19th Workshop: Noncommutative Probability, Noncommutative Harmonic Analysis and Related Topics with Applications, 31.07-6.08.2022, Będlewo

ABSTRACT

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Entry permutations, asymptotic distributions and asymptotic free independence for several classes of random matrices

Abstract: The notion of Free Independence occurs naturally in the study of large random matrices as a suitable analogue to the notion of independence of commutative random variables. In particular, since 1980s, large classes of random matrices have been shown to be asymptotically free from random matrices with entries independent from their entries. Some years ago, together with J. A. Mingo, we showed the (surprising at that time) result that ensembles of unitarily invariant random matrices are asymptotically free from their transposes. This brought the natural question if the result can be extended (or not) to other classes of entry permutations. That is, given an ensemble $(A_N)_N$ of random matrices and a sequence of entry permutations $(\sigma_N)_N$, can we formulate conditions such that the initial ensemble $(A_N)_N$ and the one consisting on matrices with permuted entries $(A_N^{\sigma_N})_N$, are asymptotically free? Also, what are the possible limit distributions for the matrices with permuted entries? The lecture will present some recent progresses in this problem as well as some still open questions. Many of the results that will be presented are joint work with J.A. Mingo, K. Szpojankowski and P.-L. Tseng.