日期: 2022.3.8. 10:00-11:00 am (Beijing time).

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报告人: 杨帆 (UPenn)

题目: Delocalization and quantum diffusion of random band matrices in high dimensions

摘要: We consider a Hermitian random band matrix H on the d-dimensional lattice of linear size L. Its entries are independent centered complex Gaussian random variables with variances s_{xy}, that are negligible if $|x-y|$ exceeds the band width W. In dimension is seven or higher, we prove that, as long as $W > L^{\epsilon}$ for a small constant $\epsilon > 0$, with high probability, most bulk eigenvectors of H are delocalized in the sense that their localization lengths are comparable to L. Moreover, we also prove a quantum unique ergodicity estimate for the eigenvectors and a quantum diffusion result in terms of the Green's function of H. Joint work with Changji Xu, Horng-Tzer Yau and Jun Yin.