Towards High-Precision Parton Distributions From Lattice QCD via Distillation COLIN EGERER, William Mary, CHRISTOS KALLIDONIS, Thomas Jefferson National Accelerator Facility, KONSTANTINOS ORGINOS, Thomas Jefferson National Accelerator Facility, William Mary, ANATOLY RADYUSHKIN, Thomas Jefferson National Accelerator Facility, Old Dominion University, DAVID RICHARDS, Thomas Jefferson National Accelerator Facility, SAVVAS ZAFEIROPOULOS, Aix Marseille University, HADSTRUC COLLABORATION[1] — The pseudo-distribution formalism is one such lattice methodology capable of extracting light-cone distributions from matrix elements of suitably constructed Euclidean non-local operators of a spacelike extent. Leveraging the distillation spatial smearing program, we extract the unpolarized isovector valence quark PDF of the nucleon via a direct 1-loop matching of the Ioffe-time pseudo-distribution and model PDFs. We benchmark the efficacy and systematics inherent to this choice by also extracting the PDF from the matched light-cone Ioffe-time distribution. The tempering of excited-states and improved spatial sampling afforded by distillation lead to higher-quality Ioffe-time distributions relative to the literature, and exhibit DGLAP evolution in the short-distance regime. We explore the role of higher-twist effects by extending the spacelike Wilson lines present in our calculation to regimes wherein polynomial-z^2 corrections are expected to be large. Comparisons are made between PDFs extracted from our analysis and those from phenomenological determinations.

[1]Authors presenting on behalf of members of the HadStruc Collaboration.

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