数学与系统科学研究院

计算数学所学术报告

报告人：　**Dr. Yong Zhang**

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报告题目：

Analysis-based fast algorithms for convolution-type nonlocal potential in Nonlinear Schrödinger equation

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报告时间：**2017** 年 **5** 月 **18** 日（周四）

上午 **10:00-11:00**

报告地点：　科技综合楼三层

311 报告厅

Abstract:

Convolution-type potential are common and important in many science and engineeringfields. Ecient and accurate evaluation of such nonlocal potentials are essential in practical simulations. In this talk, I will focus on those arising from quantum physics/chemistry and lightning-shield protection, including Coulomb, dipolar and Yukawa potentials that are generated by isotropic and anisotropicsmooth and fast-decaying density. The convolution kernel is usually singular or discontinuous at the originand/or at the far field, and density might be anisotropic, which together present great challenges fornumerics in both accuracy and eciency. The state-of-art fast algorithms include Wavelet based Method(WavM), kernel truncation method(KTM), NonUniform-FFT based method(NUFFT) and Gaussian-Sumbased method(GSM). Gaussian-sum/exponential-sum approximation and kernel truncation technique, combined with finite Fourier series and Taylor expansion, finally lead to a O(N log N) fast algorithmachieving spectral accuracy. Applications to NLSE are reviewed.

欢迎大家参加！