Abstracts

Efficient Full-Wave 3D and 2D Waveguide Eigenvalue Analysis by Using the Direct FD-TD Wave Equation Formulation

V.J. Brankovic, D.V. Krupezevic and F. Arndt. "Efficient Full-Wave 3D and 2D Waveguide Eigenvalue Analysis by Using the Direct FD-TD Wave Equation Formulation." 1993 MTT-S International Microwave Symposium Digest 93.2 (1993 Vol. II [MWSYM]): 897-900.

A modified finite-difference time-domain (FD-TD) formulation based on the direct discretization of the vector wave-equation is applied for the efficient analysis of hybrid-mode waveguiding structures. For both three- (3D) and two-dimensional (2D) waveguide eigenvalue problems, the FD-TD wave equation formulation requires advantageously only one grid, and merely the solution of three coupled equations are necessary. Numerical examples for the resonance frequencies for an inhomogeneously filled waveguide resonator, as well as for the fundamental- and higher-order-mode propagation factors for insulated image guides, shielded coupled dielectric guides, and lateral open dielectric ridge guides demonstrate the efficiency of the method. The theory is verified by comparison with results obtained by other methods.

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