论文

渐近波形估计技术加速的频域有限差分法

梁建, 洪伟

东南大学毫米波国家重点实验室 南京 210096

摘要
本文提出了一种基于三维频域有限差分法(3D-FDFD)和渐近波形估计技术(AWE)计算三维微波结构S参数的快速算法。在分析中, 将输入和输出端口的电场分别展开成某抽样频率点处的泰勒级数, 通过Padé逼近及奇异值分解技术求出电场与频率的有理函数解析表达式, 从而获得频带内的S参数。数值计算结果与已有结果吻合良好, 并且与传统FDFD法相比, 计算效率提高很多。

关键词　　频域有限差分法　　渐近波形估计　　波导不连续性　　散射参数

分类号　O441

扩展功能

本文信息

▸ Supporting info
▸ PDF(1083KB)
▸ [HTML全文](0KB)
▸ 参考文献[PDF]
▸ 参考文献

服务与反馈

▸ 把本文推荐给朋友
▸ 加入我的书架
▸ 加入引用管理器
▸ 复制索引
▸ Email Alert
▸ 文章反馈
▸ 浏览反馈信息

相关信息

▸ 本刊中 包含"频域有限差分法"的相关文章
▸本文作者相关文章

· 梁建
· 洪伟

A FAST 3D-FDFD METHOD IN CONJUCTION WITH ASYMPTOTIC WAVEFORM EVALUATION TECHNIQUE

Liang Jian, Hong Wei

State Key Lab., of Millimeter Waves Southeast University Nanjing 210096

Abstract

A fast generalized algorithm for S parameter extraction of 3-D microwave structures is presented based on the 3-D FDFD (Frequency Domain Finite Difference) method in conjunction with the asymptotic waveform evaluation (AWE) technique.In the AWE technique,the electric field strength at the input and output ports are respectively expanded in a Taylor's series around a frequency within the desired frequency band,and the coefficients of the Taylor's series are matched via the Padé approximation to a rational function and the robust Singular Value Decomposition (SVD) technique is employed while solving the Padé equation.Using the rational function,the electric field strengths at the input and output are obtained at any frequency within the desired frequency band,which is used to calculated the S parameter.A good agreement between the numerical results and the reported data is observed.Compared with the traditional FDFD,the computational efficiency of the present method is considerably improved.

Key words　FDFD　AWE　Waveguide discontinuities　Scattering parameters

DOI :

通讯作者

作者个人主页　梁建; 洪伟