Abstracts

A new FDTD algorithm based on alternating-direction implicit method

T. Namiki. "A new FDTD algorithm based on alternating-direction implicit method." 1999 Transactions on Microwave Theory and Techniques 47.10 (Oct. 1999 [T-MTT]): 2003-2007.

In this paper, a new finite-difference time-domain (FDTD) algorithm is proposed in order to eliminate the Courant-Friedrich-Levy (CFL) condition restraint. The new algorithm is based on an alternating-direction implicit method. It is shown that the new algorithm is quite stable both analytically and numerically even when the CFL condition is not satisfied. Therefore, if the minimum cell size in the computational domain is required to be much smaller than the wavelength, this new algorithm is more efficient than conventional FDTD schemes in terms of computer resources such as central-processing-unit time. Numerical formulations are presented and simulation results are compared to those using the conventional FDTD method.

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