Abstracts

An unconditionally stable finite element time domain solution of active nonlinear microwave circuits using perfectly matched layers

Hsiao-Ping Tsai, Yuanxun Wang and Tatsuo Itoh. "An unconditionally stable finite element time domain solution of active nonlinear microwave circuits using perfectly matched layers." 2001 MTT-S International Microwave Symposium Digest 01.3 (2001 Vol. III [MWSYM]): 2059-2062 vol.3.

This paper proposes an extension of the unconditionally stable finite element time domain (FETD) method for the global electromagnetic analysis of active microwave circuits. This formulation has two advantages. First, the time step size is no longer governed by the spatial discretization of the mesh, but rather by the Nyquist sampling criterion. Second, the implementation of the truncation by the perfectly matched layers is straightforward. A benchmark test on a microwave amplifier indicates that this extended FETD algorithm is not only superior than FDTD-based algorithm in mesh flexibility and simulation accuracy, but also reduces computation time dramatically.

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