Contribution ID : **91**   Type : **Contributed (oral)**

A proposal of a local modified QCD

Friday, 8 June 2012 10:35 (0:20)

Abstract content

A local and renormalizable version of a modified PQCD introduced in previous works is presented. The construction indicates that it could be equivalent to massless QCD. The case in which only quark condensate effects are retained is discussed in more detail. Then, the appearing auxiliary fermion fields can be integrated, leading to a theory with the action of massless QCD, to which one local and gauge invariant Lagrangian term for each quark flavour is added. Those action terms are defined by two gluon and two quark fields, in a form curiously not harming power counting renormalizability. The gluon self-energy is evaluated in second order in the gauge coupling and all orders in the new quark couplings, and the result became transversal as required by the gauge invariance. The vacuum energy was also calculated in the two loop approximation and became gauge parameter independent. The possibilities that higher loop contributions to the vacuum energy allow the generation of a quark mass hierarchy as a flavour symmetry breaking effect are commented. The decision on this issue needs for a further evaluation of more than two loop contributions, in which more than one type of quark loops start appearing, possibly leading to interference effects in the vacuum energy.

Primary author(s) :   Dr. CABO, Alejandro (Departamento de Fisica Teorica, ICMF)

Presenter(s) :   Dr. CABO, Alejandro (Departamento de Fisica Teorica, ICMF)

Session Classification :   Flavour and QCD

Track Classification :   Particles