



## FACULTY SEMINAR

Venue: day Wednesday, date 24.11 2021,  
seminar room A315, 16:00h

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### The Bogolyubov R-Operation in Non-renormalizable Theories

It is shown how an ordinary Bogolyubov R-operation procedure works in nonrenormalizable theories. The key point is replacement of multiplicative renormalization used in renormalizable theories by an operation where the renormalization constant depends on the momenta over which integration is carried out in subgraphs. In this case, exactly as in renormalizable theories, the requirement of locality of counterterms leads to recurrence relations connecting leading, subleading, and other successive UV divergences in all orders of perturbation theory (PT). This allows generalized renormalization group equations for scattering amplitudes to be derived, which have an integro-differential form and lead to summation of leading asymptotics, as in renormalizable theories. Some examples, including the maximally supersymmetric theories in higher dimensions, scalar models in higher dimensions as well as the Wess-Zumino model with quartic interaction in 4 dimensions are considered.