

QCD equation of state at non-zero magnetic field using Dual QCD formulation

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The QCD equation of state in presence of non-zero external magnetic field is studied using Dual QCD formulation. A Dual QCD formulation is constructed in terms of dual gauge potentials which takes into account the local as well as the topological structure of the color gauge group into its dynamics. The dynamical configuration of the resulting dual QCD vacuum and its flux tube configuration have been investigated for analyzing the non-perturbative features of QCD. Thermodynamic observables including the pressure, energy density, entropy density and the speed of sound are presented as functions of the temperature and the magnetic field. The temperature dependence of these quantities confirms that the transition temperature is reduced with magnetic field. Furthermore, the temperature dependence of magnetization verifies the conclusion that the QCD matter has paramagnetic properties near and far above the critical temperature. The behavior of the speed of sound suggests that the deconfinement transition temperature is lowered as the magnetic field grows.

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