

## **Quark confinement as nonlinear phenomenon in QCD vacuum**

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In the framework of stochastic QCD vacuum model we show that colour particle loss its colour propagating through QCD vacuum medium. At large distances colour disappear completely.

## **Testing of quark-hadron duality via the Adler D-function**

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A key problem in making precise perturbative QCD predictions, which connects with the requirement of renormalization group invariance, is the uncertainty in fixing the renormalization scale. We study the scale dependence of fresh four-loop QCD corrections to some processes both within the standard perturbative and singularity-free analytic perturbation theory. We demonstrate that within the analytic approach the results are practically renormalization scale independent and lead to rather different  $Q^2$  evolution than the standard perturbative correction possesses.

## **Berwald-Lagrange scalar curvature in the structure process of LB-monolayer**

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In this talk we examine a geometric 2D-dynamics of Langmuir-Blodgett monolayer (LB-monolayer). To do it the vertical component of Berwald curvature tensor is calculated, and the Berwald-Lagrange flag curvature  $K$  is determined. A simulation is performed, and possible physical interpretations are also given. It was established that sign change of  $K$  from positive to negative occurs at the compressing. The dependence of  $(-K)$  on an area of monolayer behaves similar to an isotherm of compressing in the neighbourhood of phase transition. Convolution of the vertical component of Berwald curvature tensor -- Douglas tensor  $B^i_{jkl}$  with metric tensor was calculated. An anomalous behavior of the convolution is similar to a behavior of susceptibility at phase transition.