The two-point function approximation and the perturbative model for non-relativistic quantum fields

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Abstract

We study the two-point function approximation (PFA) for non-relativistic quantum fields in the presence of a local gauge group and a gauge-fixing term. We discuss the effect of a local gauge-fixing term and a gauge-fixing term of the form of fermions of the gauge group, which gives rise to a perturbative model with a Gaussian background. Using the perturbative model for non-relativistic quantum fields, we show that the two-point function approximation (PFA) is a valid approximation, and that it is within the reach of the experimental setup of the same order. Although the perturbative model is not suitable for studying the distribution of perturbative quantities at the quantum level, it allows us to evaluate the two-point function in terms of the Hamiltonian of the perturbative model, which is a quantum theory with Gaussian background. The perturbative model is a test of the equivalence between the Gaussian background and the gauge-fixing theory.