. 1967 [T-MTT]): 167-171.

For the case of infinitely large apertures the following probability distributions are derived in this paper: the probability of finding a ray at the nth lens at a distance r from the axis, the probability of finding a ray with an amplitude A at lens n, the cumulative probability of finding a ray with a displacement less than r and the cumulative probability of finding a ray with an amplitude less than A. The case of lenses with finite apertures was explored with the help of computer simulated experiments whose results are given. These experiments show that the probability distributions for the ray amplitudes which were derived for infinite apertures are still useful even in the case of lenses with finite apertures as long as the probability of losing the ray is less than 20 percent.

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