

Spectral Properties of Random Matrices

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In this talk, we have two parts. In the first part, one studies the asymptotic behavior of the distribution of the eigenvalues of the ensemble of random matrices which generalizes the Wigner ensemble and the ensembles of band random matrices. More precisely, one considers a matrix with a random band of width, this model motivated by a model of percolation to long-range. One studies this ensemble aiming to obtain the semicircle law and to obtain a support of the universality conjecture for the band matrices. At the end, one gives some results about the random matrix operators of the long-range percolation model.

In the second part, one studies the ensemble of dilute random matrices aiming to have an improvement of the convergence to the semicircle law and to show that this ensemble and the Wigner ensemble have the same class of universality.