# Abstracts

## TFDTLM-a new computationally efficient frequency-domain transmission-line-matrix method

*I. Salama and S.M. Riad. "TFDTLM-a new computationally efficient frequency-domain transmission-line-matrix method." 2000 Transactions on Microwave Theory and Techniques 48.7 (Jul. 2000, Part I [T-MTT]): 1089-1097.*

In this paper, a new computationally efficient frequency-domain transmission-line matrix (FDTLM) approach is introduced. The new approach combines the superior features of both the time- and the frequency-domain transmission-line matrix (TLM). It is based on a steady-state analysis in the frequency domain using transient analysis techniques and, hence, is referred to as the transient frequency-domain transmission-line matrix (TFDTLM). On the contrary, of all other frequency-domain techniques, the TFDTLM has the advantage of being able to extract all the frequency-domain information in the frequency range of interest from only one simulation. This special feature of the TFDTLM makes it computationally more efficient as compared to any other FDTLM method. The TFDTLM employs digital filter approximations for modeling wave propagation in inhomogeneous frequency dispersive media. The filters can be thought of as some type of compensation equivalent to the stubs in a time-domain transmission-line matrix (TD TLM), yet more accurate and more capable of modeling a wide variety of frequency-dependent material parameters. In addition, the TFDTLM has proven to have superior dispersion behavior in modeling lossy inhomogeneous media as compared to the TD TLM.

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