VARIATIONAL PERTURBATION THEORY: NONPERTURBATIVE CALCULATIONS IN QCD

O. P. Solovtsova
ICAS, Gomel State Technical University, Belarus
E-mail: solovtsova@gstu.gomel.by

We present a nonperturbative method in QCD which is based on the variational perturbation theory (VPT). It is shown that within this method, which is complemented by the relativistic threshold factor, it is possible to obtain a good agreement between theoretical result and experimental data for various physical quantities (renormalization group invariant Adler functions, hadronic contributions to anomalous magnetic moments of leptons and so on). We find out that the reason of a good consent is connected with quark-hadron duality. The Borel transform is the useful mathematical trick, which is used for QCD sum rule treatment. By using the VPT, we construct a Borel representation of the Adler function and compare a result obtained with the OPE prediction and with an 'experimental' curve constructed from the tau-data. We determine the residual condensates and show that within the method suggested the optimal values of these lower dimension condensates are close to zero.