



UZ9700580

# Spectroscopy of Pseudoscalar and Vector Mesons and Their Electroweak Decays

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Proceeding from the effective action of QCD for bilocal meson fields the formula for the action describing the spectroscopy of mesons and their electroweak decays is obtained.

The numerical solutions of the Salpeter equation (SE) for the  $\bar{q}q$ -bound state and the Schwinger-Dyson equation (SDE) for the quark phase function are obtained with potential as sum of the oscillator and Coulomb terms. It is shown that for the oscillator potential and current quark mass  $m^0 \ll 300 \text{ MeV}$  the nontrivial solution of the SDE, which describes the spontaneous breakdown of the chiral symmetry effects and arising of the constituent quark mass, exists.

Using the potential mentioned above the spectroscopy of pseudoscalar mesons is described and is shown that one reproduces the experimental data on a qualitative level. However, the values obtained for leptonic decay constant of charged pion  $f_\pi$  and width of the two-photon annihilation of neutral pion  $\Gamma(\pi^0 \rightarrow \gamma\gamma)$  are 3-4 times smaller than their experimental ones. This discrepancy does not been removed even choosing of other shapes of the potential. In order to resolve of this problem the modification of the SDE, which consists in introducing to one the additional terms that did not changed asymptotical properties of solutions of this equation, is proposed. Using such modification both constant  $f_\pi$  and  $\Gamma(\pi^0 \rightarrow \gamma\gamma)$  are reproduced on a good quantitative level.

The new SE for vector mesons is proposed and solving one with potential mentioned above the masses spectra of these mesons are calculated. Considering the  $\tau \rightarrow \rho\nu$  decay the representation for leptonic decay constant of  $\rho$  meson  $f_\rho$ , which expresses via solutions of the SDE and the SE we suggested with a given potential, is obtained. It is shown that the proposed SE allows to describe both the spectroscopy vector mesons and their leptonic decay constants on a satisfactory level with their experimental values.