

数学与系统科学研究院
计算数学所网络学术报告

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报告题目:

**Restrictive Preconditioning for
Convection-diffusion Distributed
Control Problems**

邀请人: 白中治 研究员

报告时间: 2021 年 10 月 2 日 (周六)

晚上 20:00-21:00

报告工具: 腾讯会议 ID: (610 724 982)

Abstract:

With restrictive preconditioning technique, the preconditioned conjugate gradient method and preconditioned Chebyshev iteration method are studied for solving the saddle point linear systems arising from the convection-diffusion control problems. Utilizing an appropriate Schur complement, the eigenvalues of the preconditioned matrix are contained in $[1/2, 1]$. The convergence rate of the proposed methods are discovered. Compared with restrictively preconditioned conjugate gradient method, the restrictively preconditioned Chebyshev iteration method is more tolerant for the inexact execution of the preconditioning. It indicates that the preconditioned Chebyshev iteration method is more practical for solving the large scale linear systems. The theoretical analysis and numerical results indicate that the iteration count of the proposed solvers are independent of the mesh size of discretization, the regularization parameter and even the Peclet number.

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