Abstracts

SFELP-an efficient methodology for microwave circuit analysis

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A hybrid method based on the segmentation technique, the finite-element method, and a matrix Lanczos-Pade algorithm (SFELP) for the analysis of microwave circuits is introduced in this paper. This method computes symmetric matrix-Pade approximations of a matrix transfer function for any number of inputs and outputs via a Lanczos-type process (SyMPVL) for obtaining the generalized admittance matrix of a microwave circuit on a wide band of frequencies. The formulation that provides the three-dimensional finite-element/segmentation method is suitable for applying the symmetric Pade via Lanczos algorithm, except for the frequency dependence of the matrix of excitation vectors. In this paper, this problem is analytically overcome for the case in which excitation vectors correspond to modes of homogeneous waveguides or transmission lines. The accuracy and efficiency of the proposed method are shown by means of different examples.

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