

Quantum Operations on Conformal Nets

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Conformal Field Theories (CFT) in 1 or 1+1 spacetime dimensions admit several “axiomatic” (i.e. mathematically rigorous and model independent) formulations. In these axiomatic schemes one can ask the questions: given a theory A , how many and which are the possible extensions $B_i A$ or subtheories $B_i A$ of A ? What are their properties? Answers to these questions may lead to new models and to classification results. Extensions are typically described in the language of tensor categories, while subtheories require different ideas and methods. In the talk, I will report on our analysis of subtheories in the Operator Algebraic formulation. We make use of families of unital completely positive (UCP) maps acting on the CFT. These maps generalize the ordinary automorphisms of the CFT, they are compact in the pointwise ultraweak operator topology, and in some cases they can be identified with the convex space of positive probability Radon measures on a compact hypergroup (a classical generalization of a compact group, canonically associated with the inclusion $B_i A$). In general, they suffice to describe all the possible conformal inclusions $B_i A$.

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