Abstracts

IEEM FFT - A Fast and Efficient Tool for Rigorous Computations of Propagation Constants and Field Distributions in Dielectric Guides with Arbitrary Cross-Section and Permittivity Profiles

M.P. Mrozowski. "IEEM FFT - A Fast and Efficient Tool for Rigorous Computations of Propagation Constants and Field Distributions in Dielectric Guides with Arbitrary Cross-Section and Permittivity Profiles." 1991 Transactions on Microwave Theory and Techniques 39.2 (Feb. 1991 [T-MTT]): 323-329.

An efficient approach to the analysis of dielectric guides is presented. The technique described is based on a recently proposed iterative scheme, known as the iterative eigenfunction expansion method (IEEM), which was designed specifically to allow the rigorous analysis of dielectric guides of arbitrary cross section and permittivity profile. In the approach presented herein, which we shall call the IEEM FFT, the bottleneck of the IEEM is removed by the application of the FFT to the calculation of the inner product. As a result, a reduction in the computer storage and an increase in speed are achieved. In some aspects the method seems to be superior to certain full-wave approaches, including the finite difference and finite element methods. It is believed that the method can be used for investigating guides used in millimeter-wave techniques, optical fibers with arbitrary cross section and refractive index profiles, and nonlinear effects in electromagnetic wave propagation.

❑ Return to main document.