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Perturbative calculations for first-principle parton distribution functions

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Parton distribution functions (PDFs) are of key interest in both particle and nuclear physics. At the LHC, the limited knowledge of PDFs is currently one of the leading bottlenecks in precise predictions. In nuclear physics, PDFs provide insight into the structure of the nucleon, towards more complicated systems.

In this talk I will first motivate the need for precise PDFs, then explain how the quasi- and pseudo-PDF frameworks provide access to PDFs on the Euclidean lattice from first principles. A crucial ingredient are perturbative calculations of the matching kernel to map Euclideanized PDFs to light-cone PDFs. I will present our one-loop calculation of gluon quasi- and pseudo-PDF matching kernels, which contributes to a more precise gluon distribution and paves the way for higher-order calculations and different schemes.

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