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Noise limits for complex eigenvalues

Consider a Coulomb gas in the plane: n points distributed with density proportional to product $|x_i - x_j|^2$ with respect to some underlying measure μ.

When μ is Gaussian, this process coincides with the eigenvalues of matrix filled with i.i.d. complex normal entries. Other choices of μ yield the zeros of i.i.d. Gaussian power series, the projection of the spherical gas, or the eigenvalues of a random unitary matrix.

When the points get denser, these processes converge to noises that are different from the usual white one.

This is joint work with Brian Rider.