计算数学所学术报告

报告人：**Associate Prof. Jincheng Ren**

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报告题目：

Unconditional superconvergence analysis of finite element method for nonlinear diffusion equation

邀请人： 唐贻发研究员

报告时间：**2017 年 12 月 5 日（周二）**

下午 14:30-15:30

报告地点： 数学院南楼

七层 702 教室

报告摘要：**In this talk, an effective and fast finite element numerical algorithm with high-order**

accuracy is discussed for the nonlinear time fractional diffusion equation. A two-level linearized Galerkin finite element method (FEM) is developed and a temporal-spatial error splitting argument is established to split the error into two parts, which are called the temporal error and the spatial error, respectively. The temporal error is proved skillfully which leads to the analysis for the regularity of the time-discrete system. The spatial error which is deduced with the help of the Ritz projection operator. Unconditional superclose result in H^1-norm of order $\mathcal{O}(\tau^{\alpha}+h^2)$ is obtained, without any extra regularity assumption on the exact solution of the problem considered. Then the global superconvergence property is obtained by the interpolated postprocessing technique. In order to reduce the storage requirement and computing cost, a fast evaluation scheme to solve the nonlinear fractional diffusion equation is designed. Some numerical results are provided to verify the theoretical analysis. (受交叉中心资助)