Real-Time Thermal Schwinger-Dyson Equation forQuark Self-energy in Landau Gauge

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Abstract: By means of a formal expression of Cornwall-Jackiw-Tomboulis effective potential for quark propagator at finite temperatures and finite quark chemical potentials, we derive the real-time thermal Schwinger-Dyson equation for quark propagator in Landau gauge. Denote the inverse quark propagator by $A(p^2)p-B(p^2)$, we argue that, when temperature T is lower than the given infrared momentum cutoff p_c, $A(p^2)=1$ is a feasible approximation and can be assumed in discussions of chiral symmetry phase transition problem in QCD.

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