

The Effect of Quark Mass and α - α Term on $\bar{q}q$ Condensation in QCD Vacuum

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Abstract: Beginning with the QCD Lagrangian in the global color symmetry model, we have derived a Hamiltonian including the lowest order current-current coupling. Taking instantaneous quadratic interaction kernel and using the Bogoliubov-Valatin transformation, we have got an effective Hamiltonian for computation. This Hamiltonian is similar to that introduced by Le Yaouanc et al., except that the α - α term has been considered here. We calculated the $\bar{q}q$ condensation in the BCS type of vacuum with quark mass and α - α term included. Our calculation shows that the value of $\bar{q}q$ condensation has increased by at least 10% with the α - α term included.

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Key words: condensation, the effect of quark mass, global color symmetry model

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