Abstracts

Mode Conversion at Diffracting Apertures in Millimeter and Submillimeter Wave Optical Systems

J.A. Murphy, S. Withington and A. Egan. "Mode Conversion at Diffracting Apertures in Millimeter and Submillimeter Wave Optical Systems." 1993 Transactions on Microwave Theory and Techniques 41.9 (Oct. 1993 [T-MTT] (Special Issue on Quasi-Optical Techniques)): 1700-1702.

Diffraction effects, which occur when the fields in a beam waveguide are truncated at absorbing stops, can be conveniently analyzed using scattering-matrix theory applied to Gaussian-beam modes. We present recursion relationships for the elements of the scattering matrix when a nonaxially-symmetric beam illuminates an axially symmetric stop. We demonstrate the technique by calculating the total loss and beam profiles in a system comprising a diagonal horn, a lens, a window, and two off-axis mirrors. The finite size of each component is taken into account.

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