Abstracts

Some Considerations on the Accuracy of the Nonuniform FDTD Method and its Application to Waveguide Analysis When Combined with the Perfectly Matched Layer Technique

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The accuracy of the finite-difference time-domain (FDTD) technique is measured with respect to the mesh's cell dimensions. The accuracy of the FDTD technique is investigated for those applications that demand the use of nonuniform meshes. The results of simulations suggest that second-order accuracy can be achieved. These simulations are carried out using different boundary conditions. It is observed that the choice of boundary conditions plays a large role in the accuracy that is achieved with the FDTD method, The perfectly matched layer (PML) technique is found to be well suited to waveguide analysis because of its wide bandwidth, and the ease with which it can be implemented with a nonuniform mesh. We apply the nonuniform FDTD method, in combination with the PML technique, to analyze a narrow iris in waveguide.

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