Abstracts

Order-Recursive Gaussian Elimination (ORGE) and Efficient CAD of Microwave Circuits

Planar circuit elements in millimeter-wave integrated circuits (MMIC's) typically consist of one or more discontinuities (e.g., stubs) connected to a number of transmission lines. In the computer-aided design (CAD) and optimization of such passive elements using the method of moments, it is necessary to iteratively simulate many subproblems involving dimensional changes to various parts of the circuit. On examining the simulation problem closely, it can be seen that there is a considerable overlap of data in various subproblems. In practice, each subproblem is solved independent of others, without taking into account the duplication of data. This leads to an inefficient design technique. In this paper, we present a design technique that effectively exploits the duplication of data by employing a recursive variant of Gaussian elimination, called order-recursive Gaussian elimination (ORGE). The potential utility of ORGE in microwave circuit simulation and CAD is demonstrated by applying it to the design of a microstrip filter.

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