One-step finite-difference time-domain algorithm to solve the Maxwell equations.

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Abstract

We present a one-step algorithm to solve the time-dependent Maxwell equations for systems with spatially varying permittivity and permeability. We compare the results of this algorithm with those obtained from the Yee algorithm and from unconditionally stable algorithms. We demonstrate that for a range of applications the one-step algorithm may be orders of magnitude more efficient than multiple time-step, finite-difference time-domain algorithms. We discuss both the virtues and limitations of this one-step approach.

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