

MP 10: Nonrelativistic Quantum Field Theory

Time: Wednesday 15:00–15:50

Location: H7

MP 10.1 Wed 15:00 H7

Infraparticle states in the massless Nelson model - revisited
— VINCENT BEAUD¹, WOJCIECH DYBALSKI², and GIAN MICHELE GRAF³ — ¹TU Munich, Germany — ²AMU Poznań, Poland — ³ETH Zürich, Switzerland

We provide a new construction of infraparticle states in the massless Nelson model. The approximating sequence of our infraparticle state does not involve any infrared cut-offs. Its derivative w.r.t. the time parameter is given by a simple explicit formula. The convergence of this sequence to a non-zero limit as time goes to infinity is then obtained by the Cook method combined with stationary phase estimates. To apply the latter technique we exploit recent results on regularity of ground states in the massless Nelson model, which hold in the low coupling regime.

MP 10.2 Wed 15:25 H7

Infravacuum Property and Local Normality — ●BARTOSZ BŁADASIEWICZ and WOJCIECH DYBALSKI — Adam Mickiewicz University, Poznan, Poland

This talk concerns an infravacuum representation introduced by K. Kraus, L. Polley and G. Reents. Due to the infravacuum property, it is not equivalent to the standard vacuum representation of a massless scalar free field on the Minkowski spacetime. But for subalgebras corresponding to measurements performed within double cones, restrictions of respective representations are quasi-equivalent. This means that the representation is locally normal. We give a straightforward proof of this fact which is based on the Araki-Yamagami criterion. There is also an interesting group-theoretic aspect that we investigated, the relative normalizer of a pair of subgroups, introduced by D. Cadamuro and W. Dybalski. In our recent work (arXiv: 2106.02032), it re-appeared in this local relativistic setting.