

Block-modified random matrices, operator-valued free probability, and applications to entanglement theory

Tuesday October 20 – 14h00-14h45

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Motivated by the problem of entanglement detection in quantum information theory, we study the spectrum of random matrices which have been modified by a linear map acting on their blocks. More precisely, for a unitarily invariant random matrix acting on a tensor product space, we consider the matrix obtained by acting with a fixed, hermiticity preserving map, on one factor of the tensor product. We discuss the limiting spectral distribution of the modified matrix, in terms of the initial distribution of the random matrix, and of the linear map acting on the blocks. The key ingredient in the proof is a freeness result, with amalgamation over some commutative, finite dimensional algebra. This is joint work with Octavio Arizmendi and Carlos Vargas.