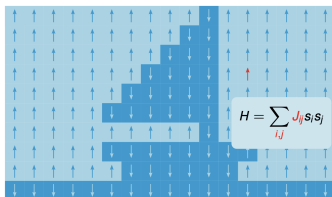
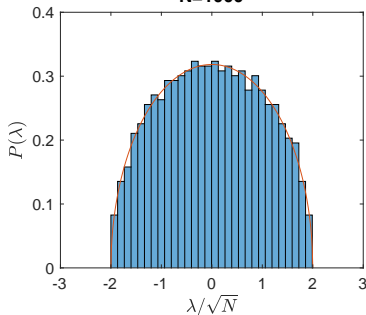


Random matrices- Theory and Application - winter term 24

- Applications in Physics
 - AI and Neural Networks (Hopfield Model)
 - Heavy Nuclei
 - Anderson Localisation
 - Vibrations of a membrane
 - Glass transition
- Some Random Matrix Ensembles
 - Wigner matrices
 - Gaussian Ensembles
 - Wishard Matrices
- Universality
 - Semi-circle law
 - Marchenko-Pastur law
 - Level Spacing
- Free Probability Theory
- Further Reading:
 - F. Cugliandolo, lecture notes
 - G.Livan et al.



N=1000



Formalities

Time and Requirements

Organisational meeting: Thursday 24.10.2024, 13:30, G203

- seminar talk, written report
- language depending on participants English or German
- Questions: florian.vogel ; alexandra.blessing ; matthias.fuchs

Prerequisites

- Linear Algebra
- Probability theory (statistical Mechanics)
- Measure Theory (optional)
- Combinatorics (optional)

Concepts

- Introduction to random matrices
- Free probability
- Statistics of largest eigenvalue
- Modeling of complex systems