

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:

**Convolution Quadrature Methods
for Time-Space Fractional Nonlinear
Diffusion-Wave Equations**

邀请人: 唐贻发 研究员

报告时间: 2017 年 10 月 28 日(周六)

下午 14:30-15:30

报告地点: 数学院南楼七层

702 教室

Abstract:

In this talk, two second-order convolution quadrature methods are presented to numerically solve a class of time-space fractional diffusion-wave equations with nonlinear source. For avoiding to discretize the temporal Caputo derivative directly and improving the numerical stability, the fractional diffusion-wave equations are firstly transformed into their equivalent partial integro-differential equations. Then, a second-order convolution quadrature suggested by Lubich is applied to approximate the Riemann-Liouville integral, the deduced convolution quadrature method can handle the solution with low regularity in time. And then, another second convolution quadrature method is proposed based on a new second-order approximation for discretizing the Riemann-Liouville integral at time $t_{k-\frac{1}{2}}$, which reduces the computational complexity when Crank-Nicolson technique is used. The stability and convergence of these two new methods are rigorously proved and discussed. Numerical experiments are carried out to demonstrate the theoretical results and efficiencies of our methods.

欢迎大家参加！