Motivations

A simple diquark model captures the baryonic sector and explains the observed spectra of hyperons and their decays. In this work, we present the first lattice calculations for the baryonic sector, to complement the current experimental and theoretical results.

We decompose the EM current in the isospin 0 and 1 components and study the contribution of each component to the total electromagnetic form factors. We employ the leading isospin violating corrections in the EM matrix element and use NNLO ChPT to evaluate the hadronic contribution.

The lattice results are compared with the experimental data, and we find reasonable agreement. The calculated form factors are consistent with the experimental results, providing evidence for the validity of the diquark model.

References


Lattice background

The lattice approach provides an alternative to perturbative QCD and allows for the calculation of non-perturbative properties.

Preliminary results

The lattice results for the baryonic sector are in agreement with the experimental data and provide a valuable test for the diquark model. Further refinement of the lattice calculations is required to better match the experimental accuracy.

Phenomenology vs. Lattice QCD

The lattice results for the baryonic sector are compared with the phenomenological calculations, showing reasonable agreement.

Isospin decomposition

The EM current is decomposed into isospin 0 and 1 components, allowing for a detailed study of the EM form factors.

Below the diquark model, the baryonic sector can be studied using lattice QCD. The lattice results provide a valuable tool for testing the theoretical predictions and understanding the underlying QCD dynamics.