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Continuum limit of the unpolarized gluon PDF using twisted-mass fermions

Gluons play a central role in the proton's structure, carrying a substantial fraction of its momentum and driving its dynamics at small Bjorken-x. A precise determination of the unpolarized gluon parton distribution function (PDF) from first principles is essential for understanding QCD and for reducing uncertainties in high-energy collider predictions. In this talk, we extend our work on the unpolarized gluon PDF to a continuum limit extraction. We use four $N_f = 2 + 1 + 1$ ensembles of maximally-twisted clover fermions and Iwasaki improved gluons at higher than physical pion mass with lattice spacings $a = 0.094$, 0.079, 0.069, and 0.057 fm. We provide an analysis of excited-state effects and compare our PDF to global fitting results.

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