Abstracts

New TLM Algortitims with Controlled Stability Margin and Their Application to Improve the Modelling of Curved Boundaries

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In this work new TLM formulations based on 2D shunt node and 3D expanded node are proposed. In comparison with standard TLM algorithms based on the same discretization of space, the new algorithms can use longer or shorter time-steps. This corresponds to operating with decreased (family r/sup -/) or increased (family r/sup +/) numerical stability margin. Stable algorithms of family r/sup -/ exist for the 3D expanded node, and they reduce numerical dispersion errors as well aa computation time of standard TLM. Algorithms of family r/sup +/ can incorporate enhanced TLM models for curved boundaries. We propose one such a model herein. In many practical cases application of the new boundary model reduces computer resources required for the TLM analysis of irregularly shaped microwave circuits by an order of magnitude.

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