

# Permutation invariant random matrices and graph operads

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## Abstract

Consider two sequences of random matrices  $A_N$  and  $B_N$  of size  $N$ , whose respective  $*$  non-commutative distributions converges as  $N \rightarrow \infty$ . What can be said asymptotically about their joint  $*$ -distribution?

When the law of  $A_N$  or  $B_N$  is invariant by unitary conjugation, the latter is asymptotically described by the notion of free independence, as introduced by D. Voiculescu? In this talk, we shall consider what happens when this very assumption is dropped? We shall review recent progress addressing this question, focusing on ensembles where unitary invariance is weakened into the invariance by conjugation with permutation matrices.

- [1] Universal constructions for spaces of traffics, Guillaume Cébron, Antoine Dahlqvist and Camille Male, arXiv:1601.00168.
- [2] Large permutation invariant matrices, work in progress with Benson Au, Guillaume Cébron, Antoine Dahlqvist, Franck Gabriel and Camille Male.