

数学与系统科学研究院

计算数学所学术报告

报告人：蔡勇勇 助理教授

(北京计算科学研究中心 (CSRC))

报告题目：

**A stable scheme for a 2D dynamic
Q-tensor model of nematic liquid
crystals**

邀请人：于海军 副研究员

报告时间：2016 年 11 月 7 日 (周一)

下午 13:00-14:00

报告地点：科技综合楼三层

311 报告厅

Abstract:

We propose an unconditionally stable numerical scheme for a $2D$ dynamic Q -tensor model of nematic liquid crystals. This dynamic Q -tensor model is a L^2 gradient flow generated by the liquid crystal free energy that contains a cubic term, which is physically relevant but makes the free energy unbounded from below, and for this reason, has been avoided in other numerical studies. The unboundedness of the energy brings significant difficulty in analyzing the model and designing numerical schemes. By using a stabilizing technique, we construct an unconditionally stable scheme, and establish its unique solvability and convergence. Our convergence analysis also leads to, as a byproduct, the well-posedness of the original PDE system for the $2D$ Q -tensor model. Several numerical examples are presented to validate and demonstrate the effectiveness of the scheme.

欢迎大家参加！