Abstracts

A hybrid implicit-explicit FDTD scheme for nonlinear optical waveguide modeling

V. Van and S.K. Chaudhuri. "A hybrid implicit-explicit FDTD scheme for nonlinear optical waveguide modeling." 1999 Transactions on Microwave Theory and Techniques 47.5 (May 1999 [T-MTT]): 540-545.

A hybrid implicit-explicit finite-difference time-domain (FDTD) method for solving the wave equation in nonlinear optical waveguiding structures is proposed. The new scheme combines the computational simplicity of the explicit scheme in linear medium regions with the superior stability property of the partially implicit scheme in regions of nonlinear materials, thus eliminating potential problems of instability associated with nonlinearity. Simulation results for Kerr-type nonlinear slab waveguides and corrugated waveguides are presented and compared with those obtained using the conventional noniterative FDTD scheme.

❑ Return to main document.