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x -dependence of nucleon PDFs from two-current matrix elements

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We use the operator product expansion (OPE) to relate hadronic Euclidean two current matrix elements to parton distribution functions (PDFs) resolving the dependence on the parton momentum fraction x . We are following the ansatz proposed by [arXiv:1709.03018]. In our calculation, we consider the valence quark PDFs for the proton. This requires the evaluation of a connected proton four-point function for small quark distances. Our simulation is performed on $n_f = 2 + 1$ CLS gauge ensemble with extension $32^3 \times 96$, coupling $\beta = 3.4$, and pseudo-scalar masses $m_\pi = 355$ MeV and $m_K = 441$ MeV, where we include proton momenta up to $|\vec{p}| = 1.57$ GeV. The results are converted to the $\overline{\text{MS}}$ -scheme at the scale $\mu = 2$ GeV. In order to extract the PDF, the data is fitted in Fourier space based on a standard parameterization of the PDF.

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