Abstracts

A generalized space-mapping tableau approach to device modeling

J.W. Bandler, N. Georgieva, M.A. Ismail, J.E. Rayas-Sanchez and Q.-J. Zhang. "A generalized space-mapping tableau approach to device modeling." 2001 Transactions on Microwave Theory and Techniques 49.1 (Jan. 2001 [T-MTT] (Mini-Special Issue on 2000 Radio-Frequency Integrated Circuits (RFIC) Conference and Automatic Radio Frequency Techniques Group (ARFTG) Meeting)): 67-79.

A comprehensive framework to engineering device modeling, which we call generalized space mapping (GSM) is introduced in this paper. GSM permits many different practical implementations. As a result, the accuracy of available empirical models of microwave devices can be significantly enhanced. We present three fundamental illustrations: a basic space-mapping super model (SMSM), frequency-space-mapping super model (FSMSM) and multiple space mapping (MSM). Two variations of MSM are presented: MSM for device responses and MSM for frequency intervals. We also present novel criteria to discriminate between coarse models of the same device. The SMSM, FSMSM, and MSM concepts have been verified on several modeling problems, typically utilizing a few relevant full-wave electromagnetic simulations. This paper presents four examples: a microstrip line, a microstrip right-angle bend, a microstrip step junction, and a microstrip shaped T-junction, yielding remarkable improvement within regions of interest.

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