

Multi split-step unconditionally stable finite difference time domain methods

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Abstract

New unconditionally stable split-step FDTD methods with 6 and 8 split-steps are introduced. A new definition of the stability factor is used for fair comparison of multi split-step methods, which takes into account the number of split-steps as well. When different methods are compared, on equal time basis using this definition, it is found that the new methods have the best dispersion error performance. Dispersion performances of some of the previously reported “improved” multi split-step FDTD methods do not seem to be as good as claimed. It has also been shown that for each space step value, the new methods have zero anisotropic error at certain large stability factor (time step) values. © 2009 Wiley Periodicals, Inc. *Microwave Opt Technol Lett* 51: 2646–2649, 2009; Published online in Wiley InterScience (www.interscience.wiley.com). DOI 10.1002/mop.24704