数学与系统科学研究院

计算数学所学术报告

报告人： **Prof. Martin Stynes**

（ Beijing Computational Science Research Center ）

报告题目：

Blow-up of error estimates in time-fractional initial-boundary value problems

邀请人： 唐贻发 研究员

报告时间： 2021 年 8 月 20 日（周五）

上午 **10:00-11:00**

报告地点： 数学院南楼

902 教室

Abstract：

Time-fractional initial-boundary value problems of the form $D_t^\alpha u-p \partial^2 u/\partial x^2 +cu=f$ are considered, where $D_t^\alpha u$ is a Caputo fractional derivative of order $\alpha\in (0,1)$. As $\alpha\to 1^-$, we prove that the solution u converges, uniformly on the space-time domain, to the solution of the classical parabolic initial-boundary value problem where $D_t^\alpha u$ is replaced by $\partial u/\partial t$. Nevertheless, most of the rigorous analyses of numerical methods for this time-fractional problem have error bounds that blow up as $\alpha\to 1^-$, as we demonstrate. We show that in some cases these analyses can be modified to obtain robust error bounds that do not blow up as $\alpha\to 1^-$.

报告人简介：

Prof. Martin Stynes received his M.Sc. degree in Mathematics, University College Cork, Ireland, in 1972 and Ph.D. degree in Mathematics, Oregon State University, USA, in 1977. He was a Lecturer at Waterford Regional Technical College, Ireland from 1979 to 1984. He then moved to University College Cork, where he was successively Lecturer, Statutory Lecturer, Professor (Scale 2) — these are the equivalents of assistant/associate/full professor. He was a Fulbright Research Professor at Kent State University (USA) in 1990, Royal Society Visiting Fellow at Oxford University (U.K.) in 1991, Visiting Professor at University of Colorado at Denver (USA) in 1997, DFG Visiting Professor at Otto von Guericke University Magdeburg (Germany) in 1998, Visiting Professor at the University of South Carolina (USA) in 2004, and DFG Mercator Guest Professor at the Technical University of Dresden (Germany) in 2008. He was the elected President of the UK and Republic of Ireland Section of SIAM 2003-5.

He serves on the editorial boards of the journals Advances in Computational Mathematics, Computational Methods in Applied Mathematics, Fractional Calculus and Applied Analysis, Journal of Scientific Computing, and Mathematical Proceedings of the Royal Irish Academy.

He took early retirement from University College Cork in 2012 in order to concentrate on research. He has been at CSRC since 2014.

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