Abstracts

Development of an unconditionally stable full-wave 2D ADI-FDTD method for analysis of arbitrary waveguiding structures

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This paper presents the development of unconditionally stable full-wave 2D ADI-FDTD method for analysis of characteristics of arbitrary uniform waveguiding structures. The method is derived by assuming the field variation of e/sup -j/spl beta/z/ along the z-direction and multiplying the field equations with an additional factor j In the recently developed 3-dimensional ADI-FDTD algorithm. In difference from the conventional full-wave 2D FDTD, it does not require that the time step be bounded by the stability condition. As a result, much CPU time and memory can be saved. The dispersion relation of the method is also presented and is used to determine effects of discretization parameters on the accuracy. To validate the method, a boxed microstrip line on an anisotropic sapphire substrate is calculated and the results are compared with those obtained with other methods.

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