



Contribution ID: 43

Type: **not specified**

Proton's isovector PDF with updated analysis of large-momentum lattice data

Monday, 6 July 2026 13:00 (30 minutes)

The proton's unpolarized $u(x) - d(x)$ parton distribution function (PDF) has been studied by a number of lattice QCD groups through large momentum expansion. However, due to lattice artifacts (excited state contaminations, unphysical pion masses, and discretization effects) and less-advanced theoretical analysis (renormalizations, large-distance extrapolations, and large-log resummations), the resulting PDFs cannot be compared strictly with experimental data. By using the state-of-the-art theoretical tools and mitigating the lattice artifacts empirically, we reanalyze the available datasets in the literature and find that the new PDF in physical limits are consistent with global fittings within 1σ . This provides compelling evidence that large momentum expansion is capable of accurately predicting the x -dependence of the PDFs when ideal lattice data become available.

Primary authors: JI, Xiangdong (University of Maryland, College Park); SU, Yushan (University of Maryland, College Park)

Presenter: SU, Yushan (University of Maryland, College Park)

Session Classification: Session I