Abstracts

Multimode parameter extraction for multiconductor transmission lines via single-pass FDTD and signal-processing techniques

Yuanxun Wang and Hao Ling. "Multimode parameter extraction for multiconductor transmission lines via single-pass FDTD and signal-processing techniques." 1998 Transactions on Microwave Theory and Techniques 46.1 (Jan. 1998 [T-MTT]): 89-96.

We present two approaches to extract the broadband multimode parameters of guided wave structures from a single-pass finite-difference time-domain (FDTD) simulation. They include a two-dimensional (2-D) Fourier transform (FT) algorithm and a super-resolution estimation of signal parameters via rotational invariance technique (ESPRIT) algorithm. Comparison is made to show the superiority of the super-resolution approach. As a typical application, a three-line coupled microstrip structure is studied. After a single-pass FDTD simulation, broadband multimode parameters such as propagation constants, modal-field templates, and modal impedances are extracted and verified against published data obtained by the spectral-domain method. The main feature of this parameter-extraction methodology is that it decouples the computational electromagnetics engine (in this case, the FDTD simulator) from the post-processing parameter-extraction algorithm, thus providing more flexibility and connectivity among the various simulation tools.

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