Abstracts

Implicit Incorporation of Nonlinear Elements for Unconditionally Stable FDTD Analysis at Coarse Time-Steps

M. Celuch-Marcysiak and W.K. Gwarek. "Implicit Incorporation of Nonlinear Elements for Unconditionally Stable FDTD Analysis at Coarse Time-Steps." 1996 MTT-S International Microwave Symposium Digest 96.3 (1996 Vol. III [MWSYM]): 1381-1384.

A hybrid 3D FDTD algorithm with a fully implicit interface to lumped nonlinear multiport devices is presented. The algorithm is unconditionally stable and converges for arbitrarily strong nonlinearities, high voltages and with any time-step satisfying the Courant condition. In case of a strongly nonlinear bipolar transistor, the new algorithm is by over two orders of magnitude faster than previous FDTD schemes with explicit or semi-implicit interfaces.

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