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Edge universality for non-Hermitian random matrices

Abstract:

We consider large non-Hermitian real or complex random matrices X with independent, identically distributed centred entries. We prove that their local eigenvalue statistics near the spectral edge, the unit circle, coincide with those of the Ginibre ensemble, i.e. when the matrix elements of X are Gaussian. This result is the non-Hermitian counterpart of the universality of the Tracy-Widom distribution at the spectral edges of the Wigner ensemble.

One of the main novelties is an optimal lower tail estimate on on the lowest singular value for shifted Ginibre matrices that we achieve by the superbosonisation formula.

This is a joint work with Giorgio Cipolloni and Dominik Schroeder