Abstracts

Ray Theory of Resonators and Beam Waveguides with an Inhomogeneous Medium

Important characteristics of optical resonators and beam waveguides can be inferred from simple ray-optical considerations. The ray theory is susceptible to an extremely convenient algebraic formulation from which a formal analogy in terms of electrical networks is evident. Most of the available results for optical resonators and beam waveguides assume the medium within the structure to be homogeneous and isotropic. In laser applications of optical resonators the medium is certainly inhomogeneous and, furthermore, dispersive. A ray analysis is carried through for these complex cases, and yields some very interesting and general conclusions. In particular, the stability of the ray systems, i.e., discrimination between high and low-loss configurations, is discussed in terms of a generalization of Pierce's criterion. For simplicity, two-dimensional systems are considered; the extension to three dimensions follows directly.

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