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Mixtures of Classical and Free Independence

ε -free probability was first introduced by Młotkowski in the early 2000s to understand and model q -deformed Gaussian variables, which interpolate between the usual Gaussian distribution at $q = 1$ and the free semicircular distribution at $q = 0$. It describes an independence relation for tuples of algebras, some in free position and some in tensor position. A similar construction for groups (the graph product, which interpolates between the free product and the direct product) was introduced by Green in 1990, and extended to operator algebras by Caspers and Fima, independently recovering Młotkowski's definitions. These objects have attracted quite a bit of attention over recent years, both from the viewpoint of non-commutative probability theory and in studying their operator algebraic properties directly.

I will discuss the state of the art concerning ε -free independence and graph product von Neumann algebras, including work of others and some of my own. Particular focus will be given to my recent joint work with Jekel, where we are able to use a 1969 result of Cartier and Foata on the combinatorics of words as the key to describing the type I summands of a graph product of von Neumann algebras.