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A minimal quasiparticle approach for the QGP and its large-Nc limits.

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Nowadays, Quark-Gluon Plasma (QGP) is a very active research field both theoretically and experimentally. QGP is a QCD state of matter obtained at large enough temperatures and/or baryonic densities and characterized by a deconfinement of quarks and gluons (i.e. quarks and gluons can move quasi freely). We propose here a quasiparticle approach to describe QGP. We use an ideal-gas framework in which quark and gluon masses depend on temperature. Our model is minimal in the sense that we use thermal quasiparticle masses (quarks and gluons) computed from perturbative techniques with standard two-loop running coupling constant and we do not allow any extra ansatz concerning the temperature-dependence of the running coupling. We show that it is able to reproduce the most recent equations of state computed on the lattice for temperatures typically higher than 2 times the critical temperature (Tc). This approach is expected to be relevant well above Tc, in temperature range in which is reasonable to neglect interactions between quasiparticles. We also compute this equation of state for a generic gauge theory with gauge groups SU(Nc) and SO(2Nc) in order to study the accurancy of various inequivalent large-Nc limits and the large-Nc equivalence between the groups SU(Nc) and SO(2Nc).

Auteur principal: LACROIX, Gwendolyn (UMONS)

Co-auteur: Dr BUISSERET, Fabien (UMONS)

Orateur: LACROIX, Gwendolyn (UMONS)

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