Abstracts

Numerical Analysis of Arbitrarily Shaped Discontinuities Between Planar Dielectric Waveguides with Different Thicknesses

K. Hirayama and M. Koshiba. "Numerical Analysis of Arbitrarily Shaped Discontinuities Between Planar Dielectric Waveguides with Different Thicknesses." 1990 Transactions on Microwave Theory and Techniques 38.3 (Mar. 1990 [T-MTT]): 260-264.

An approach that combines the finite-element and boundary-element methods is applied to the analysis of arbitrarily shaped discontinuities between planar dielectric waveguides with different thicknesses. The fields interior and exterior to the region enclosing the discontinuities are treated by the finite-element and the boundary-element method, respectively. The waveguide regions connected to the discontinuities are handled by analytical solutions. In this approach, scattering characteristics of the discontinuities can be accurately evaluated, and far-field radiation patterns can be easily calculated. To show the validity and usefulness of this approach, the scattering characteristics of a step, a staircase transformer, and a tapered transformer are analyzed. Also, a simple equivalent network approach is introduced for estimating the reflection and transmission characteristics of planar dielectric waveguide discontinuities, and the effectiveness of this simple approach is confirmed by comparing the numerical results with those of the approach that combines the finite-element and boundary-element methods.

❑ Return to main document.