

Linear confinement and phase transitions in holographic QCD

We study linear confinement of quarks in a class of large N gauge theories using gravity duals that capture the logarithmic runnings of the coupling constants in the IR and strongly coupled asymptotic conformal behavior in the UV. First we classify the most general dual gravity that describes linear confinement of quarks at zero temperature and then show that at higher temperatures, quarks must deconfine. Using the gravity description, we also compute energy and pressure density of the gauge theory plasma and observe a rapid change as temperature is altered, indicating a phase transition. Finally we estimate the critical temperature and discuss how to analyze phase transitions in nuclear matter using holography.

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