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：

High order energy stable and efficient local discontinuous Galerkin methods for the phase field models

邀请人：　明平兵 研究员

报告时间：**2017** 年 **3** 月 **7** 日（周二）

上午 **10:00-11:00**

报告地点：　数学院南楼二层

202 教室

Abstract:

The goal of this talk is to propose two energy stable fully discrete local discontinuous Galerkin (LDG) nite element methods for the phase field models. Based on the method of lines, we rst construct an LDG method and prove the semi-discrete energy stability. Then, we develop a first order and a second order semi-implicit convex splitting schemes based on a convex splitting principle of the discrete Cahn-Hilliard energy, and prove the corresponding unconditional energy stabilities. In addition, a semiimplicit spectral deferred correction (SDC) method combining the first order convex splitting scheme is employed to improve the temporal accuracy. The SDC method is high order accurate and stable numerically with the time step proportional to the spatial mesh size. The resulting algebraic equations at the implicit level are nonlinear. Due to the local properties of the LDG methods,the resulting implicit scheme is easy to implement and can be solved in an explicit way when it is coupled with iterative methods. An efficient nonlinear multigrid method are used to solve the equations. Numerical experiments of the accuracy and long time simulations are presented to illustrate the high order accuracy in both time and space, the capability and efficiency of the proposed methods.

欢迎大家参加！