

## 研究论文

### 奇异系统的无源性补偿算法

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#### 摘要:

针对现有的奇异系统无源性补偿算法都需要系统分解, 仿真时间较长的问题, 提出了一种快速的无源性补偿方法. 通过扰动状态方程的参数值构建目标函数和约束函数以形成二次规划问题, 利用拉格朗日乘数法, 将复杂的数值优化求解问题转变为简单的线性方程组求解问题, 提高了仿真效率. 数值例子表明, 该方法在有限的仿真时间内精确补偿了宏模型的无源性.

关键词: 奇异系统 无源性 二次规划

### Passivity enforcement scheme for descriptor systems

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#### Abstract:

For the macromodel in descriptor systems, the existing methods require system decomposition, which greatly increase the computational time. A fast and efficient perturbation method is proposed for the passivity enforcement of S-parameter descriptor systems. The method generalizes quadratic programming with equality constraint introduced for regular systems which makes full use of matrix sparsity. It is implemented by perturbing some parameters of the DS to construct the objective function and constraint function of the quadratic programming problem. By using Lagrange multipliers, the complex optimization problem is transformed to a linear system solution, which greatly increases simulation efficiency. Numerical examples are presented to demonstrate the validity and efficiency of the proposed algorithm.

Keywords: descriptor system passivity quadratic programming

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