Abstracts

A New Boundary Description in Two-Dimensional TLM Models of Microwave Circuits

In this paper, we describe a new boundary representation for the two-dimensional transmission line matrix method of numerical analysis (TLM). In conventional TLM simulations, boundary conditions are realized by introducing the appropriate impulse reflection coefficients halfway between two nodes. Since the total field quantities are defined on the nodes, their values at the boundary are not directly available from TLM solutions. We have thus modified the TLM procedure so that boundaries can be placed across the nodes. The boundary conditions in TLM can then be formulated in terms of the field boundary conditions derived from Maxwells equations, rather than in terms of impulse reflection coefficients, The essential differences between the conventional TLM and our proposed procedure are presented. Examples are given for several typical problems, and the results obtained with the two methods are compared. These were found to be in excellent agreement.

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