Quantitative estimates on random matrices using free probability tools

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In this talk, we highlight first the connection between free probability theory and random matrices. We then show how free probability tools can be used to obtain regularity properties of limiting spectral distributions and how to quantify such convergences for some random matrix models. In particular, we consider a class of random block matrices and derive quantitative estimates on the level of Cauchy transforms that can be passed to the Kolmogorov distance in some cases.

The content of the talk is based on results from joint works with G. Cébron and T. Mai.