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Update on fits with dynamical z_{max} at NLO

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Uncertainties for dynamical z_{max} at NLO with two different $q_0 = 0.5$ & 1.0 GeV

- Our preliminary results for the fit with uncertainty band for two different q_0 values

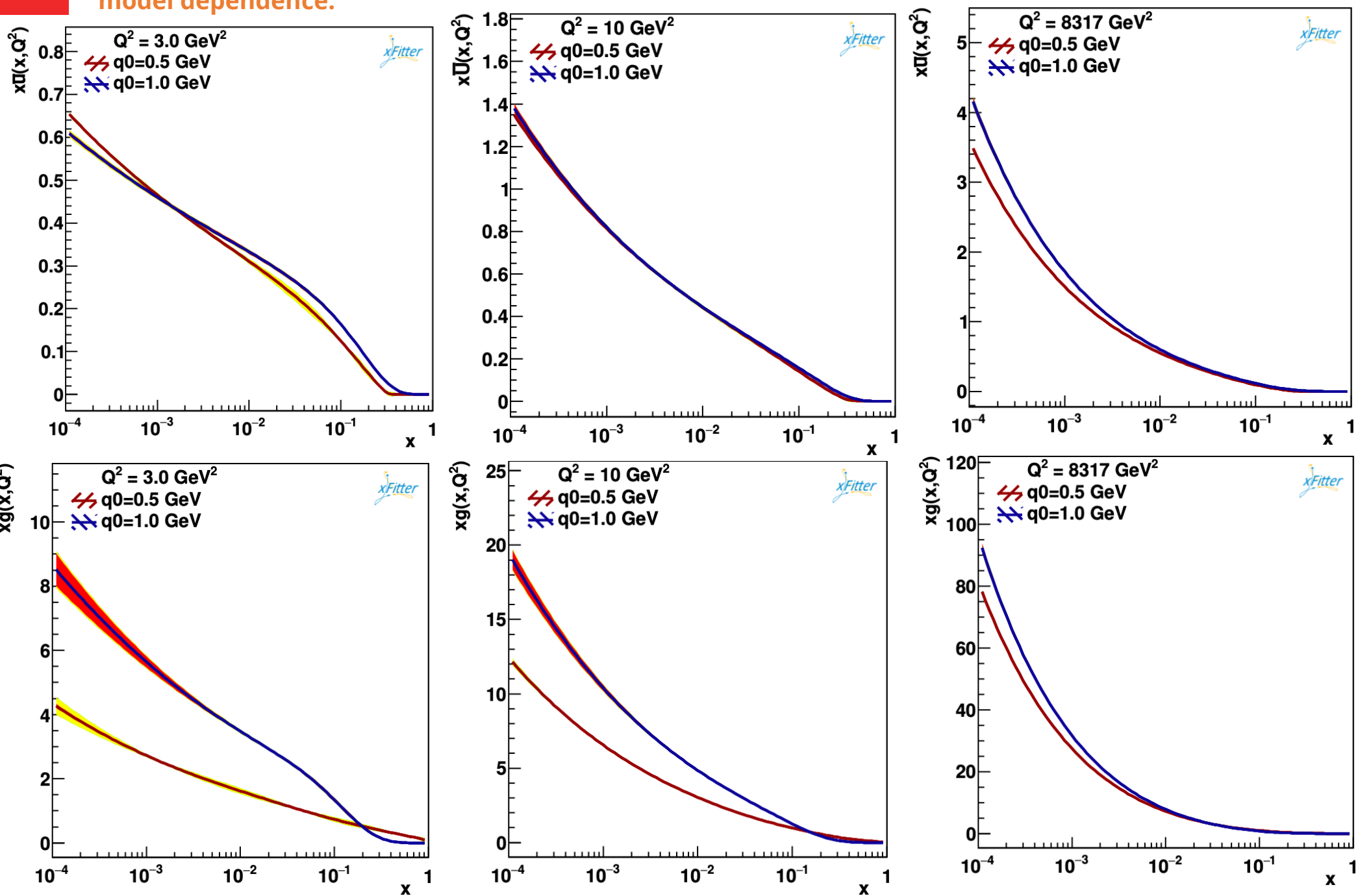
Dynamical Zmax NLO with $q_0 = 0.5\text{GeV}$ ($Q^2_{\text{min}}=3.5$)			
	χ^2	d.o.f	$\chi^2 / \text{d.o.f}$
$\mu_0^2 = 1.9 \text{ GeV}^2$	1424	1131	1.25

Dynamical Zmax NLO with $q_0 = 1.0\text{GeV}$ ($Q^2_{\text{min}}=3.5$)			
	χ^2	d.o.f	$\chi^2 / \text{d.o.f}$
$\mu_0^2 = 1.9 \text{ GeV}^2$	1555	1131	1.37

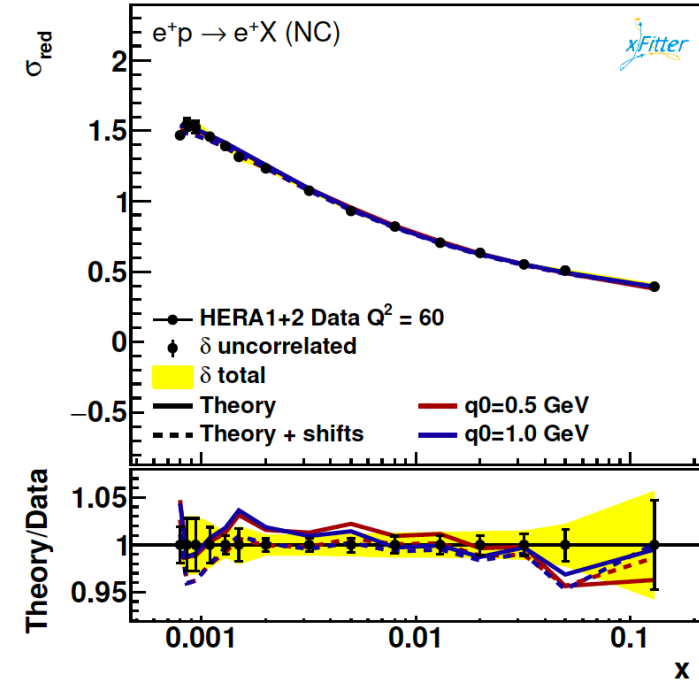
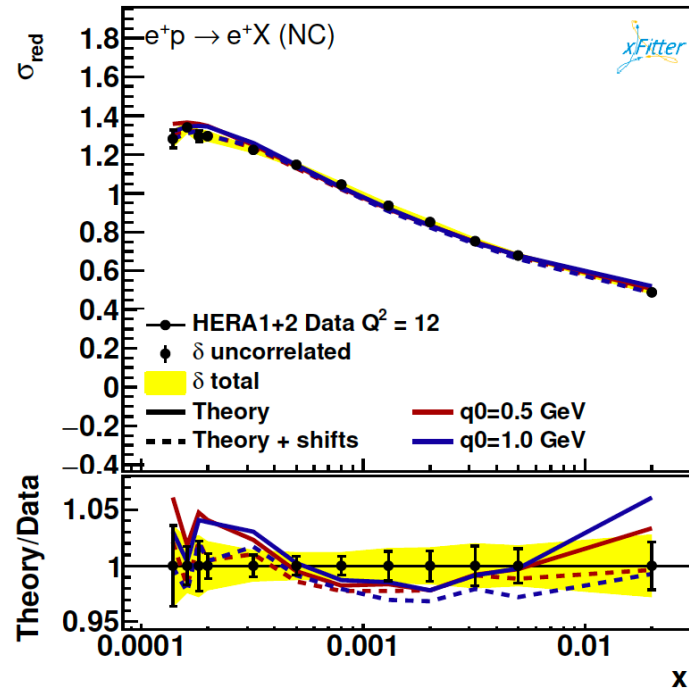
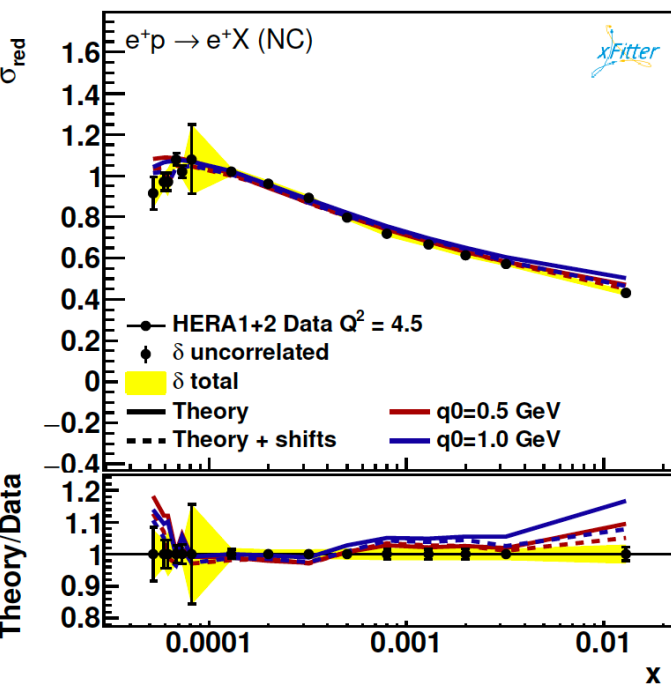
- Uncertainty band includes variation of bottom mass, charm mass and the value of evolution starting scale (QG).

- The cut that we applied in α_s is $q_0 \rightarrow \alpha_s (q_t \geq q_0)$

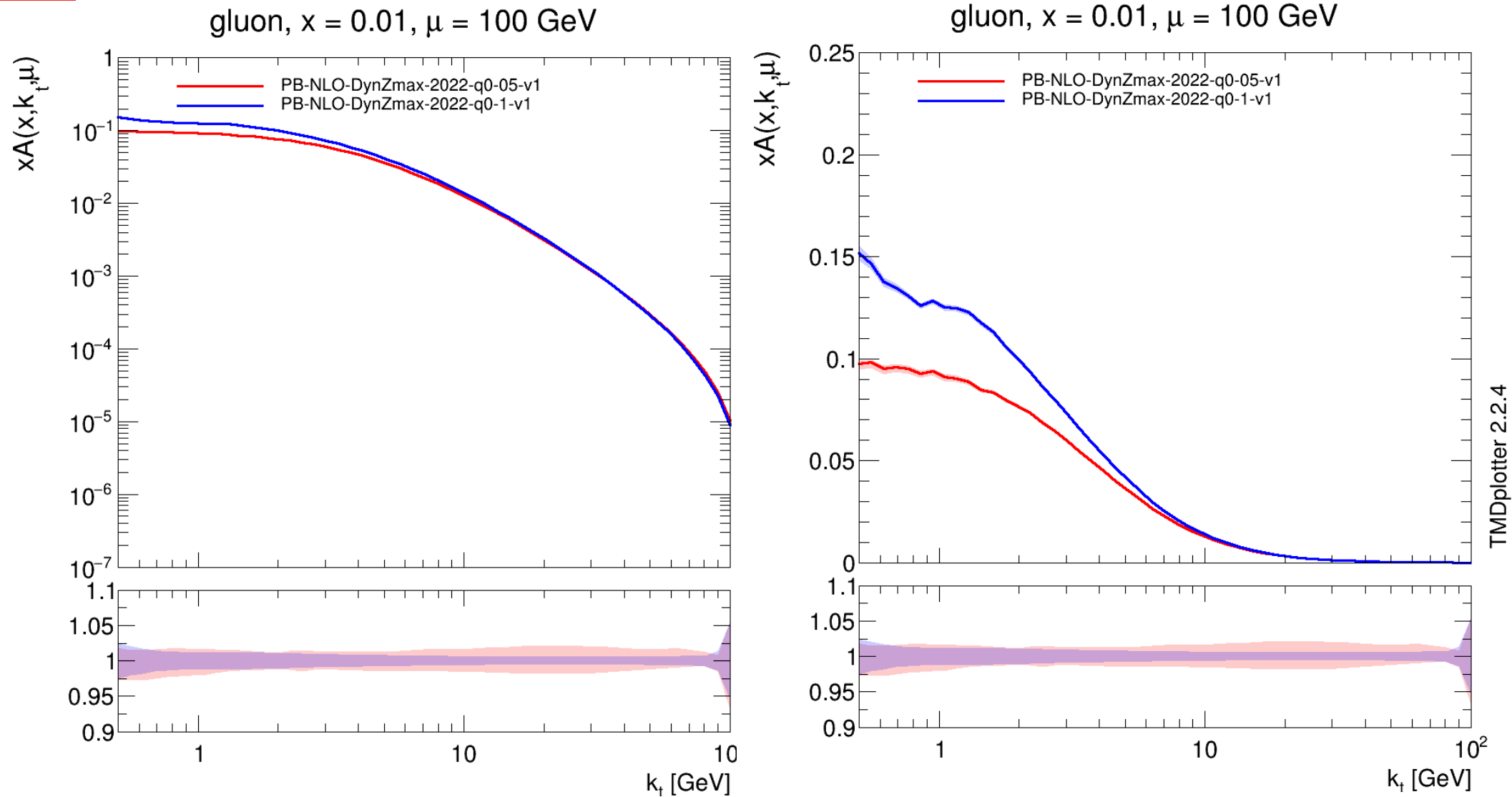
Parton densities for different values of the scale $\mu^2 = Q^2$. The different choices for $q_0=0.5$ & 1.0GeV are shown. **The red band shows the experimental uncertainty, the yellow band the model dependence.**



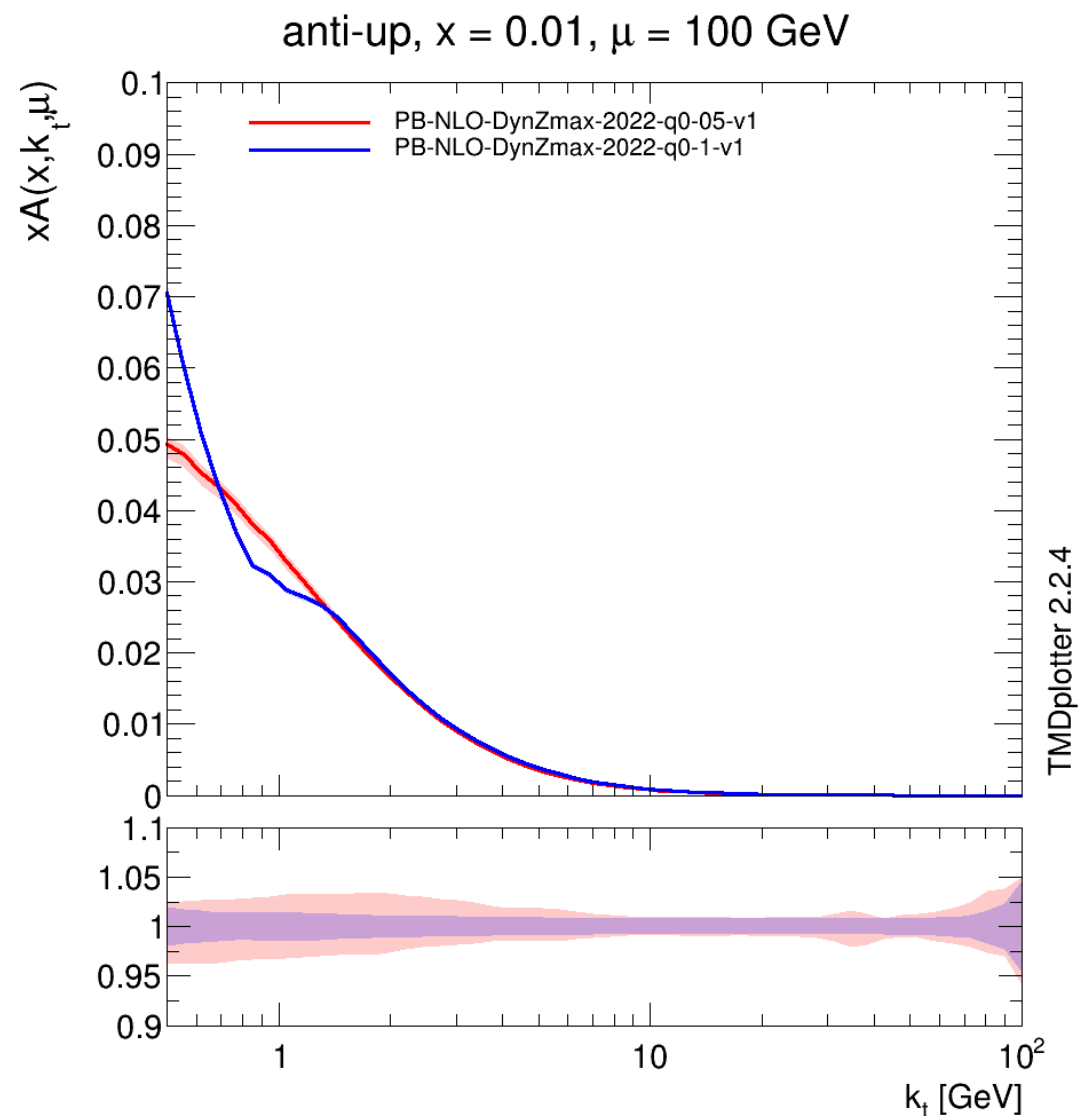
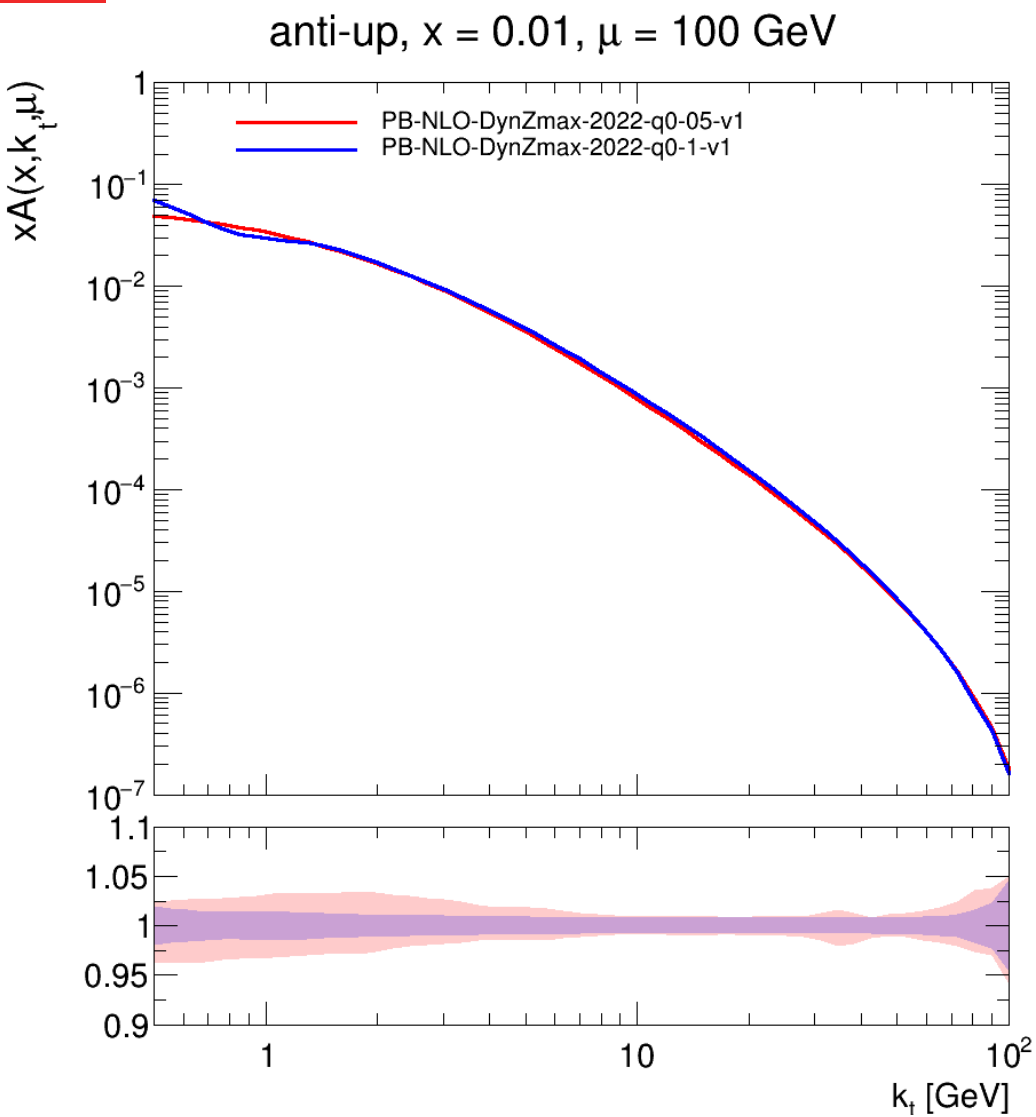
Measurement of the reduced cross section obtained at HERA compared to predictions using $q_0 = 0.5$ & 1.0 GeV



TMD Uncertainties plots with $q_0=0.5$ & 1.0 GeV



TMD Uncertainties plots with $q_0=0.5$ & 1.0 GeV



A few questions in this regard:

1. For obtaining uncertainty band for upper and lower values of QG, should we change these two parameters(Q02 & Q2val) in the steering file as well?

```
Order = 'NLO'          ! 'LO', 'NLO' or 'NNLO', used for D
Q02    = 1.9 ! Evolution starting scale

! --- Scheme for heavy flavors
! --- HF_SCHEME = 'ZMVFNS'           : ZM-VFNS (massless)
! --- HF_SCHEME = 'ZMVFNS MELA'      : ZM-VFNS (massless)
! --- HF_SCHEME = 'RT'               : Thorne-Roberts VF
! --- HF_SCHEME = 'RT FAST'          : Fast approximate

! -- Q2 values at which the pdfs & errors are done (up to
! Q2VAL = 1.9, 3.0, 4.0, 5., 10., 100., 6464, 8317
! Q2VAL = 1.9, 4., 10., 100., 6464, 8317
Q2VAL = 1.9, 3 , 5., 10., 100., 6464, 8317

! How many x points to write (standard = 101)
OUTNX = 101

! x-range of output (standard = 1E-4 1.0)
OUTXRANGE = 1E-4, 0.9999
&End
```

2. Should we also change these parameters for masses of bottom and charm quarks in the electroweak file?

```
! Light quark masses:
mup          = 0.06983d0
mdn          = 0.06983d0
mst          = 0.150d0

! Heavy quark masses:
mch          = 1.47d0    ! Synchronize with QCDNUM,RT
mtp          = 173d0     ! Synchronize with QCDNUM
mbt          = 4.5d0     ! Synchronize with QCDNUM,RT
```

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