

数学与系统科学研究院

计算数学所学术报告

报告人: 阳莺 教授

(桂林电子科大)

报告题目:

**Some Numerical Methods for
Improving the Efficiency of Finite
Element Method for
Poisson-Nernst-Planck Equations**

邀请人: 卢本卓 研究员

报告时间: 2018 年 8 月 16 日 (周四)

上午 10:00-11:00

报告地点: 数学院南楼七层

702 教室

Abstract:

In this talk, we discuss three numerical methods for improving the accuracy of the finite element method for Poisson-Nernst-Planck equations. Poisson-Nernst-Planck equations (PNP) are coupled, nonlinear and singular partial differential equations and widely used to describe the electrodiffusion of ions in a solvated biomolecular system. We first introduce a two-grid decoupling method for time-dependent PNP equations. Compared with the finite element method, this decoupling method can save lots of CPU time. Then we show some superconvergence results for both PNP equations and modified nonlinear PNP equations by using the gradient recovery technique. These results are applied to improving the accuracy of the finite element method for PNP systems. Numerical results show the extern iteration can converge much fast if the gradient recovery technique is applied during the computation procedure. At last, we present two types of the a posteriori error estiamtes for PNP equations and corresponding adaptive finite element method.

欢迎大家参加！