Large \( n \)-limit for random matrices with external source with three distinct eigenvalues

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Abstract:
In this talk, we analyze the large \( n \)-limit for random matrix with external source with three distinct eigenvalues. And we confine ourselves in the Hermite case and the three distinct eigenvalues are \(-a, 0, a\). For the case \(a^2 > 3\), we establish the universal behavior of local eigenvalue correlations in the limit \( n \to \infty \), which is known from unitarily invariant random matrix models. Thus, local eigenvalue correlations are expressed in terms of the sine kernel in the bulk and in terms of the Airy kernel at the edge of the spectrum. The result can be obtained by analyzing \(4 \times 4\) Riemann-Hilbert problem via nonlinear steepest decent method.

References: