

数学与系统科学研究院

计算数学所学术报告

报告人: **Prof. Xudong Chen**

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报告题目:

**Deep Learning for Quantitative  
Imaging by Solving Full-Wave  
Inverse Scattering Problem**

邀请人: 陈志明 院士

报告时间: **2018 年 12 月 12 日 (周三)**

**上午 10:00-11:00**

报告地点: **数学院南楼六层**

**602 教室**

## **Abstract:**

The talk aims to solve a full-wave inverse scattering problem (ISP), which is a quantitative imaging problem, i.e., to reconstruct the permittivities of dielectric scatterers from the knowledge of measured scattering data. This is also referred to as an inverse medium problem. This talk proposes the convolution neural network (CNN) technique to solve full-wave ISPs. In order to make machine learning more powerful, a deep understanding of the corresponding forward problem is desirable. In solving ISP, the concept of induced current plays an essential role in the proposed CNN technique, which enables us to design architecture of learning machine such that unnecessary computational effort spent in learning wave physics is minimized or avoided. Numerical simulations demonstrated that the proposed CNN scheme outperforms a brute-force application of CNN. The proposed deep learning inversion scheme is promising in providing quantitative images in real time.

**欢迎大家参加！**