Abstracts

Numerical Stability and Numerical Dispersion of a Compact 2-D/FDTD Method Used for the Dispersion Analysis of Waveguides

The stability condition is derived for the compact two-dimensional FDTD (2-D/FDTD) scheme which was recently proposed for the dispersion analysis of waveguiding structures. It is shown that the upper limit of the Courant number depends on the desirable propagation constant beta and is always smaller than the one for the standard FDTD scheme in two dimensions. The dispersion equation for the numerical scheme is derived also and is used to examine the impact of grid size on the accuracy of the calculated eigenvalues (frequencies) for the dominant and higher order modes.

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