Quark Confinement and the Hadron Spectrum XI



Contribution ID: 109 Type: not specified

Dynamical QCD string and its symmetries

Thursday 11 September 2014 15:30 (30 minutes)

Mesons constructed from the quark propagators without the lowest-lying eigenmodes of the Dirac operator reveal not only restored chiral and U(1)_A symmetries, but actually a higher symmetry. All possible chiral and U(1)_A multiplets for the states of the same spin are degenerate, i.e. the energy of the observed quantum levels does not depend on the spin orientation of quarks and their parities. The quark-spin independence of the energy levels implies absence of the magnetic interactions in the system. The ultrarelativistic quark-antiquark system with only the color-electric interactions can be interpreted (or defined) as a dynamical QCD string. The symmetry group of the J>=1 levels of the string is SU(4).

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Session Classification: Parallel I: A6 Vacuum structure and confinement

Track Classification: Section A: Vacuum Structure and Confinement