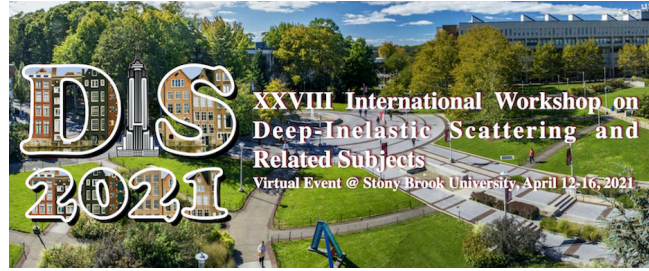


# XXVIII International Workshop on Deep-Inelastic Scattering and Related Subjects



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## Drell-Yan $p_T$ with NLO-matched Parton Branching TMDs at energies from fixed-target to LHC

*Tuesday, 13 April 2021 12:36 (15 minutes)*

The description of the Drell-Yan (DY) transverse momentum spectrum requires matching of fixed order QCD calculations with soft gluon resummation up to all orders in the QCD coupling. It has been noticed in the literature that a consistent description of DY data in a wide kinematic regime from fixed-target to LHC energies is problematic. In this talk the predictions for transverse momentum spectrum of DY data coming from experiments in very different kinematic ranges (NuSea, R209, Phenix, LHC 8 TeV and 13 TeV center-of-mass energies  $\sqrt{s}$ ) are calculated by applying transverse momentum dependent (TMD) parton distributions obtained from the Parton Branching (PB) method, combined with the next-to-leading-order (NLO) calculation of the hard process in the MCatNLO method. We discuss the problems involved in matching of the fixed order calculation and resummation, especially in the moderate to low mass and  $p_T$  region accessible at fixed target experiments. We find that at low DY mass and low  $\sqrt{s}$  even in the region of  $p_t/m_{DY} \sim 1$  the contribution of multiple soft gluon emissions (included in the PB-TMDs) is essential to describe the measurements, while at larger masses and LHC energies the contribution from soft gluons in the region of  $p_t/m_{DY} \sim 1$  is small.

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