Abstracts

Equivalence of Propagation Characteristics for the Transmission-Line Matrix and Finite-Difference Time-Domain Methods in Two Dimensions (Short Papers)

N.R.S. Simons and E. Bridges. "Equivalence of Propagation Characteristics for the Transmission-Line Matrix and Finite-Difference Time-Domain Methods in Two Dimensions (Short Papers)." 1991 Transactions on Microwave Theory and Techniques 39.2 (Feb. 1991 [T-MTT]): 354-357.

In previous papers an equivalence between the TLM and FD-TD methods has been established by altering the definitions of field components and operation of the TLM algorithm such that the appropriate finite-difference expressions are satisfied. In this paper the equivalence of propagation characteristics for the TLM and FD-TD methods in two dimensions is discussed. Propagation analysis of a TLM shunt node complete with permittivity and loss stubs, and dispersion analysis of the two-dimensional FD-TD method in an arbitrary medium are performed and yield dispersion relations. The relations are identical when the FD-TD method is operated at the upper limit of its stability range.

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