

Light cone parton distributions from lattice quantum chromodynamics

Wednesday, 7 June 2023 14:30 (20 minutes)

The light-cone definition of Parton Distribution Functions (PDFs) does not allow for a direct ab initio determination employing methods of Lattice QCD simulations that naturally take place in Euclidean spacetime. In this presentation we focus on pseudo-PDFs where the starting point is the equal time hadronic matrix element with the quark and anti-quark fields separated by a finite distance. We focus on Ioffe-time distributions, which are functions of the Ioffe-time v , and can be understood as the Fourier transforms of parton distribution functions with respect to the momentum fraction variable x . We present lattice results for the case of the nucleon and the pion addressing among others the physical point and continuum extrapolations. We also incorporate our lattice data in the NNPDF framework treating them on the same footing as experimental data and discuss in detail the different sources of systematics in the determination of the non-singlet PDFs.

Finally, we will present the latest results of the HadStruc collaboration on the gluon, helicity and transversity PDF of the nucleon.

Primary author: ZAFEIROPOULOS, Savvas (CNRS and Aix Marseille University)

Co-authors: RADYUSHKIN, Anatoly; MONAHAN, Christopher; EGERER, Colin; RICHARDS, David; ROMERO, Eloy; KARPIE, Joseph; ORGINOS, Kostas (College of William and Mary / JLab); SUFIAN, Raza; EDWARDS, Robert

Presenter: ZAFEIROPOULOS, Savvas (CNRS and Aix Marseille University)

Session Classification: QCD and hadron structure

Track Classification: QCD and hadron structure