

数学与系统科学研究院

# 计算数学所学术报告

(定期学术报告)

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报告题目:

Modified Fourier expansion and  
Birkhoff series

邀请人: 洪佳林研究员

报告时间: 2007年9月20日(周四)

下午 16:00—17:00

报告地点: 科技综合楼三层 311

计算数学所报告厅

## Abstract:

We present an alternative to the familiar Fourier expansion for non-periodic smooth functions, shifting sine functions by half-period. This results in an expansion which converges considerably more rapidly. Moreover, since the expansion coefficients are highly oscillatory integrals, they can be evaluated using highly oscillatory quadrature in  $O(n)$  operations, faster than FFT. We prove convergence and describe the evaluation of the coefficients in both highly oscillatory and classical setting. Finally, we explain superior rate of convergence identifying the underlying basis with eigenfunctions of the Laplace, Neumann operator. This allows us to generalise the framework to Birkhoff series with suitable boundary conditions.

**欢迎大家参加!**