

AG Zufallsmatrizen

Seminar

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Planar Orthogonal Polynomials on Ellipses in the Complex Plane

Planar Orthogonal polynomials (OP) appears in a natural way in the Normal Matrix Model in Random Matrices, A prominent example is the elliptic Ginibre ensemble whit associated OP are the Hermite polynomials. Laguerre polynomials in the complex plane were found in the context of applications to QCD of the Random Matrices. A natural question is whether the Jacobi polynomials extend to orthogonality relation on the complex plane with respect an Hermitian inner product. We show that Gegenbauer polynomials (symmetric Jacobi) form a family of planar orthogonal polynomials on an ellipse as a corollary we obtain orthogonality relations for a subfamilies of Jacobi polynomials, in particular for Legendre and Chebyshev polynomials. This is a joint work with Gernot Akemann, Taro Nagao and Graziano Vernizzi.

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