# Abstracts

## A New Equivalent Network Method for Analyzing Discontinuity Properties of Open Dielectric Waveguides

*H. Shigesawa and M. Tsuji. "A New Equivalent Network Method for Analyzing Discontinuity Properties of Open Dielectric Waveguides." 1989 Transactions on Microwave Theory and Techniques 37.1 (Jan. 1989 [T-MTT]): 3-14.*

A novel network approach is proposed for analyzing interacting discontinuities on open planar dielectric waveguides by accurately taking account of both surface modes and waves with continuous spectra. In our approach, a continuum of the radiation wave is recomposed into a set of the newly defined "spectral composite" modes, each of them carrying a finite magnitude of radiation power, and these new modes, in conjunction with surface modes, construct the complete orthonormal set for expressing an arbitrary local field on a dielectric slab waveguide. This idea allows us to provide the modal voltages and currents of the spectral composite modes in the identical definition with those for the surface modes with discrete eigenvalues, thereby developing an equivalent network approach effective for solving discontinuity problems, even on an open waveguide, with the familiar approach for closed waveguide problems. A number of numerical results are shown to prove the usefulness of our approach.

❑ Return to main document.