



复旦大学数学科学学院 数学综合报告会

报告题目: Convergence analysis of a nonlinear
eigensolver based on rational approximation of the
resolvent

报告人: 邵年 (EPFL)

时间: 2026-01-05 星期一 09:00

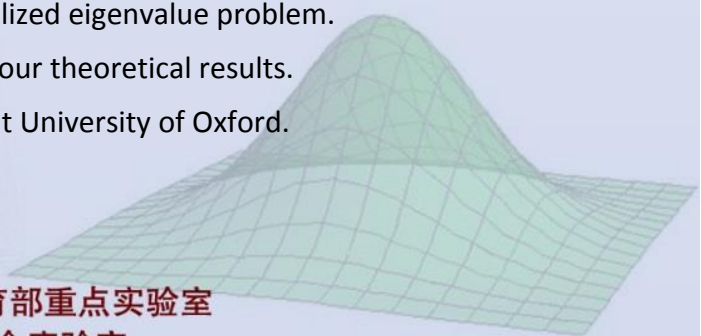
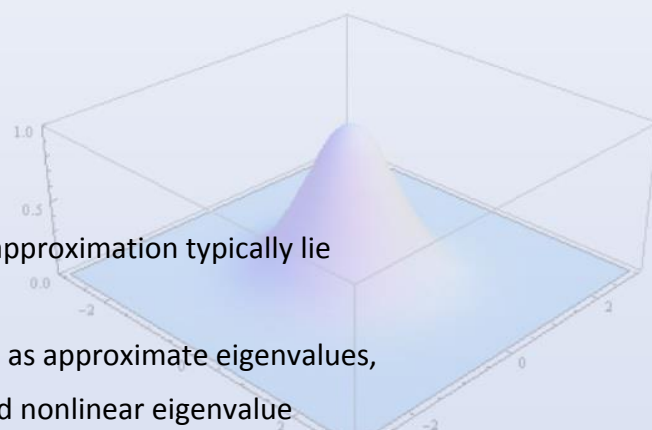
地点: 光华楼东主楼1801

报告摘要:

Given a meromorphic function, the poles of its rational approximation typically lie close to those of the function itself.

When applied to a sketched resolvent, these poles serve as approximate eigenvalues, providing a flexible framework for solving both linear and nonlinear eigenvalue problems. However, the accuracy of the computed eigenvalues is limited and remains poorly understood. In this talk, we analyze the convergence of this approach and demonstrate the effectiveness of two techniques to improve accuracy: block probing and zooming in. The substantial gains achieved by reducing the number of poles within each region is justified. We also establish the backward and forward stability of polefinding for a barycentric rational form via a generalized eigenvalue problem. Numerical experiments demonstrate the sharpness of our theoretical results.

This talk is based on joint work with Yuji Nakatsukasa at University of Oxford.



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