

Charge pion form factor in the Bethe-Salpeter approach with separable kernel

The charge pion form factor is calculated using the solution of the integral equation of Bethe-Salpeter for a quark-antiquark system. The phenomenological interaction potential in a separable form (rank 1) is used to solve the equation. When calculating the charge pion form factor, the contributions of a one-particle current (relativistic impulse approximation) and a two-particle interaction current are taken into account. The resulting expressions are four-dimensional integrals with poles of the first and second order. Integrals are calculated numerically by two different methods: the Feynman parameterization method and the Cauchy theorem method. The charge form factors calculated by two methods coincide within the statistical accuracy. The physical constants of the pion decay are also calculated. The dependence of the charge form factor on the model parameters and the type of vertex function is investigated. In addition, comparisons of the obtained results with experimental data are given.

Section

Nuclear structure: theory and experiment

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