Abstracts

Absorbing-boundary conditions using perfectly matched-layer (PML) technique for three-dimensional TLM simulations

N. Pena and M.M. Ney. "Absorbing-boundary conditions using perfectly matched-layer (PML) technique for three-dimensional TLM simulations." 1997 Transactions on Microwave Theory and Techniques 45.10 (Oct. 1997, Part I [T-MTT]): 1749-1755.

This paper describes the algorithm that interfaces the three-dimensional (3-D) transmission-line matrix (TLM) with an absorbing-boundary condition (ABC) based on the perfectly matched-layer (PML) approach. The algorithm uses a coupling between the TLM symmetrical condensed node (SCN) network and a finite-difference approximation of the PML equations. Examples are presented in scattering problems and S-parameter characterization of discontinuities. Excellent results are found even with absorbing walls located in the region of evanescent waves. Absorption performances obtained are significantly superior to ABC's based on the one-way equation approach and currently used for TLM simulations. Finally, it is found that for all tested situations, the algorithm is numerically stable.

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