论文

理想导电柱体电磁散射的有限差分法

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摘要
本文提出一种新的求解二维电磁散射的数值方法。应用辐射边界条件将无限大空间的电磁散射问题限制在有限区域内, 采用有限差分技术数值求解波动方程、辐射边界条件及散射体表面边界条件, 从而获得理想导电二维散射体的表面感应电流及近场分布。本文给出的圆形、椭圆形及方形截面柱体的数值计算实例表明, 这种方法可获得与本征函数级数解或矩量法解相当吻合的结果, 大大优于表面辐射条件法的结果, 表明这种方法可能成为代替现有解析或数值方法的有效方法。
关键词　　电磁散射　辐射边界条件　有限差分法
分类号

FINITE DIFFERENCE METHOD FOR EM SCATTERING FROM PERFECT CONDUCTING CYLINDERS

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Abstract
A new numerical method for electromagnetic scattering by two-di-mensional bodies is presented. Radietion boundary condition (RBC) is applied to confint electromagnetic scanering problem in infinite spice to finite space. Coupled with RBC and cylinder surface boundary condition, Helmboltz equation in the finite region is solved numrically by the finite difference method. Thus the distribution of induced surface carrents on perfect conducting cylinder and near ficlds can be obtained. Computational results for both polarizations of cirrular, elliptical and square by the eigenfunction expansion method or moment method and much better than the results of OSRC method. This method may be a valid alternative to the traditional analytical and numerical methods.
Key words　Electromagnetic scattering　Radiation boundary condition　Finite difference method

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