Abstracts

Extending PML absorbing boundary condition to truncate microstrip line in nonuniform 3D FDTD grid

Tong Li and Wenquan Zhou. "Extending PML absorbing boundary condition to truncate microstrip line in nonuniform 3D FDTD grid." 1999 Transactions on Microwave Theory and Techniques 47.9 (Sep. 1999, Part II [T-MTT] (Special Issue on Multilayer Microwave Circuits)): 1771-1776.

The Berenger's perfectly matched layer (PML) absorbing boundary condition is applied to terminate a microstrip line with metal strip and multilayer dielectric media extending into the PML regions. In order to handle the inhomogeneous properties of the PML layers better, the integral form of the Maxwell's equations, approximated by central-difference expressions instead of exponential-difference expressions, are utilized to deduce the finite-difference time-domain (FDTD) equations for updating field components inside PML media. The derived formulas are proven to be flexible and convenient for generating and handling the PML layers in a nonuniform FDTD grid. Simulation results show that the proposed multilayer PML boundary condition can effectively absorb the outgoing wave with at least -80-dB reflection coefficient under a complicated boundary situation.

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