Abstracts

Ray-Optical Analysis of Electromagnetic Scattering in Waveguides

H.Y. Yee and L.B. Felsen. "Ray-Optical Analysis of Electromagnetic Scattering in Waveguides." 1969 Transactions on Microwave Theory and Techniques 17.9 (Sep. 1969 [T-MTT]): 671-683.

The ray-optical method presented previously for the analysis of scalarizable waveguide discontinuity problems is extended to vector scattering problems wherein an incident TE or TM mode excites both mode types. The procedure is illustrated first for reflection of an obliquely incident mode from the open end of a parallel plane waveguide, and is then applied to reflection from an open-ended circular waveguide. Formulas for modal reflection and coupling coefficients are given to various degrees of approximation, depending on whether or not multiple interaction phenomena are considered in addition to the simplest primary diffraction effects. Comparison with data computed from exact solutions for the circular waveguide problem shows that the ray-optical method is remarkably accurate not only in the strongly overmoded but also the dominant mode regimes.

❑ Return to main document.