# Abstracts

## On the Variational Reaction Theory for Dielectric Waveguides

*R.-B. Wu and C.H. Chen. "On the Variational Reaction Theory for Dielectric Waveguides." 1985 Transactions on Microwave Theory and Techniques 33.6 (Jun. 1985 [T-MTT]): 477-483.*

By the reaction concept, a variational theory is established for treating the scattering and propagation problem associated with a dielectric waveguide which is illuminated by an obliquely incident plane wave. The theory is characterized by properly absorbing radiation and continuity conditions into the variational equation. This equation is then solved by the finite-element method together with the frontal solution technique. In this paper, the propagation constants of the guide are obtained by the procedure of searching for the poles of the scattering coefficients when an inhomogeneous wave is incident. Two most attractive features of this approach are the avoidance of the spurious modes and the accuracy of the results even for the modes near cutoff. Although the proposed theory may be applied to dielectric waveguides of arbitrary cross section, only the one with rectangular shape is investigated in detail. Also included in this study are numericul results for the propagation constants in discussing the effects due to differences in refractive indices, aspect ratios, and index profiles.

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