Abstracts

Full-wave segmentation analysis of arbitrarily shaped planar circuit

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This paper presents a novel full-wave segmentation method for analyzing a complex and large microwave planar circuit which is divided into several smaller segments with corresponding multiport network parameters. They are obtained by a full-wave space-domain integral-equation technique in connection to a proposed excitation model based on the equivalence principle. The integral equation is solved numerically by Galerkin's procedure resulting in the generalized scattering-matrix (GSM) descriptions of all the subcircuit segments. The combination of these GSM's yields an overall network characterization of the composite circuit. Rigorous convergence studies and extensive validity checks confirm the reliability and accuracy of the proposed method. The novel technique immediately demonstrates its obvious application for quantitative characterization of higher order modes associated with a microwave-circuit discontinuity problem. Finally, very good agreement is obtained in a comparative study of an arbitrary planar structure analyzed by our full-wave method with and without segmentation, respectively.

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