Abstracts

Order Recursive Method of Moments (ORMoM) for Iterative Design Applications

The method of moments (MoM) continues to be the most frequently used full-wave electromagnetic simulation technique for application to CAD and optimization of microwave circuits. In this paper, we present an order-recursive variant of standard LU decomposition for the efficient solution of moderately large linear systems arising in the application of MoM to iterative design problems. In comparison with the existing solution methods suitable to matrices of size such that direct resolution of the linear systems by Gaussian elimination or LU decomposition becomes feasible, the proposed order-recursive MoM (ORMoM) allows a very large portion of repetitive computations (from scratch) at each design iteration to be avoided, leading to extremely efficient design cycles. Specifically, it is shown that ORMoM results in an order of magnitude reduction in the solution time for typical microwave design tasks. Therefore, this contribution is a major advance toward EM simulation-based CAD and optimization of microwave circuits.

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