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Extraction of genuine twist three distribution from the global data

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Abstract

We perform an extraction of twist-three parton distribution functions (PDFs) through a joint fit of observables sensitive to higher-twist physics using world data. The results reveal flavor-dependent patterns and are distinct from zero at a statistically significant level of 2σ - 3σ . The results are shown to shed light on the internal dynamics of the nucleon structure, allowing a phenomenological study of higher twist effects by corroborating spin sum rules, the computation of the average transverse momentum displacement and the averaged transverse force acting on quarks inside the proton. The results agree with classical literature and current lattice computations.

