Abstracts

Theory of the Symmetrical Super-Condensed Node for the TLM Method

V. Trenkic, C. Christopoulos and T.M. Benson. "Theory of the Symmetrical Super-Condensed Node for the TLM Method." 1995 Transactions on Microwave Theory and Techniques 43.6 (Jun. 1995 [T-MTT]): 1342-1348.

This paper describes a novel time-domain node for the TLM method. It has the unique feature of modeling arbitrary inhomogeneous media on a generally graded rectangular TLM mesh without using stubs. Variations in material properties and arbitrary aspect ratios of mesh cells are modeled by allowing different characteristic impedances in a cell, maintaining impulse synchronism throughout the mesh. The complete theory of the new node is given and its implementation on a general TLM mesh is discussed. Numerical results for a canonical resonator loaded with dielectric layers are presented for different grading cases. Substantial savings in computer storage and run-time as well as improved accuracy compared to the uniform mesh are achieved when an appropriate nonuniform grading of the TLM mesh is used.

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