Abstracts

Fast parameter extraction of general interconnects using geometry independent measured equation of invariance

W. Sun, W. Wei-Ming Dai and Wei Hong. "Fast parameter extraction of general interconnects using geometry independent measured equation of invariance." 1997 Transactions on Microwave Theory and Techniques 45.5 (May 1997, Part II [T-MTT]): 827-836.

The measured equation of invariance (MEI) is a new concept in computational electromagnetics. It has been demonstrated that the MEI technique can be used to terminate the meshes very close to the object boundary and still strictly preserves the sparsity of the finite-difference (FD) equations. Therefore, the final system matrix encountered by the MEI is a sparse matrix with a size similar to that of integral equation methods. However complicated the Green's function, disagreeable Sommerfeld integrals, and very difficult umbilical meshes for multiconductors make the traditional MEI very difficult (if not impossible) to be applied to analyze multilayer and multiconductor interconnects. In this paper, the authors propose the geometry independent MEI (GIMEI) which substantially improves the original MEI method. The authors use GIMEI for capacitance extraction of general two-dimensional (2-D) and three-dimensional (3-D) very large scale integration (VLSI) interconnect. numerical results are in good agreement with published data and those obtained by using FASTCAP from Massachusetts Institute of Technology (MIT) and some other commercial tools, while GIMEIs are generally an order of magnitude faster than FASTCAP with much less memory usage.

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