数学与系统科学研究院

计算数学所学术报告

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报告题目：

A Second Order Scheme for Time-Space Fractional Nonlinear Diffusion-Wave Equations

邀请人： 唐贻发 研究员

报告时间：2017 年 5 月 28 日（周日）

晚上 19:30-20:30

报告地点： 数学院南楼七层

702 教室

Abstract：

In this talk, we will discuss a second order finite difference method for time-space fractional nonlinear diffusion-wave equations with initial boundary conditions. To obtain the second order accuracy in time, we firstly transform the fractional diffusion-wave equations into their equivalent partial integro-differential equations. Then fractional central difference approximation is used to discretize Riesz derivative in space. Crank-Nicolson technique and a second order convolution quadrature are used to deal with first order derivative and Riemann-Liouville integral in time, respectively. Two important lemmas are established to prove the stability and convergence of our scheme. We prove that the spatial numerical convergence is the second order. It's more interesting that the numerical convergence in time is α order for inhomogeneous initial value, and is the second order for homogeneous initial value, where α is the index of Caputo derivative in time. Finally, two numerical examples are provided to support our theoretical results.

欢迎大家参加！