

Dynamical Model of QCD Vacuum and Quark Confinement

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Abstract: The phase transition of a simple local gauge model is investigated in terms of the Nambu-Jona-Lasinio mechanism and it is pointed out that the physical vacuum of QCD is bound state of quark-antiquark pairs which can be viewed, generally, as a nearly perfect color dielectric medium. An important relation between the vacuum expectation value of gauge fields and scalar fields is also derived by solving the Euler equation for the gauge fields. Based on this relation the $SU_c(3)$ gauge potential is given which can be used to explain the asymptotic behavior and confinement of quarks in a hadron, and at the same time the Yukawa potential of strong interaction can be given too.

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Key words: QCD vacuum, quark confinement

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