Abstracts

A Finite-Difference Method for the Third-Order Simplified Wave Equation: Assessment and Application

A finite-difference method for coding the third-order simplified one-way wave equation is analyzed and assessed for application to two-dimensional waveguide structures. The general formulation for the simplified one-way wave equations based on the expansion of the eigenvalue equation is briefly discussed. The stability criteria of the finite-difference schemes are analyzed by applying the von Neumann method. Numerical dissipation is studied by calculating the power attenuation along the propagation direction. Finally, the EM wave propagation and scattering in the small and medium size open-ended parallel-plate waveguide cavities are calculated by using the method, and are compared with modal solutions.

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