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Spatially dependent nPDFs and their applications in inclusive pion and prompt photon production

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I will focus on the nuclear PDFs (nPDFs) and their applications in high energy A+A and p/d+A collisions. First, I will introduce our recently published spatially dependent nPDF sets, EPS09s and EKS98s, and discuss the centrality dependence of hard-process cross-sections within the collinear factorization framework. More specifically, I will compare our NLO pQCD calculations for the nuclear modification factor of neutral pion and prompt photon production with the data in d+Au and Au+Au collisions at RHIC and for p+Pb and Pb+Pb collisions at the LHC at midrapidity in different centrality classes. These calculations are found to be well in line with the published data. After this, I will discuss the same observables also at forward rapidities and show to what extent these will probe the small-x gluon densities in p+Pb collisions at the LHC. In addition, we have implemented the spatially dependent nPDFs into a Monte-Carlo Glauber framework to study whether the centrality dependence turns out to be different (stronger) than with the optical Glauber model used so far.

Keywords

nPDF, proton-lead collisions, prompt photons, nuclear modification factor

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