

Bi-Free Versions of Entropy

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Abstract

In a series of papers, Voiculescu generalized the notions of entropy and Fisher information to the free probability setting. In particular, the notions of free entropy have several applications in the theory of von Neumann algebras and free probability such as demonstrating certain von Neumann algebras do not have property Gamma, demonstrating the absence of atoms in the distributions of polynomials of random matrices, and the construction of free monotone transport. With the recent bi-free extension of free probability being sufficiently developed, it is natural to ask whether there are bi-free extensions of Voiculescu's notions of free entropy. In this talk, we will provide an introduction to the notions of free entropy, discuss bi-free versions of entropy, and discuss the difficulties and peculiarities that occur in bi-free entropy theory. This is joint work with Ian Charlesworth.