Abstracts

Vector Analyses of Propagation Constants in Dielectric Optical Waveguides with Perturbed Refractive-Index Profile

M. Miyagi and S. Nishida. "Vector Analyses of Propagation Constants in Dielectric Optical Waveguides with Perturbed Refractive-Index Profile." 1985 Transactions on Microwave Theory and Techniques 33.8 (Aug. 1985 [T-MTT]): 667-673.

A new method is developed to evaluate the propagation constants of guided or leaky modes in cylindrical dielectric optical waveguides with arbitrary cross sections. It is assumed that the refractive-index profiles of the fiber deviate from the step-index ones. Format expressions of the propagation constants are given for waveguides with anisotropically perturbed refractive-index profiles. The method is applied to a circular step-index fiber with an azimuthally perturbed refractive-index profile, and it is shown that scalar analyses cannot properly predict the propagation constants of those modes whose angular order satisfies certain conditions with respect to the Fourier spectrum of the perturbation of the refractive-index profile.

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