

## 论文

### 三维电大问题的辅助激励源区域分解算法

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摘要:

针对三维电大问题, 提出了一种基于辅助激励源的区域分解算法. 将原求解区域划分成互不重叠的子区域以降低计算复杂度. 通过引入Robin类型的辅助激励源, 使相邻子区域之间的信息交换仅限于其分界面上, 消除了“内谐振”现象. 根据矢量有限元方法独立地处理每个子区域, 建立了原问题的粗问题. 对于具有几何重复性特征的有限周期结构, 引入了基本子区域, 有效地提高了计算效率.

关键词: 区域分解算法 矢量有限元 辅助激励源 有限元分裂与互连 有限周期结构

### Auxiliary excitation algorithm of the domain decomposition method for 3-D large-scale electromagnetic problems

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Abstract:

A novel domain decomposition method (DDM) without resonance based on an auxiliary excitation algorithm is developed for the simulation of three-dimensional (3-D) large-scale electromagnetic problems. To decrease the computational scale and complexity, the original domain is partitioned into several nonoverlapping subdomains. A set of Robin-type auxiliary excitations on the inter-domain interfaces has been introduced to exchange information between subdomains. Because each subdomain can be tackled independently with the vector finite element method, the originally large problem is reduced to a much smaller interface problem. The proposed method becomes very efficient for finite periodic problems by introducing basic subdomains to describe the geometric repetitions.

Keywords: domain decomposition method vector finite element method auxiliary excitation finite element tearing and interconnecting (FETI) finite periodic structure

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