Baryon spectroscopy in the unquenched quark model

Monday 25 September 2017 14:55 (20 minutes)

The constituent quark model (CQM) describes the nucleon as a system of three constituent, or valence, quarks. Despite the successes of the CQM (e.g. masses, electromagnetic couplings, and magnetic moments), there is compelling evidence for the presence of sea quarks from other observables such as the observed flavor asymmetry of the proton, the proton spin crisis, and the systematics of strong decays of baryons.

In this contribution, I present the unquenched quark model as an extension of the CQM that includes the effects of sea quarks via a ${}^{3}P_{0}$ quark-antiquark pair-creation mechanism. Particular attention is paid to the spin and flavor content, magnetic moments, and β decays of baryons. as well as the strangeness suppression in the proton. It is shown that the observed discrepancies between the experimental data and the predictions of the CQM can be accounted for in large part by the effects of sea quarks in the unquenched quark model.

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Track Classification: Spectroscopy of baryons