

Continuum limit of random matrix products in statistical mechanics of disordered systems

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The talk will be about a particular weak disorder limit (*continuum limit*) of matrix products that arise in the analysis of disordered statistical mechanics systems, with a particular focus on random transfer matrices. The limit system is a diffusion model for which the leading Lyapunov exponent can be expressed explicitly in terms of modified Bessel functions, a formula that appears in the physical literature on these disordered systems. I will first present results about connecting (the leading Lyapunov exponent of) the diffusion system and (the leading Lyapunov exponent of) the matrix products. Then I will discuss the application to two specific cases: 1. the strong interaction limit of the disordered Ising model in one dimension; 2. the two dimensional Ising model with columnar disorder (McCoy-Wu model). This talk will be based on work in collaboration with Francis Comets and Rafael L. Greenblatt.

References

- [1] F. COMETS, G. GIACOMIN AND R. L. GREENBLATT , *Continuum limit of random matrix products in statistical mechanics of disordered systems*, Commun. Math. Phys. 369 (2019), 171-219.