Abstracts

Application of a Variation-Iteration Method to Waveguides with Inhomogeneous Lossy Loads

A.A. Laloux, R.J.M. Govaerts and A.S. Vander Vorst. "Application of a Variation-Iteration Method to Waveguides with Inhomogeneous Lossy Loads." 1974 Transactions on Microwave Theory and Techniques 22.3 (Mar. 1974 [T-MTT] (Special Issue on Computer-Oriented Microwave Practices)): 229-236.

An approximate technique for solving eigenvalue equations, the variation-iteration method, is commonly used in theoretics physics. A previous paper presented the application of this method to the scalar case of a dielectric slab loaded rectangular waveguide. This paper presents its extension to the complex vector case of a lossy dielectric insert loaded waveguide. Starting from an initial trial function, iterates are calculated in which the components relative to the unwanted eigenfunctions are eliminated. Both an upper and a lower bound for the unknown eigenvalues are available. Each iterate is the solution of a system of algebraic simultaneous equations. This system is solved by the successive overrelaxation method using an automatically computed optimal accelerating factor. An extrapolation technique further accelerates the convergence. This yields the attenuation and propagation coefficients for the dominant as well as several other modes, together with the electric and magnetic field configurations.

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