Abstracts

The generalized TLM-based FDTD modeling of frequency-dependent and anisotropic media

Z. Chen and J. Xu. "The generalized TLM-based FDTD modeling of frequency-dependent and anisotropic media." 1998 Transactions on Microwave Theory and Techniques 46.5 (May 1998, Part I [T-MTT]): 561-565.

A generalization of the previously proposed transmission-line matrix (TLM)-based finite-difference time-domain (FDTD) method is presented for modeling frequency-dependent and anisotropic media. The generalized scheme incorporates electric- and magnetic-flux densities in addition to variable mesh sizes. Since it is in an FD form, modeling techniques developed for the conventional FDTD can be easily adapted into the proposed TLM-based technique. In this paper, a modified z-transform technique for frequency-dependent media is implemented, and a two-dimensional (2-D) full-wave technique for guided-wave structures is developed. In all the FDTD computations, no conversions between the field quantities and TLM circuit parameters such as open- and short-circuited stubs are required.

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