Diquarks in hadron spectroscopy.

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Abstract

The diquark is a system of two strongly correlated quarks. Obviously no free diquarks can exist, since they carry color. However they can theoretically form inside hadrons. While the actual possibility that two quarks can form stable bounds inside hadrons is still discussed, the use of a diquark effective degree of freedom can be very useful because it reduces the total number of states predicted and simplify the interactions inside hadrons. Here we present two possible application of the diquark.

The first is the tetraquark meson in the diquark-antidiquark limit. In this limit the tetraquark meson is composed of a diquark and an antidiquark. The complete set of states are constructed and a simple algebraic mass formula is applied in order to calculate the spectrum. The second application is the baryon in the quark-diquark model. Also in this case all the possible states are constructed and the spectrum is calculated through an algebraic mass formula, similar to the one used for the tetraquark, and compared with the experimental results.

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