数学与系统科学研究院

计算数学所学术报告

报告人：　Prof. Igor Boglaev

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报告题目：

Monotone numerical methods for nonlinear parabolic problems

邀请人：　　谢和虎 研究员

报告时间：2016 年 8 月 10 日（周三）

上午 10:00-11:00

报告地点：　　数学院南楼七层

702 会议室

摘要：

The talk is concerned with monotone numerical methods for nonlinear parabolic problems. Various monotone iterative methods, including the monotone fully implicit, the monotone weighted average and the monotone ADI methods, are presented. The basic idea of the iterative methods for the computation of numerical solutions is the monotone approach which involves the notion of upper and lower solutions and the construction of monotone sequences from a suitable linear discrete system. Using upper and lower solutions as two distinct initial iterations, two monotone sequences from a suitable linear system are constructed. The monotone property of the iterations gives improved upper and lower bounds of the solution in each iteration. Error estimates between the computed approximations and the solutions of the nonlinear discrete problems are obtained for each monotone iterative method. The monotone convergence property is used to prove the convergence of the nonlinear discrete problems to the corresponding differential problems as mesh sizes decrease to zero. Applications are given to several models arising from physical, chemical and biological systems. Numerical experiments are given to some of these models, including a discussion on a rate of convergence of the monotone sequences.

欢迎大家参加！