

数学与系统科学研究院  
计算数学所网络学术报告

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报告题目:

**Crank-Nicolson-Weighted-Shifted-Grunwald-Difference Schemes for Space Riesz Variable-Order Fractional Diffusion Equations**

邀请人: 白中治 研究员

报告时间: 2021 年 9 月 25 日 (周六)

晚上 20:00-21:00

报告工具: 腾讯会议 ID: (252 740 524)

## **Abstract:**

In this talk, high-order finite difference methods are proposed to solve the initial-boundary value problem for space Riesz variable-order fractional diffusion equations. Based on weighted-shifted-Grunwald-difference (WSGD) operators proposed in [J Comput Appl Math 363 (2020) 77-91] for Riemann-Liouville fractional derivatives, we derive WSGD operators for variable-order ones by using the relation between variable-order fractional derivative and (constant-order) fractional derivative. We then apply Crank-Nicolson-weighted-shifted-Grunwald-difference (CN-WSGD) schemes to the initial-boundary problem for space Riesz variable-order diffusion equations. Theoretical results on the stability and convergence of CN-WSGD schemes are presented and proved. Moreover, we derive a problem-based method to choose suitable CN-WSGD schemes which leads to unconditioned stable linear systems with optimal upper bound for accuracy.

**欢迎大家参加！**