

Light quark masses in $1/N_c$ chiral perturbation theory

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Abstract

The mass formulas for the pseudoscalar $\pi^\pm, K^\pm, K^0(\bar{K}^0)$ mesons, obtained in the NLO approximation of the combined expansion in momenta, quark masses m_q and $1/N_c$, allow us to conclude that the ratios m_u/m_d and m_s/m_d belong to a third-order algebraic curve. It is shown that taking into account higher-order corrections does not affect the shape of the curve. Data on the constants of the effective Lagrangian, obtained from lattice calculations, allow us to determine the quark masses.