Abstracts

Transient Analysis of Coupled, Tapered Transmission Lines with Arbitrary Nonlinear Terminations

K.S. Oh and J.E. Schutt-Aine. "Transient Analysis of Coupled, Tapered Transmission Lines with Arbitrary Nonlinear Terminations." 1993 Transactions on Microwave Theory and Techniques 41.2 (Feb. 1993 [T-MTT]): 268-273.

In this paper, a fast and efficient method to simulate the time-domain transient response of coupled, tapered transmission lines is presented. A time-domain scattering parameter formulation is used to derive the simple closed-form expression for the voltage variables for uniform lossless lines; then, this expression is applied to tapered lines by dividing the lines into many uniform sections. Computational efficiency and stability are achieved using recursive time-domain algorithms. The method that assumes a quasi-TEM mode of propagation is applicable to nonlinear terminations and inhomogeneous dielectric media. Memory requirement is minimized and is independent of the number of time steps. Simulation results when compared with experimental simulations indicated a good level of agreement.

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