Abstracts

A Perturbation Method for the Analysis of Wave Propagation in Inhomogeneous Dielectric Waveguides with Perturbed Media

This paper presents a perturbation method for determining the modes and the propagation constants of TE and TM waves in inhomogeneous dielectric waveguides whose index distributions depart from well-known profiles; e.g., a parabolic profile for which exact solutions can be obtained. Applying the variable-transformation technique to the wave equations, the wave-equation problem is transformed into the related-equation problem. The approximate solutions of the wave equations are obtained solving the related equation. The method is applied to the analysis of lower order mode propagation in a near-parabolic-index medium. The first-order field functions and the second-order propagation constants are given.

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