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THE UNIVERSITY OF
MELBOURNE

Seminar

Bielefeld - Melbourne Random Matrices

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KU Leuven

Stable invariant Hermitian random matrices and the rate of convergence

We consider random matrix ensembles on the Hermitian matrices that are heavy tailed, in particular not all moments exist, and that are invariant under the conjugate action of the unitary group. The latter property entails that the eigenvectors are Haar distributed and, therefore, factorise from the eigenvalue statistics.

We prove a classification for stable matrix ensembles of this kind of matrices with the help of the classification of the multivariate stable distributions and the harmonic analysis on symmetric matrix spaces. They can be classified by the stability parameter and the spectral measure, apart from a scaling and a shift.

Moreover, we address the question how these ensembles can be generated from the knowledge of the first two quantities. We consider a sum of a specific construction of identically and independently distributed random matrices that are based on Haar distributed unitary matrices and stable random vectors. For this construction, we derive the rate of convergence in the supremum norm and show that this rate is optimal. As a consequence we also give the rate of convergence in the total variation distance

**Wednesday, 22 March 2023,
0900 hrs CET**

Zoom Conference call— Please contact Lucas Hackl
(lucas.hackl@unimelb.edu.au) for details regarding access