

Institute for Applied Mathematics, Bonn University

Oberseminar Stochastik

Thursday, January 25, 2024, 16:30

Lipschitz-Saal (LWK 1.016)

Jan Nagel

TU Dortmund

Sum rules via large deviations: polynomial potentials and the multi-cut regime

A sum rule is an identity connecting the entropy of a measure with the coefficients involved in the construction of its orthogonal polynomials, or Jacobi coefficients. It is possible to prove sum rules using large deviation theory. We consider the weighted spectral measure of random matrices and prove a large deviation principle when the size of the matrix tends to infinity. The measure may be described by its spectral information or its Jacobi coefficients. This allows to write the rate function in two different ways, which leads to the sum rule. In this talk I present an extension to unitarily invariant random matrices in the multi-cut case, when the limit of the spectral measure is supported by several disjoint interval. In this case we can still prove a large deviation principle for the weighted spectral measure. Additionally, if the potential is a polynomial, we have an alternative description for the rate function in term of the Jacobi coefficients. The talk is based on a joint work with Fabrice Gamboa and Alain Rouault.