Abstracts

A finite-difference time-domain method without the Courant stability conditions

In this paper, a finite-difference time-domain method that is free of the constraint of the Courant stability condition is presented for solving electromagnetic problems. In it, the alternating direction implicit (ADI) technique is applied in formulating the finite-difference time-domain (FDTD) algorithm. Although the resulting formulations are computationally more complicated than the conventional FDTD, the proposed FDTD is very appealing since the time step used in the simulation is no longer restricted by stability but by accuracy. As a result, computation speed can be improved. It is found that the number of iterations with the proposed FDTD can be at least three times less than that with the conventional FDTD with the same numerical accuracy.

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