# Abstracts

## A New Edge Element Analysis of Dispersive Waveguiding Structures

*J. Tan and G. Pan. "A New Edge Element Analysis of Dispersive Waveguiding Structures." 1995 Transactions on Microwave Theory and Techniques 43.11 (Nov. 1995 [T-MTT]): 2600-2607.*

A new functional is rigorously selected for the edge element method to solve the 2 - D 1/2 guided wave problems. The variational formulation is derived from the vector wave equation without any assumption or simplifications, and therefore the formulation is the full-wave analysis. Moderate to heavy ohmic loss and dielectric loss are taken into account in a natural and consistent manner. As a result, finite cross-section of arbitrary shape and finite conductivity can be handled without imposing the impedance boundary condition (IBC). The IBC may no longer be held for high-speed microelectronics applications, where the cross-section dimension may have been in the same order of the skin depths of some frequency components. The propagation modes are obtained by solving the large scale generalized eigenvalue and eigenvector equations employing the subspace iteration method. The spurious modes are totally suppressed in the whole frequency range of interest. Numerical examples of dielectric waveguide, microstrip transmission lines with finite conductivity are conducted and compared with previous publications with good agreement.

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