

Zeros of conditional Gaussian analytic functions, random sub-unitary matrices and q-series

mardi 9 avril 2024 14:00 (1 heure)

I will talk about zeros of the infinite Gaussian power series $f(z) = \sum c_k z^k$ conditioned on the event that $f(0) = a$. Forrester and Ipsen 2019 showed that if the coefficients c_k are independent standard complex normals then the conditional probability law of the zero set of $f(z)$ can be obtained from that of the spectrum of random subunitary matrices. I will explain how using this connection one obtains the conditional distribution of the smallest zero of $f(z)$ in terms of q -series and discuss its dependence on the parameter a . In the realm of the extreme value theory, the modulus of the smallest zero r_{min} is realised as the smallest value of a sequence of independent random variables subject to a constraint. Although the conditional probability distribution of r_{min} is not one of the three canonical forms, it interpolates between Gumbel and a particular case of Frechet distribution which arise in scaling limits of large and small a . My talk is based on joint work with Yan Fyodorov and Thomas Prellberg.

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