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Contribution of the sea quark pairs to the electromagnetic decay of S-wave baryons problem

Abstract

In this work is presented the electromagnetic decay of baryons problem, where the current experimental data for the radiative decay width shows that these values are approximately two times larger than the predictions of the constituent quark model. The main aim is to solve this problem with the approach of effective degrees of freedom for quarks in the quark model, considering also the sea quarks, obtaining the valence quark and the first term of the sea quarks contributions. For it has been considered an unquenched quark model where are incorporated the effects of the quark-antiquark sea pairs with the quantum numbers of vacuum in the wave function for baryons as terms type baryon-meson with quantum numbers coupled with the quantum numbers of the original baryon. In order to do this is taken the $^3P_0$ model for the creation of pairs quark-antiquark and considering the effect as a perturbation in the wave function of baryons. It has also obtained a more general expression for the electromagnetic decay width in quark models such that considers valence and sea quarks in terms of the transition magnetic moments.

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