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Helicity GPD for the proton using an asymmetric kinematic setup

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First lattice QCD calculations of x-dependent GPD have been performed in the Breit frame, where the momentum transfer is evenly divided between the initial and final hadron states. Employing the asymmetric frame proposed in PRD 106 (2022) 11, 114512, we are able to obtain proton GPDs for multiple momentum transfers in a computationally efficient setup. In this presentation, we focus on the helicity twist-2 GPD at zero skewness that gives access to the $\tilde{H}$ GPD. We will cover the implementation of the asymmetric frame, its comparison to the Breit Frame, and the dependence of the GPD on the four-vector momentum transfer squared. The calculation is performed on an $N_f = 2+1+1$ ensemble of twisted mass fermions with a clover improvement. The mass of the pion for this ensemble is roughly 260 MeV.

Topical area

Structure of Hadrons and Nuclei

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