Abstracts

The Confocal Resonator System with a Large Fresnel Number (V-Type Eigenmodes) (Correspondence)

H. Lotsch. "The Confocal Resonator System with a Large Fresnel Number (V-Type Eigenmodes) (Correspondence)." 1964 Transactions on Microwave Theory and Techniques 12.4 (Jul. 1964 [T-MTT]): 482-483.

Multimode resonators with open-walled structure pose a boundary value problem which cannot be solved analytically. It must be treated by methods of approximation. Several approaches, essentially based upon Huygens' Principle, have been reported in recent literature. The author has recognized that Huygens' Principle and the Huygens-Fresnel Principle may differ significantly if boundary conditions must be considered. He has developed a resonator theory which is applied to the V-type eigenmodes of a confocal resonator system (the individual wave trains travel along V-shaped paths). We summarize the essential results and refer to Lotsch for a detailed discussion. We define an eigenmode as an energy distribution which, when launched from the plane of symmetry, reproduces itself on this same mathematical plane after a complete round trip between the reflectors. We learn from Fig. 1 that an eigensolution is reproduced in the plane of symmetry after each reflection and thus four times per eigenmode. We postulate a self-consistent field distribution for such a section of an eigenmode. We assume that this distribution can be rep-resented as E/sub y/(x, y) = E/sub 0/X (x) Y(y), where E/sub 0/ is a constant amplitude factor, X(x) a function of x only and Y(y) a function of y only.

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