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Eigenvector Correlations for the Ginibre Ensemble

The complex Ginibre ensemble is an $N \times N$ non-Hermitian random matrix over \mathbb{C} with i.i.d. complex Gaussian entries normalized to have mean zero and variance $1/N$. Unlike the Gaussian unitary ensemble, for which the eigenvectors are distributed according to Haar measure on the compact group $U(N)$, independently of the eigenvalues, the geometry of the eigenbases of the Ginibre ensemble are not particularly well understood. In this talk I will explain recent work with Ron Rosenthal in which we systematically study properties of eigenvector correlations in this matrix ensemble. We uncover an extended algebraic structure which describes their asymptotic behavior (as N goes to infinity). Our work extends previous results of Chalker and Mehlig, in which the correlation for pairs of eigenvectors was computed.