Abstracts

Generalized-scattering-matrix modeling of waveguide circuits using FDTD field simulations

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This paper presents a hybrid-analysis method for metal waveguide structures. The method is based on the generalized-scattering-matrix approach. The whole structure is divided into several components, each of which is characterized independently. Some components are analyzed using the finite-difference time-domain (FDTD) method, while the others are characterized analytically. For the FDTD simulations, we introduce a new technique for efficient and rigorous calculation of the scattering parameters. This hybrid method inherits the universality of the FDTD method and enables us to analyze larger and more complex structures using limited computer resources compared to the single FDTD analysis of a whole structure. A few results are given as examples to illustrate the validity of the method.

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