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：

Introduction to Full-waveform inversion

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报告时间：**2021** 年 **12** 月 **3** 日（周五）

上午 **10:00-11:00**

报告工具：腾讯会议（**ID**：**752 194 169**）

会议链接：

https://meeting.tencent.com/dm/UVD6xL9SbY6O

Abstract:

Seismic imaging using full-wavefield data that includes primary reflections, transmitted waves, and their multiples has been the holy grail for generations of geophysicists. To be able to use the full-wavefield data effectively requires a forward-modeling process to generate full-wavefield data, an inversion scheme to minimize the difference between modeled and recorded data, and, more importantly, an accurate velocity model to correctly propagate and collapse energy of different wave modes. All these elements have been embedded in the framework of full-waveform inversion (FWI) since it was proposed three decades ago. However, for a long time, the application of FWI did not find its way into the domain of full-wavefield imaging, mostly owing to the lack of data sets with good constraints to ensure the convergence of inversion, the required compute power to handle large data sets and extend the inversion frequency to the bandwidth needed for imaging, and, most significantly, stable FWI algorithms that could work with different data types in different geologic settings. Recently, with the advancement of high-performance computing and progress in FWI algorithms at tackling issues such as cycle skipping and amplitude mismatch, FWI has found success using different data types in a variety of geologic settings, providing some of the most accurate velocity models for generating significantly improved migration images. Here, we take a step further to modify the FWI workflow to output the subsurface image or reflectivity directly, potentially eliminating the need to go through the time-consuming conventional seismic imaging process that involves preprocessing, velocity model building, and migration. Compared with a conventional migration image, the reflectivity image directly output from FWI often provides additional structural information with better illumination and higher signal-to-noise ratio naturally as a result of many iterations of least-squares fitting of the full-wavefield data. In this talk, I will give a brief introduction to FWI, its history and recent advancement.

欢迎大家参加！