



复旦大学数学科学学院 数学综合报告会

报告题目: Bulk universality and quantum unique ergodicity of random band matrices

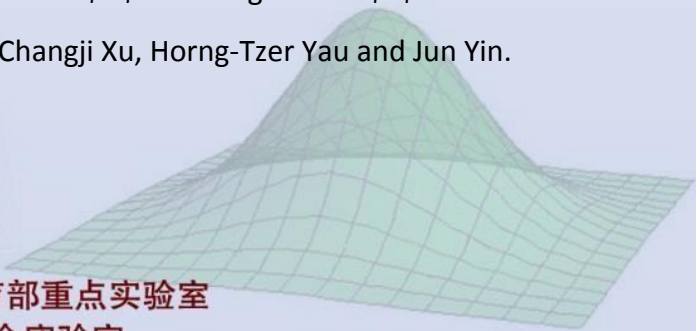
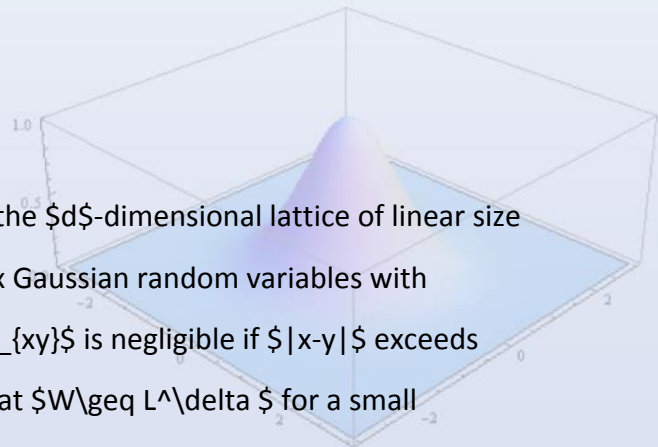
报告人: 杨帆 副教授 (清华大学)

时间: 2023-03-09 星期四 13:30-14:30

地点: 腾讯会议 ID: 665-541-454

报告摘要:

Consider a general class of random band matrices H on the d -dimensional lattice of linear size L . The entries of H are independent centered complex Gaussian random variables with variances s_{xy} , which have a banded profile so that s_{xy} is negligible if $|x-y|$ exceeds the band width W . In dimensions $d \geq 7$, assuming that $W \geq L^\delta$ for a small constant $\delta > 0$, we prove the delocalization and quantum unique ergodicity (QUE) of the bulk eigenvectors of H . Furthermore, we prove the bulk universality of H under the condition $W \gg L^{95/(d+95)}$. In the talk, I will discuss a new idea for the proof of the bulk universality through QUE, which verifies the conjectured connection between QUE and bulk universality. The proof of QUE is based on a local law for the Green's function of H and a high-order T -expansion developed recently. Based on Joint work with Changji Xu, Horng-Tzer Yau and Jun Yin.



非线性数学模型与方法教育部重点实验室
中法应用数学国际联合实验室
上海市现代应用数学重点实验室
复旦大学数学研究所