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：

Energy stable fourth order finite difference scheme for the Cahn-Hilliard equation

邀请人： 谢和虎 研究员

报告时间：2018 年 8 月 10 日（周五）

上午 **10:00-11:00**

报告地点： 科技综合楼三层

311 报告厅

Abstract：

An energy stable numerical scheme for the Cahn-Hilliard equation is proposed and analyzed, with second order accuracy in time and the fourth order finite difference approximation in space. In particular, the truncation error for the long   stencil fourth order finite difference approximation is estimated,   over a uniform numerical grid with a periodic boundary condition, via the help of discrete Fourier analysis instead of the the standard Taylor expansion. This in turn results in a reduced regularity requirement for the test function. In the temporal approximation, we apply a second order BDF stencil, combined with a second order extrapolation formula applied to the concave diffusion term, as well as a second order artificial Douglas-Dupont regularization term, for the sake of energy stability. As a result, the unique solvability, energy stability are established for the proposed numerical scheme, and an optimal rate convergence analysis is derived. A few numerical experiments are also presented in this talk.

欢迎大家参加！