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Implementation of NLO high energy factorization in single inclusive forward hadron production

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Single inclusive particle production cross sections in high energy hadron collisions at forward rapidity are an important benchmark process for the CGC picture of small x QCD. Recent calculations of this process have not led to a stable perturbative expansion for this quantity at high transverse momenta. We consider the quark channel production cross section using the new rapidity factorization procedure proposed by Iancu et al. We show that for fixed coupling one does indeed obtain a physically meaningful cross section which is positive and reduces in a controlled way to previous leading order calculations. We then discuss why it is difficult to use a running coupling prescription consistent with existing fits of the initial condition for the BK evolution of the target.

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