# Abstracts

## A Variational Theory for Wave Propagation in Inhomogeneous Dielectric Slab Loaded Waveguides

*C.-T. Liu and C.H. Chen. "A Variational Theory for Wave Propagation in Inhomogeneous Dielectric Slab Loaded Waveguides." 1981 Transactions on Microwave Theory and Techniques 29.8 (Aug. 1981 [T-MTT]): 805-812.*

A novel numerical technique based on the variational formulation defined only in the slab is developed to study the loaded rectangular waveguide with an inhomogeneous dielectric slab. The variational equation for the boundary value problem is formulated and solved numerically, using the finite element method with piecewise quadratic trial functions. A comparison of this new technique with the conventional variational ones is presented. Various propagation characteristics, such as the phase constant, useful bandwidth, power handling capacity, and attenuation constants due to conductor and dielectric losses, are investigated for the waveguide centrally loaded with a slab of parabolic dielectric profile. The effects of changes in dielectric profiles are discussed by examining the results for the slabs with constant and parabolic profiles.

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