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SERIES

北京大学工学院

力学与工程科学系

湍流与复杂系统国家重点实验室

Zonostrophic instability

报告人: 王辰

北京师范大学（珠海校区）

时 间: 10月25日周五 16:00—17:00

地 点: 新奥工学大楼 3F - 3048 会议室

主持人: 谢金翰 助理教授

内容简介:

Zonal flows are mean flows in the east--west direction, which are ubiquitous on planets, and can be formed through ‘zonostrophic instability’: within turbulence or random waves, a weak large-scale zonal flow can grow exponentially to become prominent. In this work, we study the statistical behaviour of the zonostrophic instability and the effect of magnetic fields. We use a stochastic white noise forcing to drive random waves, and study the growth of a mean flow in this random system. The dispersion relation for the growth rate of the expectation of the mean flow is derived, with simple expressions in limits of strong and weak magnetic diffusivity. Numerical simulation of the stochastic flow is performed to confirm the theory. Results indicate that the magnetic field can significantly increase the randomness of the zonal flow.

报告人简介:

王辰博士于 2020 年在英属哥伦比亚大学获得应用数学博士学位，指导教师为 Neil Balmforth 教授。随后在英国埃克塞特大学从事博士后研究，于 2023 年 9 月加入北京师范大学数学研究中心和北师大港浸大应用数学系。王辰博士的研究方向为流体力学和应用分析，具体包括地球、天文物理中的流体力学，流动中的波动和稳定性，以及渐进分析方法在其中的应用。

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