Abstracts

Correction procedures for the numerical parasitic elements associated with lumped elements in global electromagnetic simulators

R. Gillard, S. Dauguet and J. Citerne. "Correction procedures for the numerical parasitic elements associated with lumped elements in global electromagnetic simulators." 1998 Transactions on Microwave Theory and Techniques 46.9 (Sep. 1998 [T-MTT]): 1298-1306.

This paper presents a comparative study of the treatment of lumped elements in two different full-wave electromagnetic formulations: the finite-difference time-domain (FDTD) technique and the technique of integral equations. Although these two approaches are basically different, they are seen to exhibit the same kind of numerical troubles when lumped elements are involved. More precisely, lumped elements are systematically associated with numerical parasitic elements that can seriously alter the calculated results. As a solution, this paper proposes a general alternative formulation, which permits one to suppress these numerical parasites. This formulation is successfully applied to the FDTD technique. A simpler numerical deembedding procedure, which does not fundamentally transform the original formulation, is preferred for the integral-equation technique.

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