数学与系统科学研究院

计算数学所学术报告

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报告题目：

Gauged dual formulations for fast and accurate computation of inductance parameters

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报告地点： 科技综合楼三层

301 小报告厅

Abstract：

Dual formulations are highly useful for computing energy-related quantities such as inductances, capacitances and losses. This method can guarantee the extracted parameters with high accuracy by giving a pair of upper and lower bounds to the true solution. However the global finite element matrices of most dual formulations are not relevant due to totally different control equations and types of finite element spaces, which makes the dual formulations difficult in use and increases thecomputational cost. In this work, new dual formulations for magnetostatic problems are proposed using either the magnetic vector potential or the magnetic field as unknown variables. For linear problems, the resultant coefficient matrices are exactly the same for both formulations, only the right hand side vectors are different which can be assembled with very little cost. This unique feature offers significant advantages when using direct linear solvers since the sparse matrix only need to be factorized once. An artificial problem and two practical inductance extraction examples are demonstrated to showcase the accuracy and effectiveness of the proposed formulations.

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