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Flash talk: Collins-Soper kernel from lattice QCD at the physical pion mass

Monday 9 January 2023 13:45 (10 minutes)

Collins-Soper (CS) evolution kernel is necessary to relate transverse-momentum-dependent parton distribution functions (TMDPDFs) at different scales. The kernel's behavior at high as well as low transverse momenta q_T may lead to sizable variations in the uncertainty estimates for m_W. For $q_T \sim \Lambda_{\rm QCD}$, the CS kernel is non-perturbative; the determination of the CS kernel in the non-perturbative regime can only be done through experiment or first-principles calculations. Here, preliminary results are presented for a new calculation of the non-perturbative CS kernel using lattice QCD and Large-Momentum Effective Theory. This work improves the control over and reduces the systematic uncertainties compared to previous lattice QCD calculations, and is the first computation at close-to-physical valence and sea pion masses ⊠⊠≈140 MeV.

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