Contribution ID: **315** Type: **Parallel session talk**

Symmetry-resolved modular correlation functions in free fermionic theories

Tuesday 22 August 2023 16:40 (20 minutes)

Recently there has been a huge research activity on the interplay between symmetries and entanglement, exploiting the block-diagonal structure of the reduced density matrix (RDM) in each charge sector. The goal of this talk is to study how the presence of a global U(1) charge affects the modular flow, a central object in the algebraic description of quantum field theory. Roughly speaking, the modular flow is given by a generalized time evolution induced by a RDM of a given spatial region. I will discuss the symmetry resolution of the modular flow and the modular correlation function of U(1)-invariant operators. I will provide a consistent definition of symmetry-resolved modular flow defined for a local algebra of operators associated with a sector with a fixed charge. I will also discuss the symmetry-resolved modular correlation functions, showing that they satisfy the KMS condition in each symmetry sector. In order to complement this analysis with an example, I will provide a toolkit for computing the symmetry-resolved modular correlation function of the charge density operator in free fermionic theories. I will show that, in a 1 + 1-dimensional free massless Dirac field theory, this quantity is independent of the charge sector at leading order in the ultraviolet cutoff expansion. This feature can be regarded as an equipartition of the modular correlation function.

Collaboration / Activity

Postdoctoral Researcher

Primary author: DI GIULIO, Giuseppe (Julius-Maximilians Universität Würzburg)

Presenter: DI GIULIO, Giuseppe (Julius-Maximilians Universität Würzburg)

Session Classification: T11 Quantum Field and String Theory

Track Classification: Quantum Field and String Theory