Abstract

Many-Body Systems

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Asymptotic Completeness in Wedge-local Quantum Field Theory

Joint with Wojciech Dybalski (PhD Advisor)

I will present N-particle scattering theory for wedge-local QFTs, as developed in my PhD project. The construction relies on the wedge duality property, which is very natural and thoroughly studied in the local and wedge-local contexts and leads to a wedge swapping symmetry of one particle states. On these grounds I can avoid a geometric pitfall in the conventional Haag-Ruelle method requiring impossible assignments of space-like separated localizing wedges to $N > 2$ particles, which has blocked progress on this topic until now.

With the new results at hand, I can pose and positively answer the question of complete particle interpretation of massive Grosse-Lechner type models. Thereby first examples of relativistic (wedge-local) QFT in four-dimensional spacetime are exhibited which are interacting and asymptotically complete. If time permits I will also discuss a mechanism for the breakdown of asymptotic completeness in models constructed recently by Longo, Tanimoto and Ueda.

(partially based on CMP 364 (2018) pp.203–232)