

Seminarium Zakładu Fizyki Teoretycznej

Departament Badań Podstawowych
Narodowego Centrum Badań Jądrowych

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pawilon NCBJ, sala 22, Hoża 69

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"RECONSTRUCTION OF LIGHT-CONE PARTON DISTRIBUTION FUNCTIONS FROM LATTICE QCD SIMULATIONS AT THE PHYSICAL POINT"

ABSTRACT:

This talk will be divided into two parts. First, I will provide a general introduction to the non-perturbative formulation of QCD on a Euclidean lattice. Then, I will present a state-of-the-art computation of unpolarized and helicity parton distribution functions calculated using the so-called quasi-PDF approach introduced by Xiangdong Ji in 2013 and intensively developed thereafter. To obtain these results, we employed lattice QCD simulations with physical values of the light quark mass. The relevant matrix elements obtained on the lattice were then non-perturbatively renormalized and converted to the \overline{MS} scheme at a scale of 2 GeV. A matching process was applied together with target mass corrections, leading to the reconstruction of light-cone parton distribution functions. For both cases we found a similar behavior between the lattice and phenomenological data, and for the polarized PDF a nice overlap for a range of Bjorken- x values. This presents a major success for the emerging field of direct calculations of quark distributions using lattice QCD.

Serdecznie zapraszamy,

M. Kowal, W. Piechocki, L. Roszkowski, J. Skalski, L. Szymanowski