

**中国科学院数学与系统科学研究院
数学研究所
数学科学全国重点实验室**

非线性泛函分析研讨班

Speaker: 史峻平 教授 (College of William & Mary, USA)

Inviter: 张志涛

Language: English

Title : Bifurcation of rotating wave solutions in reaction-diffusion-advection systems with nonlocal reaction on a circle

Time&Venue: 2026 年 10 月 9 日 (星期五)

10:00-11:00 & 南楼 N820

Abstract: We investigate the existence and stability of rotating wave solutions for a general class of reaction-diffusion-advection systems with nonlocal reaction terms on a circle. By applying an abstract Hopf bifurcation theorem, we rigorously establish the existence of small-amplitude rotating waves bifurcating from spatially homogeneous steady states and identify their critical wave speeds. The stability of the bifurcating rotating waves is further characterized using center

manifold and normal form theory. We then apply the general theoretical framework to two biological models: the Klausmeier model for water-plant interactions and a Keller-Segel-type chemotaxis system. In both cases, we demonstrate how the general theory can be used to characterize the emergence and stability of rotating waves, and numerical simulations are provided to illustrate and validate the analytical results.