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Octet baryon charges with $N_f = 2 + 1$ non-perturbatively improved Wilson fermions

The axial charge of the nucleon, g_A , has been computed extensively on the lattice. However, the axial charges for other octet baryons (hyperons) such as the Σ and Ξ baryons are less well known experimentally and theoretically. Here we present results for the isovector axial, scalar and tensor charges, as well as for the second Mellin moments of isovector PDFs. The scalar charges are related to the difference between the physical up and down quark masses via the vector Ward identity which allows us to determine this splitting from our result of the scalar charge of the Σ baryon. Moreover, we compute the QCD contributions to baryon isospin mass splittings. Our calculations are performed on a large set of $N_f = 2 + 1$ CLS ensembles of non-perturbatively $\mathcal{O}(a)$ improved Wilson fermions with tree-level Symanzik improved gauge action.

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