Abstracts

A Combined Efficient Approach for Analysis of Nonradiative Dielectric (NRD) Waveguide Components

K. Wu. "A Combined Efficient Approach for Analysis of Nonradiative Dielectric (NRD) Waveguide Components." 1994 Transactions on Microwave Theory and Techniques 42.4 (Apr. 1994, Part I [T-MTT]): 672-677.

An efficient approach is introduced for the analysis of three-dimensional nonradiative dielectric (NRD) waveguide components including inhomogeneous dielectric and housing grooves. This technique combines effectively the method of lines with the mode-matching method based on the theoretical principle similar to that of the space-spectral domain approach (SSDA). It can be applied to determine characteristics of various waveguide components and microwave integrated circuits such as resonant frequencies and scattering parameters. The framework of this technique is demonstrated in this paper through its applications to resonator problems. Absorbing boundary conditions (ABC) with two types of difference schemes were used to simulate unbounded space. It is found that numerical results of resonant frequency for the first two fundamental modes (quasi-LSM and quasi-LSE) are in good agreement with our experiments. Numerical results are presented for both homogeneous and inhomogeneous dielectric resonators as functions of different geometric parameters.

❑ Return to main document.