Abstracts

Dispersion and asymmetry effects of ADI-FDTD

M. Darms, R. Schuhmann, H. Spachmann and T. Weiland. "Dispersion and asymmetry effects of ADI-FDTD." 2002 Microwave and Wireless Components Letters 12.12 (Dec. 2002 [MWCL]): 491-493.

In this paper, a generalized derivation of the alternating direction implicit finite-difference time-domain algorithm based on operator splitting is proposed. The formulation follows the notation of the finite integration technique. A straightforward proof of stability is given and the numerical dispersion formula is presented and verified by numerical experiments. As an additional parasitic effect, the asymmetric behavior of the algorithm even for exactly symmetric setups is revealed. Both the dispersion error and the asymmetry error are discussed in terms of the applicability of ADI for low-frequency problems.

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