Abstracts

Modification of the 3D-TLM scattering matrix to model nonlinear devices in graded and heterogeneous regions

In this paper we propose a modification of the TLM stub-loaded SCN scattering matrix to analyze three-dimensional problems including nonlinear active and passive devices in graded and heterogeneous regions. The nonlinear behavior of the lumped circuit is decoupled from the impulse scattering at the nodes, yielding a general and systematic methodology to embed arbitrary nonlinear devices into the TLM mesh. The method has been validated for both one-dimensional examples with traditional CAD circuit simulators (SPICE) and 3D problems. The modeling results have been compared with measurements available in the literature.

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