

数学与系统科学研究院
计算数学所系列学术报告

报告人: **Prof. Jiguang Sun**

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报告题目:

**Recursive Integral Method for
Eigenvalue Problems**

邀请人: 季霞 副研究员

报告时间及地点:

2017年6月9日(周五)上午8:30-11:30

科技综合楼311报告厅

2017年6月16日(周五)上午8:30-11:30

科技综合楼311报告厅

2017年6月23日(周五)上午8:30-11:30

科技综合楼311报告厅

2017年6月30日(周五)上午8:30-11:30

科技综合楼301报告厅

Abstract:

1. Functional Analysis and Spectral Projection:

Basic spectral theory, including spectrum approximation, in function analysis will be introduced. Spectral projection based on Cauchy integrals will be covered. Properties of the spectral projection will be proved.

2. Recursive Integral Method, the First Version:

We introduce the recursive integral method for non-Hermitian eigenvalue problems. The method, which overcomes some difficulties of existing methods, is based on spectrum projection. It is self-correcting, can separate nearby eigenvalues, and does not require an a priori spectral information. These features make the method well suited for large sparse non-Hermitian eigenvalue problems whose spectra are complicated. Numerical examples show that the method is effective and robust.

3. Recursive Integral Method with Cayley Transformation:

We shall discuss an improved version of RIM for non-Hermitian eigenvalue problems. Using Cayley transforms, together with a new indicator, the computation cost is reduced significantly. Numerical examples are presented and compared with 'eigs' in Matlab.

4. Applications of Recursive Integral Method:

We show some applications of Recursive Integral Method including the transmission eigenvalue problems, social network problems, localized quantum states, and some chemical problems. We shall also discuss some future improvements of RIM.

欢迎大家参加！