Abstracts

Ray-Optical Calculation of Edge Diffraction in Unstable Resonators

C.E. Santana and L.B. Felsen. "Ray-Optical Calculation of Edge Diffraction in Unstable Resonators." 1978 Transactions on Microwave Theory and Techniques 26.2 (Feb. 1978 [T-MTT]): 101-108.

A previously developed ray-optical theory for calculation of modal reflection and coupling coefficients due to edge discontinuities in homogeneously or inhomogeneously filled parallel-plane waveguides is generalized to waveguides with nonplanar boundaries. Treated in particular are the reflections from the open ends of a bilaterally truncated waveguide whose convex walls are confocal hyperbolas. This open configuration serves as a model for unstable optical resonators with cylindrical mirrors. The ray optically determined modal reflection and coupling coefficients for mirrors with large Fresnel number are shown to reduce to those in a previously employed local parallel-plane approximation when the Fresnel numbers are moderate. The analysis quantifies proposed ray-optical models for explaining the influence of edge diffraction on the behavior of the resonant modes.

❑ Return to main document.