Abstracts

Nonlinear FDTD Formulations Using Z Transforms

An implementation of the FDTD method for nonlinear optical simulation is described. This method draws on ideas from digital filtering theory by formulating the nordinearities using Z transforms. This provides a means of directly calculating the nonlinear polarizations in a straightforward manner. Further, an analytic expression for the reflection coefficient from a nonlinear dielectric is described and used to confirm the accuracy of the nonlinear FDTD formulation. Finally, a one-dimensional nonlinear FDTD simulation is used to calculate soliton propagation in nonlinear media.

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