An Unconditionally Stable Split-Step FDTD Method for Low Anisotropy

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Abstract:

Split-step unconditionally stable finite-difference time-domain (FDTD) methods have higher dispersion and anisotropic errors for large stability factors. A new split-step method with four sub-steps is introduced and shown to have much lower anisotropy compared with the well known alternating direction implicit finite-difference time-domain (ADI-FDTD) and other known split step methods. Another important aspect of the new method is that for each space step value there is a stability factor value that the numerical propagation phase velocity is isotropic.

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