计算数学所学术报告

报告人： 孙继广 研究员

(Michigan Technological University)

报告题目：

Direct and Inverse Steklov Eigenvalue Problems

邀请人： 季霞 副研究员

报告时间：**2018 年 1 月 8 日（周一）**

上午 10:00--11:00

报告地点：数学院科技综合楼

Z311 报告厅

报告摘要：

We study the direct and inverse non-selfadjoint Steklov eigenvalue problems.

An efficient numerical method for a non-selfadjoint Steklov eigenvalue problem is proposed. The

Lagrange finite element is used for discretization. The convergence is proved using the spectral perturbation theory for compact operators. The non-sefadjointness of the problem leads to non-Hermitian matrix eigenvalue problem. Due to the existence of complex eigenvalues and lack of a priori spectral information, we propose a modified version of the recently developed spectral indicator method to compute (complex) eigenvalues in a given region on the complex plane. In particular, to reduce computational cost, the problem is transformed into a much smaller matrix eigenvalue problem involving the unknowns only on the boundary of the domain. Numerical examples are presented to validate the effectiveness of the proposed method.

Steklov eigenvalues are associated with the inverse scattering problem of inhomogeneous media. Some technique to reconstruct Steklov eigenvalues is discussed. These eigenvalues can further be used to obtain information of the physical property of the scatterer using certain statistical method.