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# Recents results using optimized perturbation theory

## Abstract content

## Summary

The thermodynamics of a scalar field with a quartic interaction is studied within the optimized perturbation theory (OPT) method. Using the imaginary-time formalism the free energy is evaluated up to second order in the OPT. The method generates nonperturbative results that are then used to obtain thermodynamic quantities like the pressure. The phase transition pattern of the model is fully studied, from the broken to the symmetry restored phase. The results are compared with those obtained with other nonperturbative methods and also with ordinary perturbation theory. The results coming from the two main optimization procedures used in conjunction with the OPT method, the principle of minimal sensitivity (PMS) and the fastest apparent convergence (FAC) are also compared with each other and studied in which cases they are applicable or not. The optimization procedures are applied directly to the free energy. Recent results for transport coefficients within OPT method are presented.

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