北京理工大學

数学与统计学院学术报告

Eigenvalue decay bounds for the Gramian operator of the heat equation

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时间： 2025. 6. 11 上午10:30--11:30

地点： 文萃楼E 609

摘要： The talk deals with the eigenvalue decay of solutions to operator Lyapunov equations, a relevant topic in the context of model reduction for parabolic control problems. We mainly focus on the Gramian operator that arises in the context of control and observation of heat processes in infinite time.By improving existing energy and observability estimates for parabolic equations, we obtain both upper and lower bounds on the convergence rate of the eigenvalues of the Gramian operator towards zero. Both bounds follow the same polynomial decay rate, up to a multiplicative constant, which ensures their optimality. This confirms the slow decay of the eigenvalues and limits the efficiency of model reduction. The theoretical findings are accompanied by numerical results. We compute eigenvalue estimates from Galerkin discretizations of Lyapunov equations and discuss the appearance of a spurious branch in the discrete spectrum.

报告人简介： University of Dubrovnik教授，长期从事控制理论的相关研究，在Automatica, ESIAM, JFA, NA等国际权威期刊发表文章数十篇。

主办单位：北京理工大学数学与统计学院

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