Abstracts

Numerical dispersion and stability analysis of the FDTD technique in lossy dielectrics

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Two different extensions of the finite-difference time-domain (FDTD) method for the treatment of lossy dielectrics are considered: the time-average (TA) and the time-forward (TF) difference schemes. An analytical study of the stability properties and numerical dispersion of these schemes is presented. The stability analysis is based on the Von Neumann (Fourier series) method, while the numerical dispersion properties are established in terms of the numerical permittivity of discrete lossy dielectrics. The analytical stability limits are compared with those obtained numerically in previous works. The accuracy of the two schemes is compared by computing the reflection coefficient of a lossy dielectric slab.

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