

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:

**Inverse Random Source Problems
for Wave Equations**

邀请人: 周爱辉 研究员

报告时间: 2020 年 12 月 29 日(周二)

上午 9:00-10:00

报告工具: 腾讯会议 (ID: 965925450)

参会密码: 2020

Abstract:

The inverse source problem, as an important research subject in the inverse scattering theory, has significant applications in diverse scientific and industrial areas such as antenna design and synthesis, medical imaging, and optical tomography. The inverse random source problem refers to the inverse source problem that involves uncertainties. Compared to the deterministic counterpart, the inverse random source problem is substantially more challenging due to the additional difficulties of randomness and uncertainties.

In this talk, our recent progress will be discussed on inverse source problems for the stochastic acoustic and electromagnetic wave equations. I will present a new model for the random source, which is assumed to be a microlocally isotropic Gaussian random field such that its covariance operator is a classical pseudo-differential operator. Given the random source, the direct problem is to determine the wave field; the inverse problem is to recover the unknown source that generates the prescribed radiated wave field. The well-posedness and regularity of the solution will be addressed for the direct problem. For the inverse problem, it is shown that the principal symbol of the covariance operator of the random source can be uniquely determined by the high frequency limit of the wave field at a single realization. I will also highlight some ongoing and future projects in the inverse random potential and medium problems for wave equations.

欢迎大家参加！