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3D Imaging of the Nucleon in Lattice QCD

Thursday, 30 March 2023 17:10 (20 minutes)

The transverse-momentum-dependent parton distributions (TMDs) provide a 3D imaging of the proton and other hadrons in high-energy scattering experiments, such as those at Fermilab, Jefferson Lab, RHIC and LHC. Recent years have seen significant progress in the global fitting of TMDs from experiments, and along with that is a lattice QCD program aiming at first-principles calculation of these quantities in the non-perturbative domain. Thanks to the breakthroughs in theory, especially the large-momentum effective theory (LaMET), it is now feasible to calculate both quark and gluon TMDs from a set of lattice TMDs through perturbative matching. In this talk, I will introduce the LaMET approach to solve for TMDs, and discuss the factorization formula that relates physical TMDs from lattice calculable quasi TMDs, which has enabled recent progress in calculating the Collins-Soper evolution kernel and the full TMD.

Submitted on behalf of a Collaboration?

No

Participate in poster competition?

No

Primary author: ZHAO, Yong

Presenter: ZHAO, Yong

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