数学与系统科学研究院

计算数学所学术报告

报告人： **Prof. Cheng Wang**

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报告题目：

A positivity-preserving, energy stable numerical scheme for the Cahn-Hilliard equation with logarithmic potential

邀请人： 谢和虎 研究员

报告时间：**2019** 年 **1** 月 **2** 日（周三）

上午 **10:00-11:00**

报告地点： 科技综合楼三层

311 报告厅

Abstract:

The Cahn-Hilliard model with logarithmic potential is considered, in which the key difficulty has always been associated with the singularity of the logarithmic terms. An energy stable finite difference scheme, which implicitly treats the logarithmic terms, is proposed and analyzed in this talk. In particular, how to ensure the positivity of the logarithmic arguments, so that the numerical scheme is well-defined at a point-wise level, has been a long-standing mathematical challenge. It is proved that, given any numerical solution with a fixed bound at the previous time step, there exists a unique numerical solution that satisfies the given bound (-1,1) at a point-wise level. As a result, the numerical scheme is proven to be well-defined, and the unique solvability and energy stability could be established with the help of convexity analysis. In addition, an optimal rate convergence analysis could be appropriately established. Some numerical results are also presented in the talk.

欢迎大家参加！