Novel Effective Theories for High Temperature QCD

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Abstract

A mean field for the deconfining phase transition in QCD is developed. The high temperature phase is viewed as a condensate for Z(3) Wilson lines. The mean field theory, and lattice data, suggest that QCD is near a critical point for the Z(3) transition, with a large, uniform increase in the dominant correlation length. Particles are generated, at the critical temperature, from the "ringing" of the Wilson lines into pions, kaons, etc. This model predicts nonstatistical fluctuations in the average pion momentum.

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