

Central limit theorem for linear spectral statistics of deformed Wigner matrices

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Abstract

In this talk, we consider large-dimensional Hermitian random matrices of the form $W = M + \vartheta V$ where M is a Wigner matrix and V is a random or deterministic, real, diagonal matrix whose entries are independent of M . The random matrix ensemble is known as *deformed Wigner matrices*. For analytic test function, we study the fluctuation of functional of the eigenvalues of W . We prove that the fluctuation can be decomposed into that of M and of V , and each of those weakly converges to a Gaussian distribution. The proof is based on the analysis of Stieltjes transform with self-comparison.

- [1] H. C. Ji and J. O. Lee. Central limit theorem for linear spectral statistics of deformed Wigner matrices. arXiv:1712.00931.
- [2] J. O. Lee and K. Schnelli. Local deformed semicircle law and complete delocalization for Wigner matrices with random potential. *J. Math. Phys.*, 54(10):103504, 62, 2013.