

Large deviations for macroscopic observables of heavy-tailed matrices

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This is an ongoing joint work with Alice Guionnet and Camille Male. We consider a finite collection of Hermitian heavy-tailed random matrices of dimension N . Our model include the Lévy matrices introduced by Bouchaud and Cizeau or sparse random matrices with $O(1)$ non-zeroes entries per row. When represented as weighted graphs on N vertices, these matrices have local weak limits in the Benjamini-Schramm topology. Thanks to this representation, we establish large deviations principle for macroscopic observables of such collection of matrices. These observable include the empirical distribution of the eigenvalues and empirical distribution of the neighborhood distribution.

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