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Angular momentum and generalized parton distributions for the proton on the light front

We study the unpolarized and the helicity dependent generalized parton distributions (GPDs) for the valence quarks of the proton in both momentum space and position space within the basis light-front quantization (BLFQ) framework. The GPDs for the valence quarks are computed from the eigenvectors of a light-front effective Hamiltonian in the valence Fock sector consisting of a three-dimensional confinement potential and a one-gluon exchange interaction with fixed coupling. Employing these GPDs, we obtain the spatial distributions of quark angular momentum inside the proton. In our BLFQ approach, we explore various definitions of angular momentum density and illustrate the differences between them arising from terms that integrate to zero. We also discuss the flavor contributions to the quark angular momentum densities.

Submitted on behalf of a Collaboration?

No

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