The Free Energy of hot QCD

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Abstract

The free energy of QCD (at finite temperature T) is a most fundamental quantity, studied intensively for two decades. Strict perturbation theory does not work at all reasonable temperatures, while 4d lattice simulations work in practice only up to a few times the critical temperature T_c. Focusing on the question of how far one can go in an analytic treatment, I will give an overview of the currently used approaches like resummation, and explain in more detail our solution of the problem: a combined analytic and 3d numerical method which permits one to compute the free energy from about $2T_c$ to infinity.

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