Abstracts

Stability Considerations in the Application of PML Absorbing Boundary Condition to FDTD Simulation of Microwave Circuits

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Berenger introduced the concept of a terminating boundary known as perfectly matched layer (PML), in which electromagnetic waves are absorbed without reflection, irrespective of frequency and angle of incidence of the incoming wave. This absorbing boundary condition promises to be very attractive for microwave CAD applications involving complex geometries such as high-density microwave integrated circuits and electronic packages, because the computational domain can be significantly reduced. This paper presents, for the first time, a rigorous analysis of the stability of the PML boundary condition applied to finite-difference time-domain (FDTD) simulation. We discuss the FDTD simulation of a high-Q microstrip filter to show improvement in computational efficiency without any manifestation of instability.

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