

数学与系统科学研究院

计算数学所学术报告

报告人: Prof. Thomas Y. Hou

(California Institute of Technology)

报告题目: Recent Progress on
Dynamic Stability and Global
Regularity of 3D Incompressible
Euler and Navier–Stokes Equations

邀请人: 陈志明研究员

报告时间: 2009年9月11日(周五)

上午 10:00—11:00

报告地点: 科技综合楼三层 311

计算数学所报告厅

Abstract:

Whether the 3D incompressible Euler and Navier–Stokes equations can develop a finite time singularity from smooth initial data with finite energy has been one of the most long standing open questions. We review some recent theoretical and computational studies which show that there is a subtle dynamic depletion of nonlinear vortex stretching due to local geometric regularity of vortex filaments. Our studies also reveal a surprising stabilizing effect of convection for the 3D incompressible Euler and Navier–Stokes equations. Finally, we prove nonlinear stability and the global regularity of a class of solutions which exhibit interesting dynamic growth.

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