



REINVENT

Radish updates

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Setup for level2

Central scales

Renormalization and factorization scale

$$\mu_R = \mu_F = m_{\ell\ell}$$

Resummation scale (to probe subleading logarithmic corrections)

$$Q = \frac{m_{\ell\ell}}{2}$$

Normalisation (unitarity) constraint: resummation scale Q such that the integral of the spectrum at fixed μ_R, μ_F does not change

Scale variations

Scale uncertainties estimated by

- varying renormalization and factorization scale by a **factor of 2** around their central value with $1/2 \leq \mu_R/\mu_F \leq 2$ (7 point variation)
- varying the resummation scale by a **factor of 2** around its central value for factorization and renormalization scales set to their central value
- **9 point envelope**

Setup for level2

Modified logarithms

To ensure that resummation does not affect the hard region of the spectrum **when the matching is performed** we introduce **modified logarithms**

$$\ln(Q/k_{t1}) \rightarrow \frac{1}{p} \ln \left(1 + \left(\frac{Q}{k_{t1}} \right)^p \right)$$

p : arbitrary matching parameter

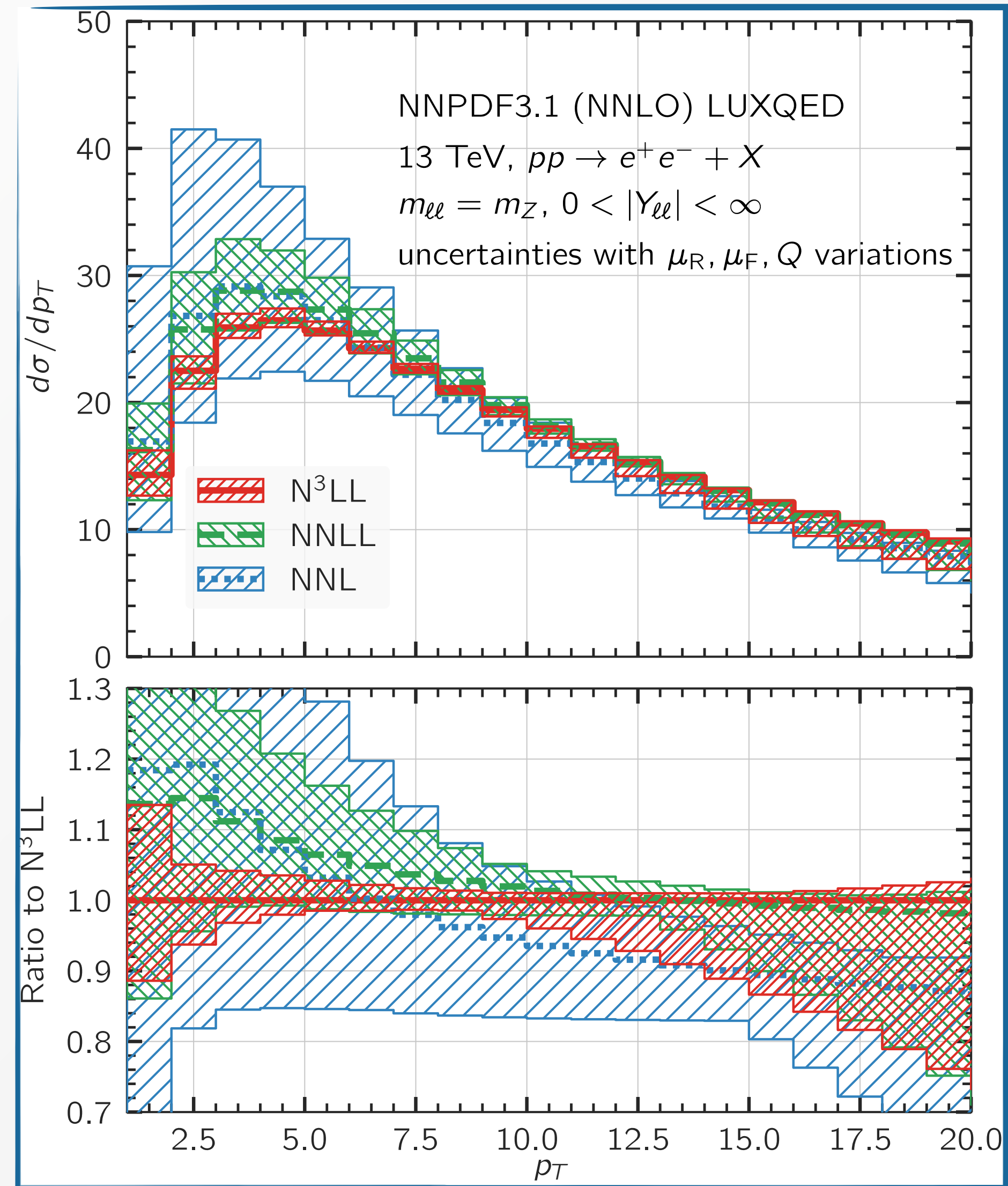
Default value $p = 4$

chosen such that it does not affect the fixed order scaling at large p_T

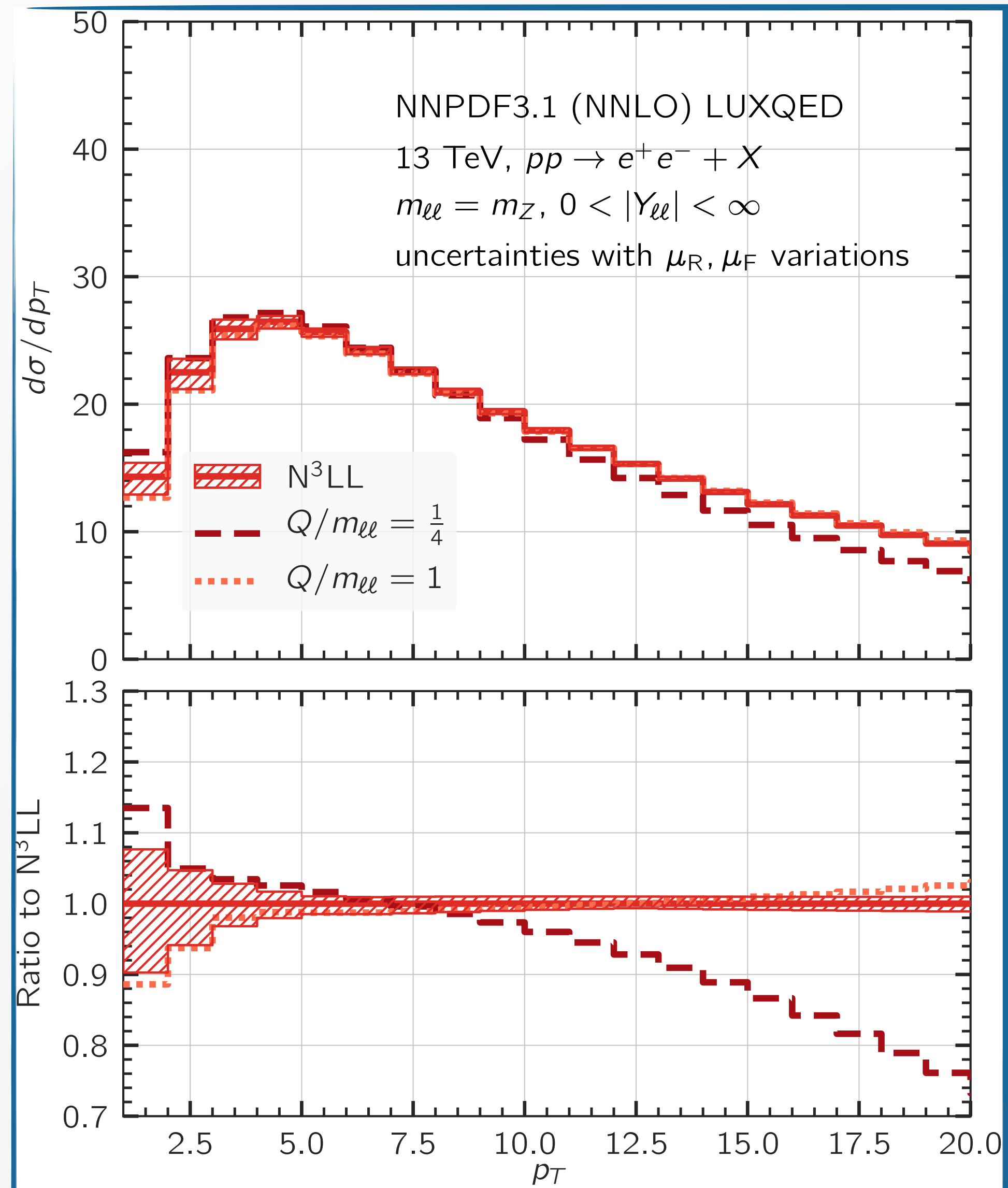
This corresponds to restricting the rapidity phase space at large k_t

$$\int_{-\ln Q/k_t}^{\ln Q/k_t} d\eta$$

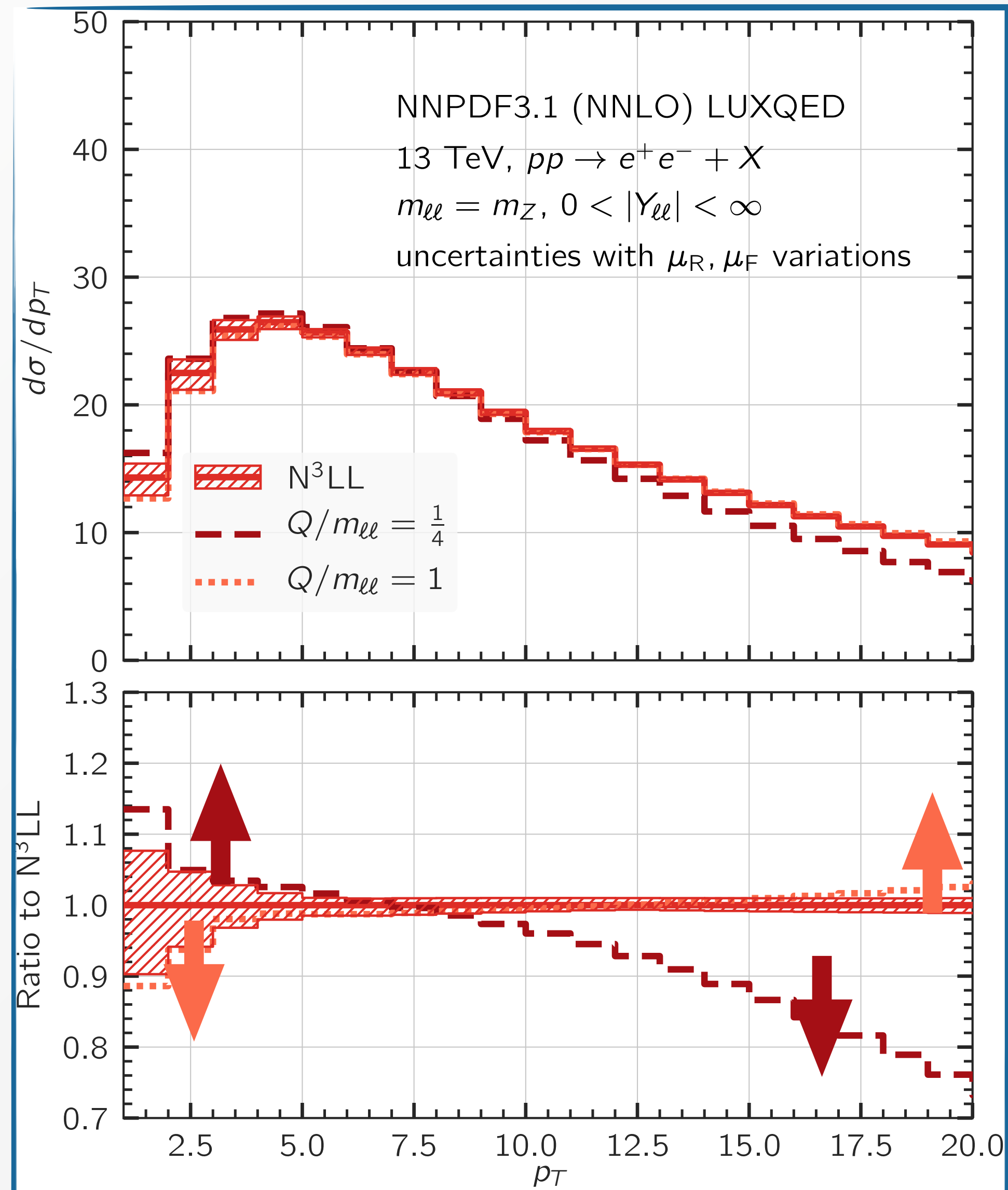
Results



Results



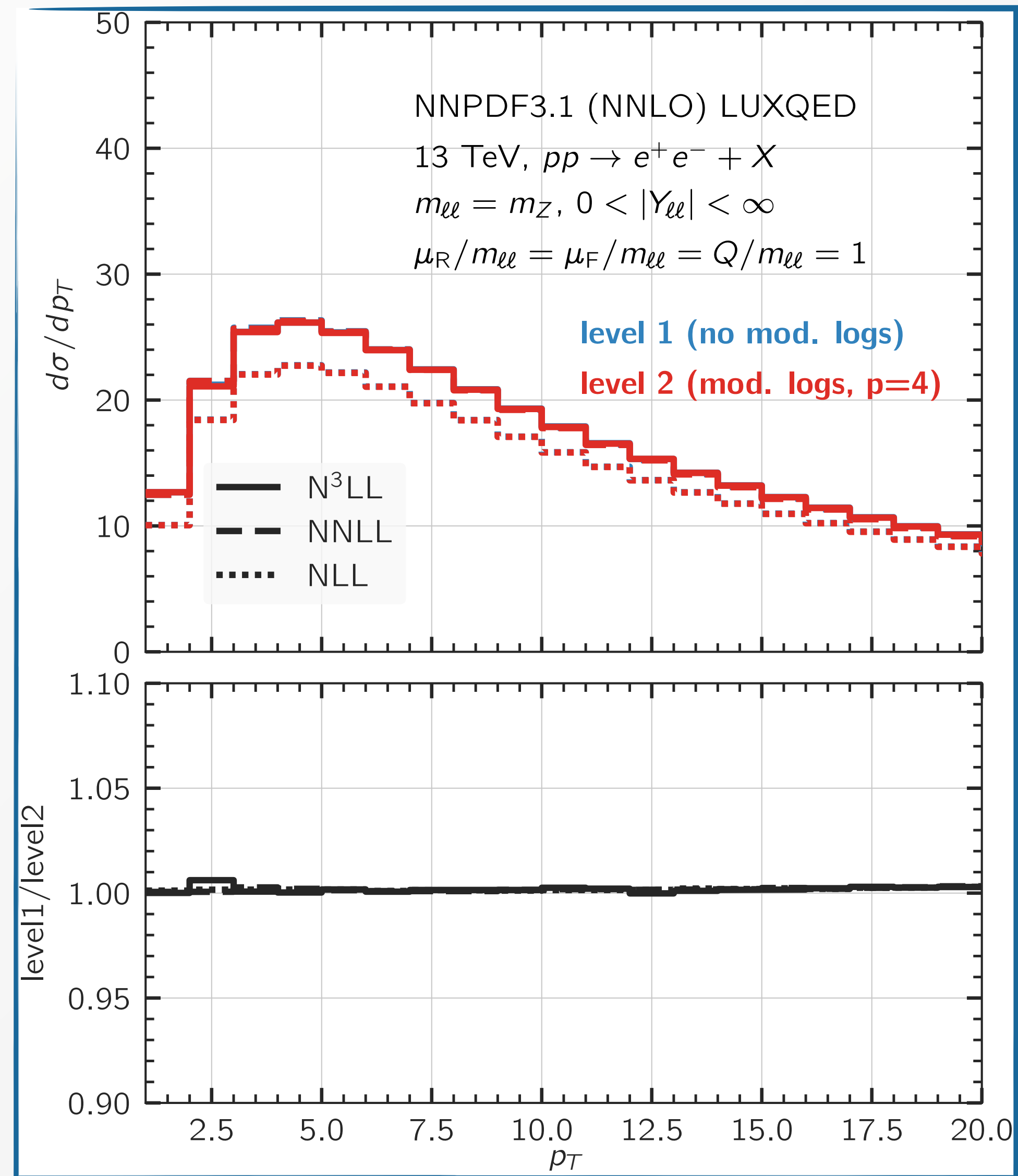
Results



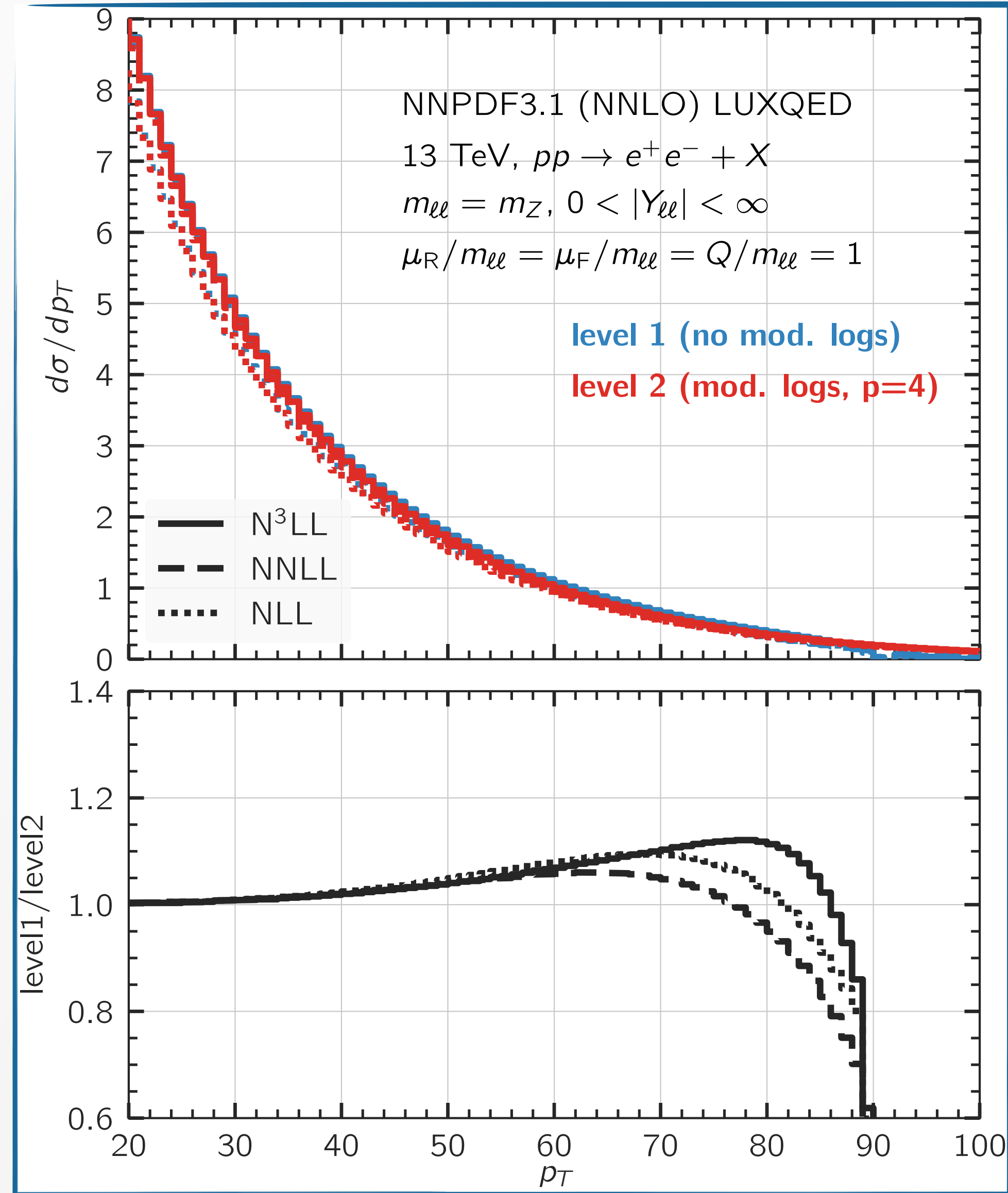
Unitarity constraint

N.B. effect in the tail absorbed when **matching to fixed order** is performed

Results



Results



**Beware of different
PDFs and central scales**