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Leading-twist Quark PDFs of the Nucleon from Ioffe-time Pseudo-distributions

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The Parton Distribution Functions (PDFs) encode the non-perturbative collinear dynamics of a hadron probed in inclusive and semi-inclusive scattering processes, and hence provide an avenue to address a number of key questions surrounding the structure of hadrons. This talk will summarize recent efforts of the HadStruc Collaboration to map out the leading-twist quark PDFs of the nucleon using Lattice QCD. This effort hinges on the computation of matrix elements of space-like parton bilinears, which factorize, akin to the QCD collinear factorization of hadronic cross sections, in a short-distance regime into the desired PDFs - ideas codified within the pseudo-distribution formalism. By exploiting the distillation spatial smearing paradigm, matrix elements of sufficient statistical quality are obtained such that the leading-twist PDFs and various systematic effects can be simultaneously quantified. Consistency of our obtained PDFs with phenomenological expectations is also explored.

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