Predictions for Jet Vetoes in Higgs and Z-boson production

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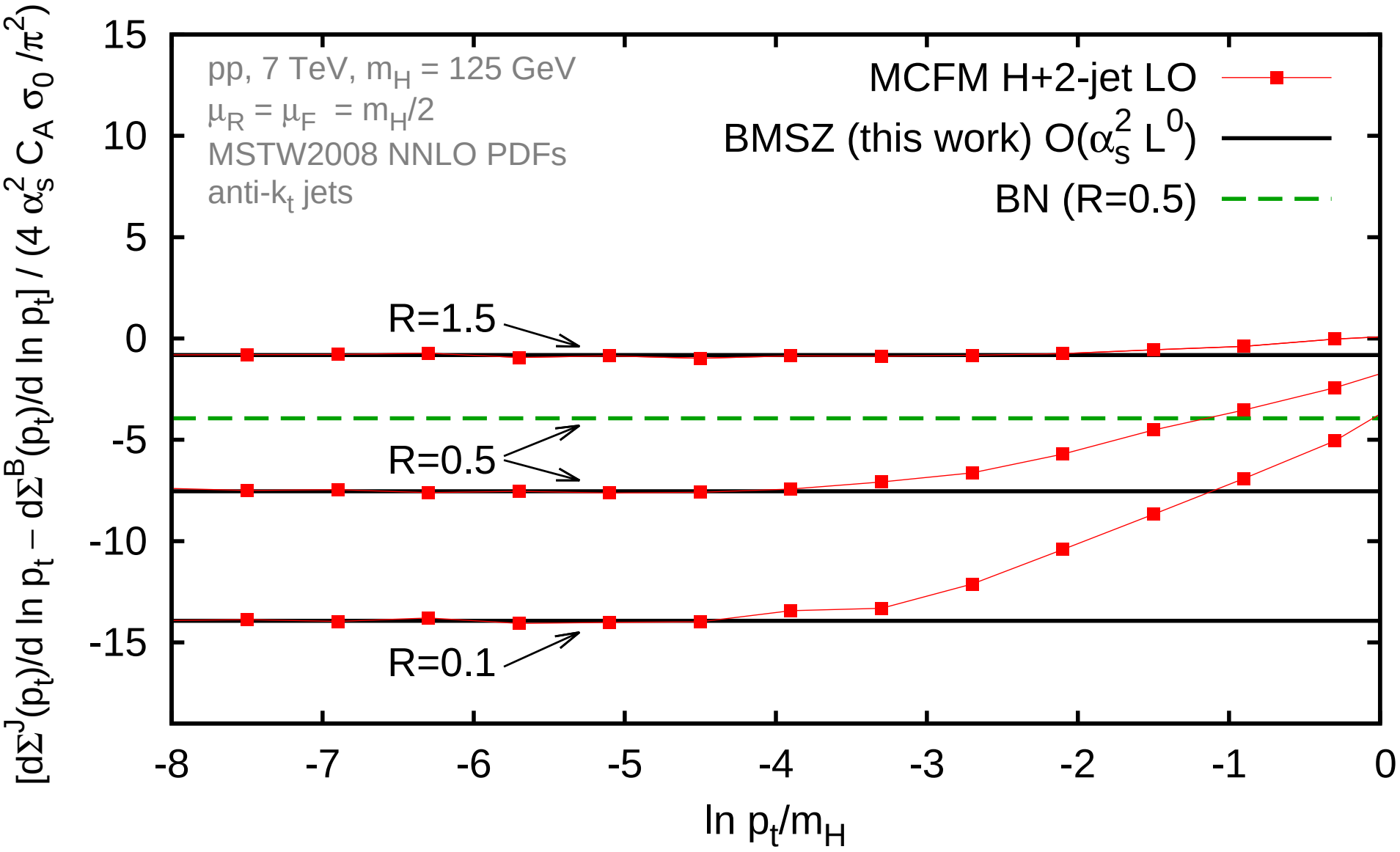
arXiv:1203.5773 (JHEP) & arXiv:1206.4998 (PRL)

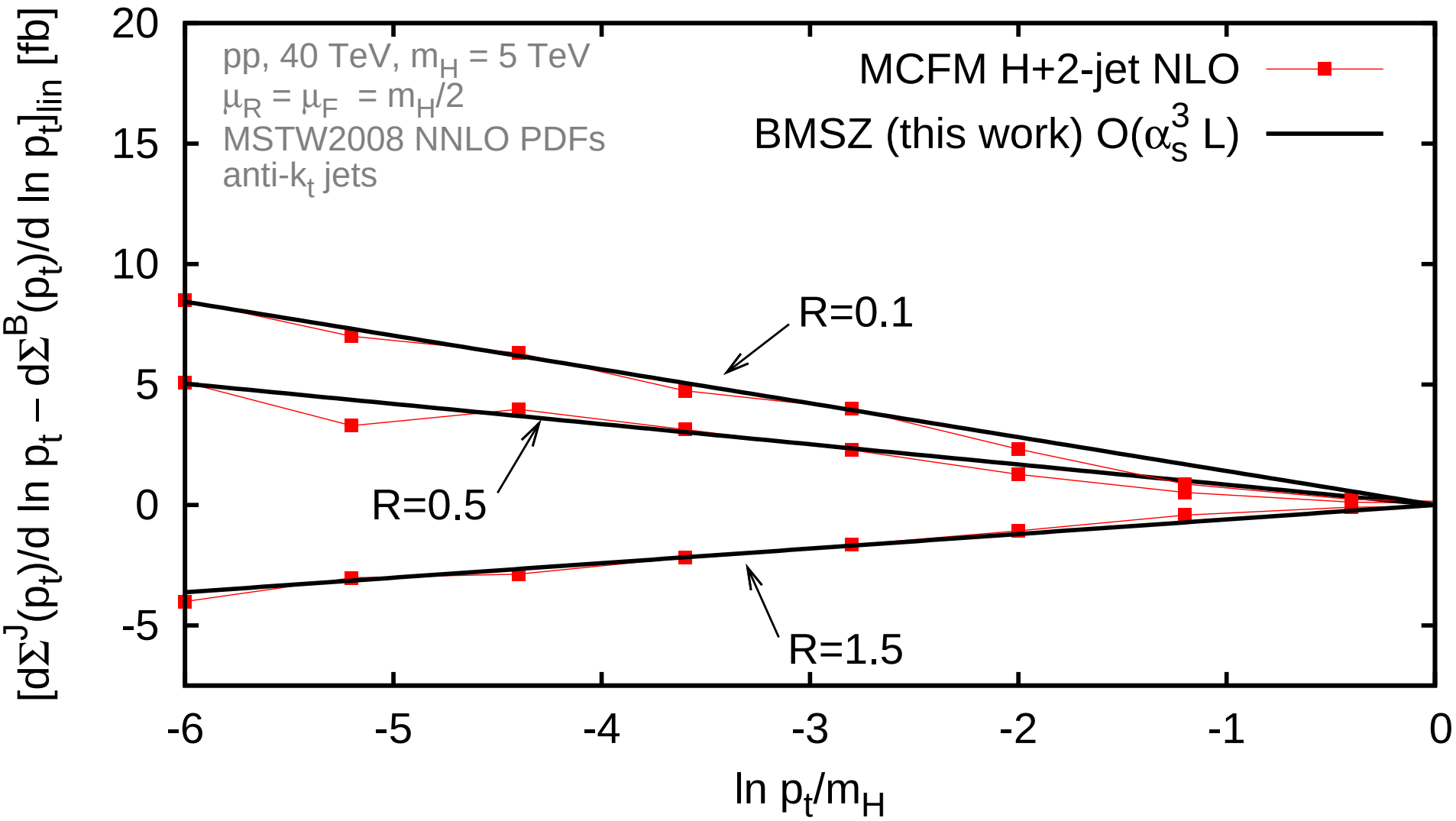
`http://jetvheto.hepforge.org/`

CERN Collider Cross Talk
25 October 2012

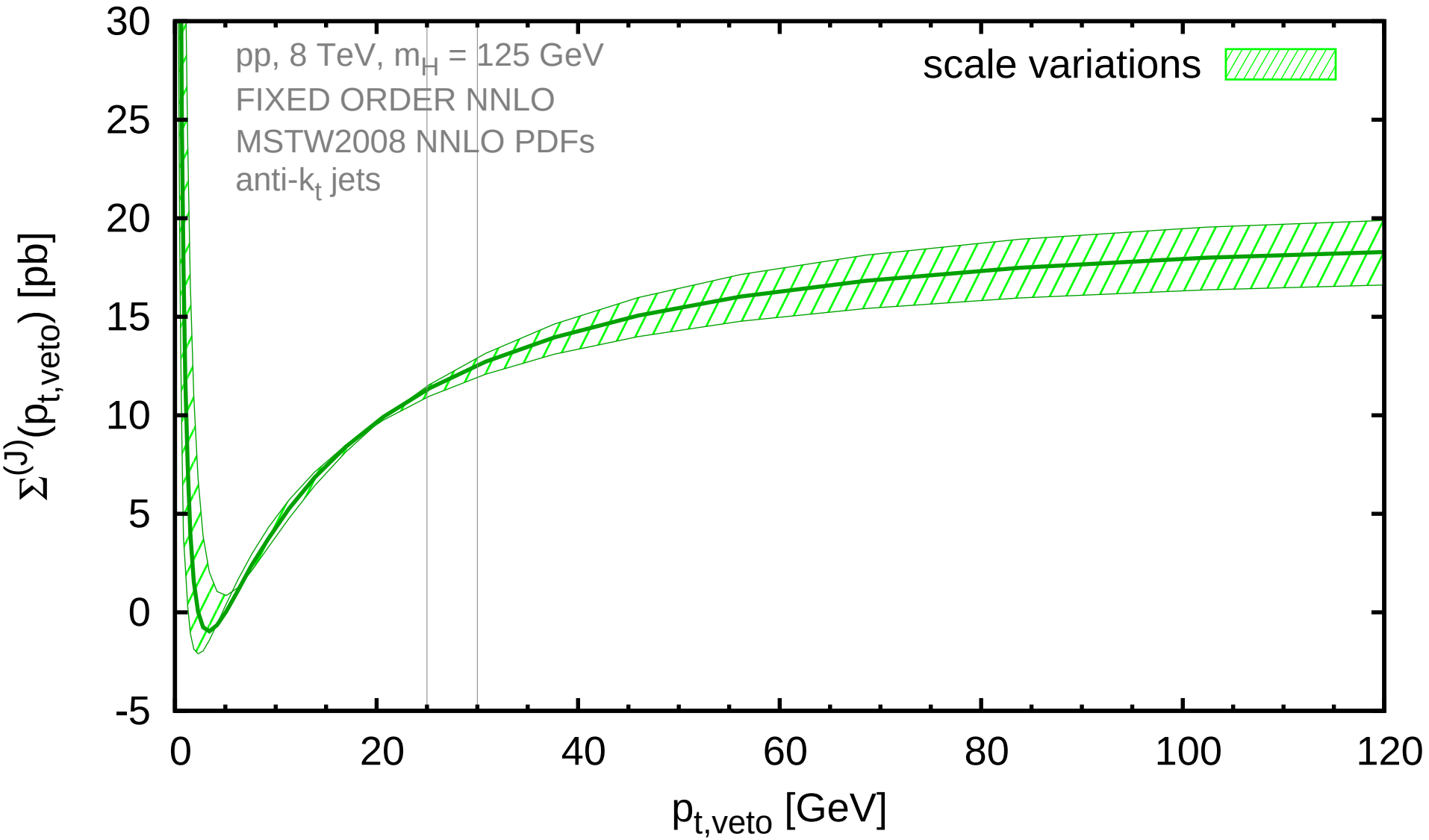
Checking logs at α_s^2



Checking logs at α_s^3

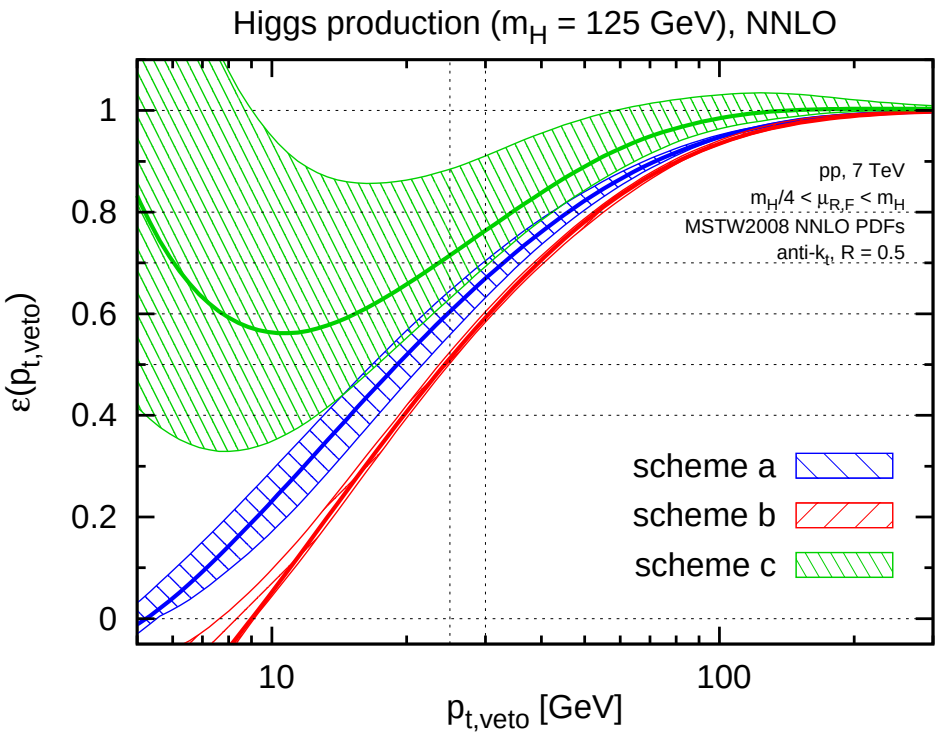


Uncertainties in cross section at NNLO

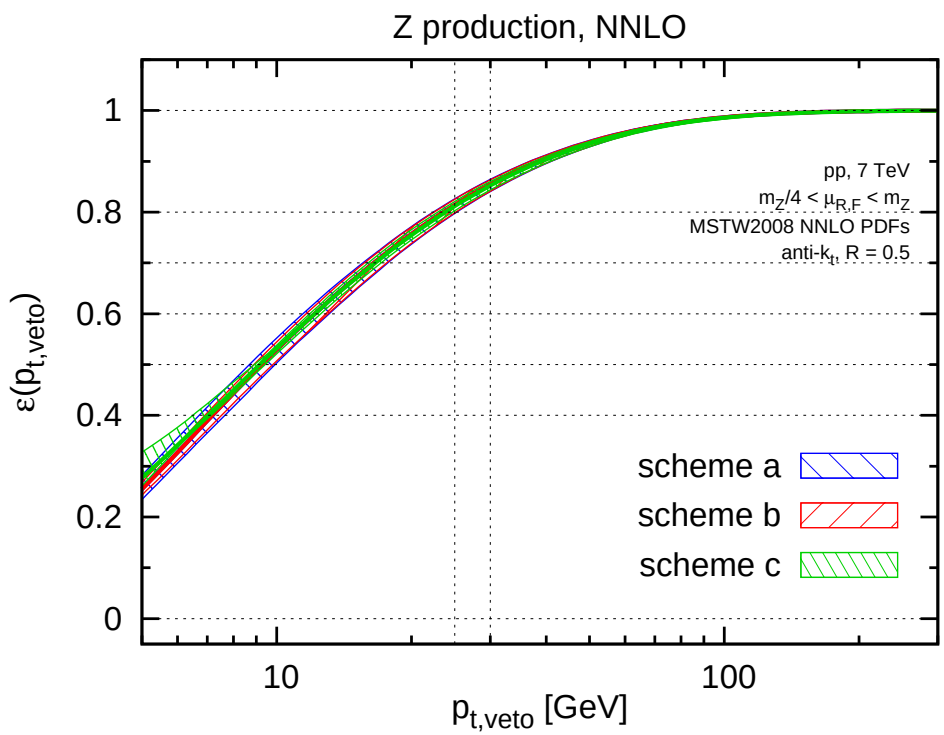


3 NNLO schemes for efficiency + their scale uncertainty

Higgs

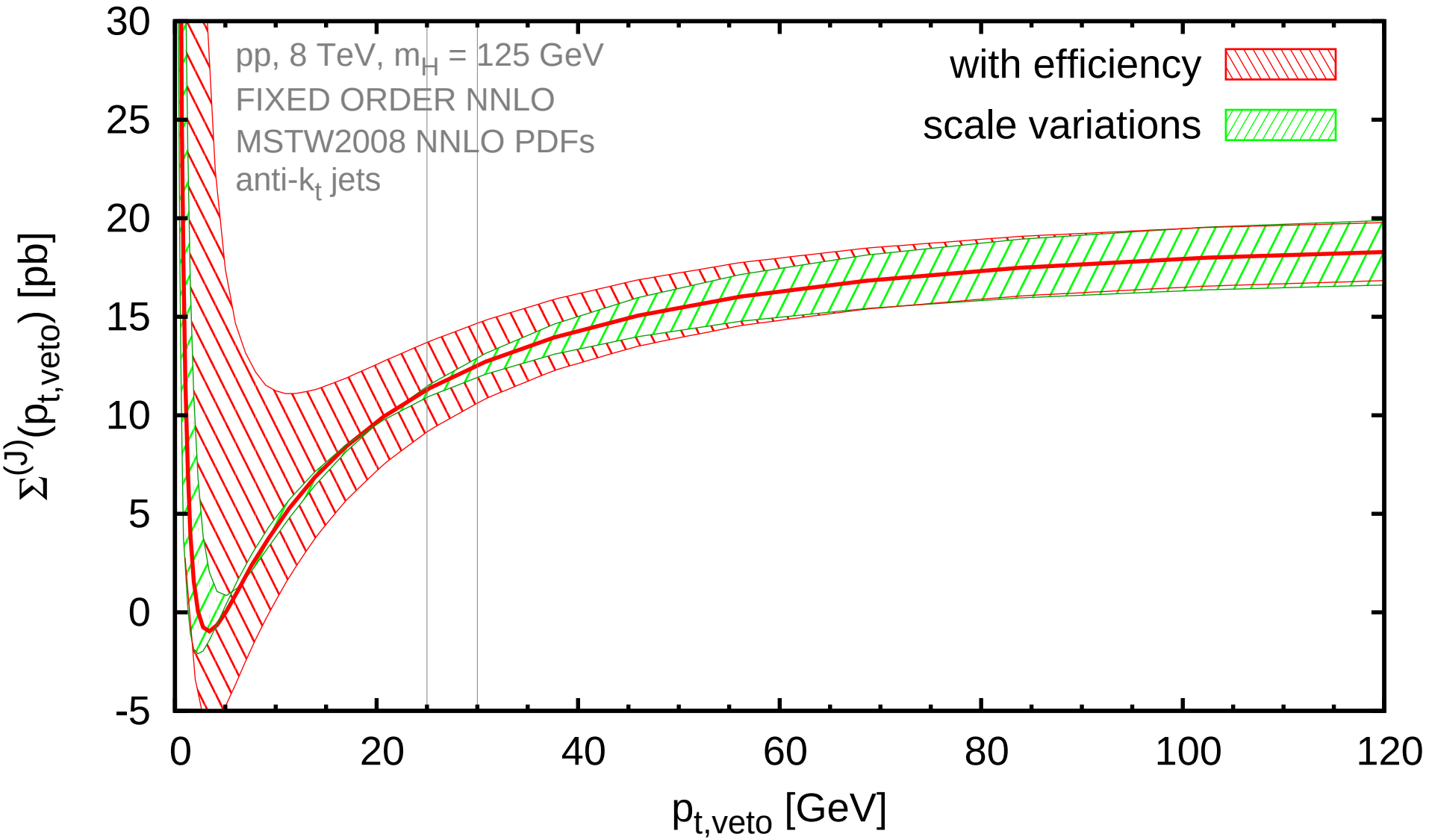


Z production

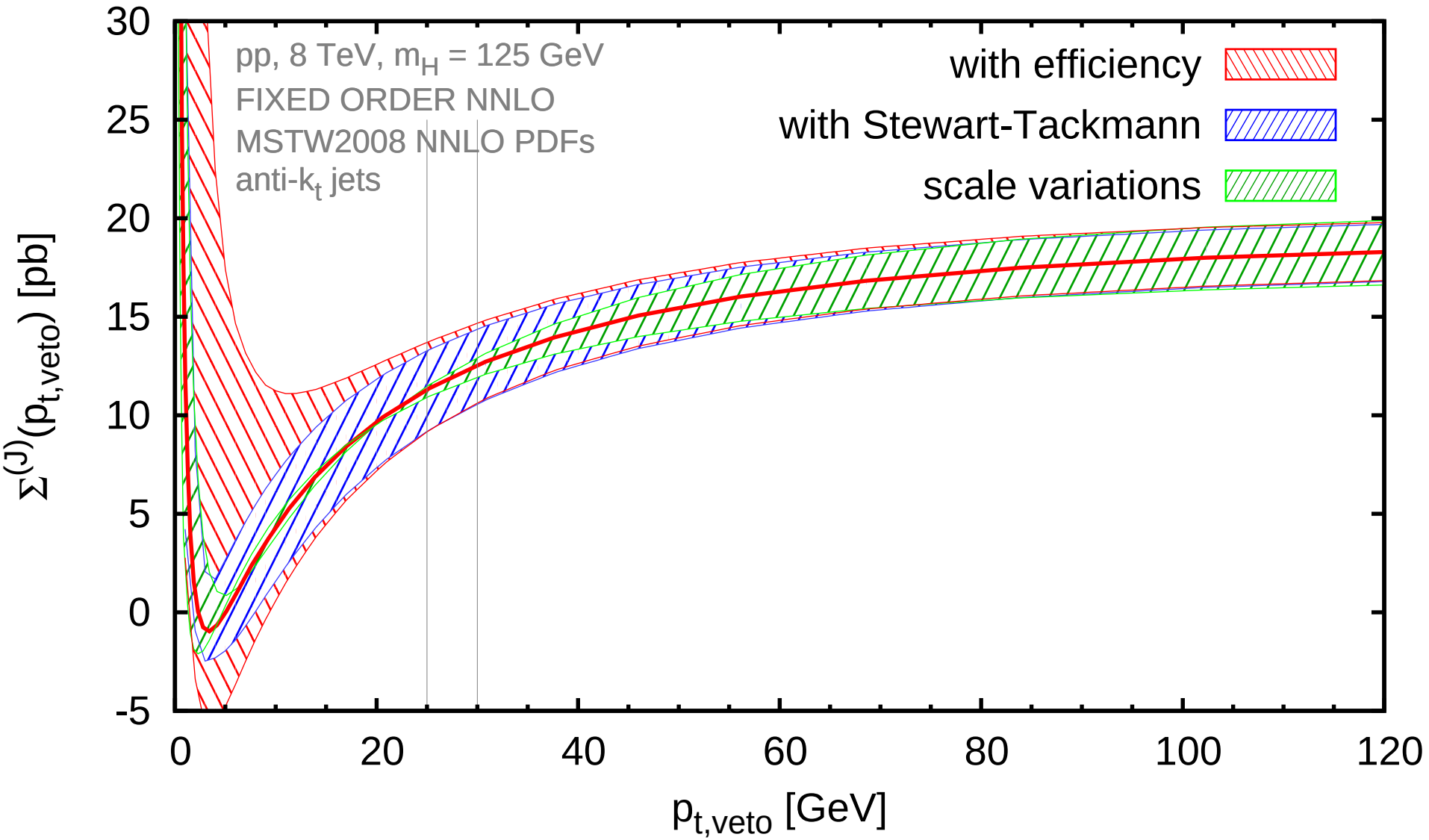


Our efficiency band becomes envelope of: band *a* & central values of *b* and *c*

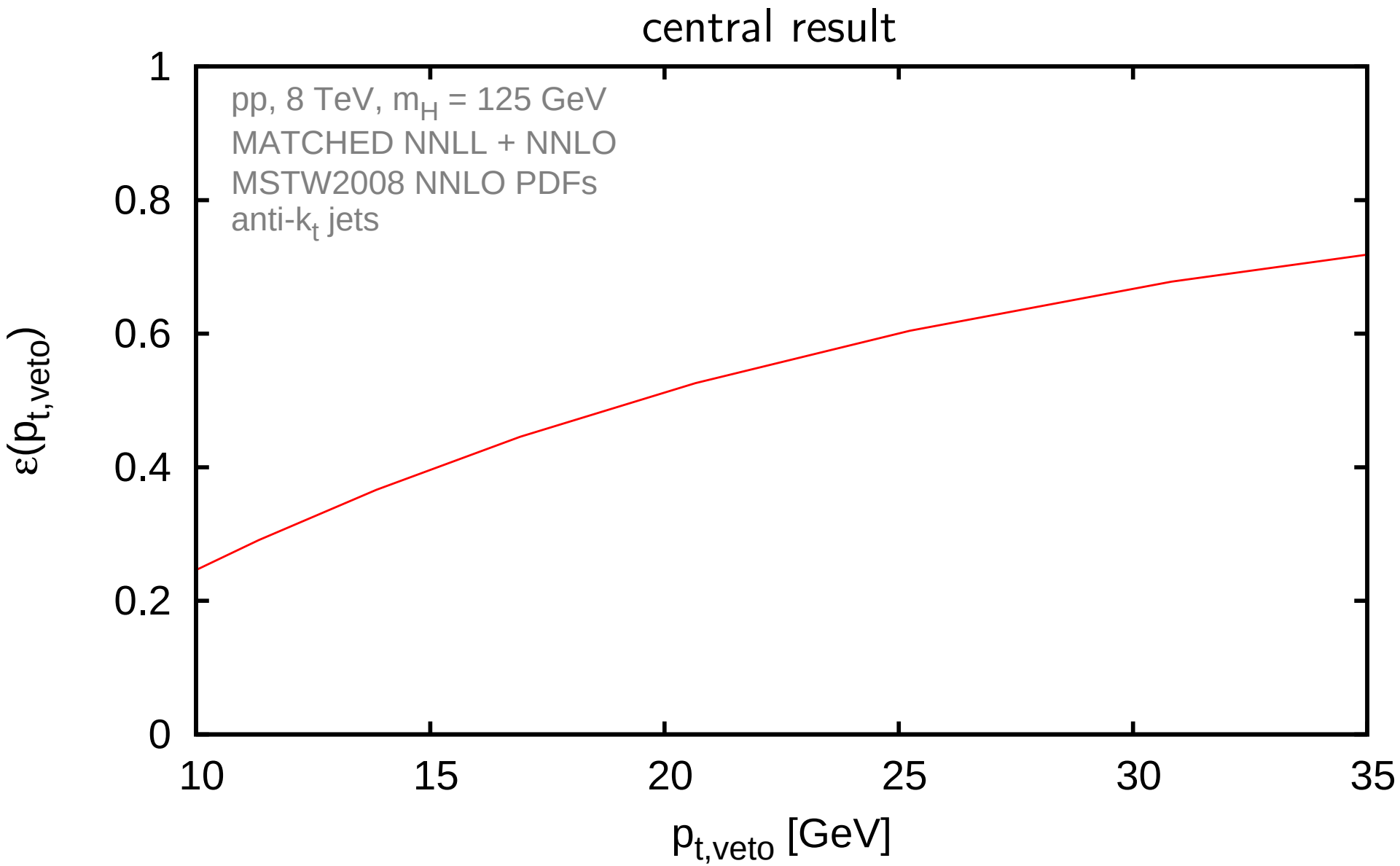
Uncertainties in cross section at NNLO



Uncertainties in cross section at NNLO



Different uncertainty contributions at NNLO + NNLL



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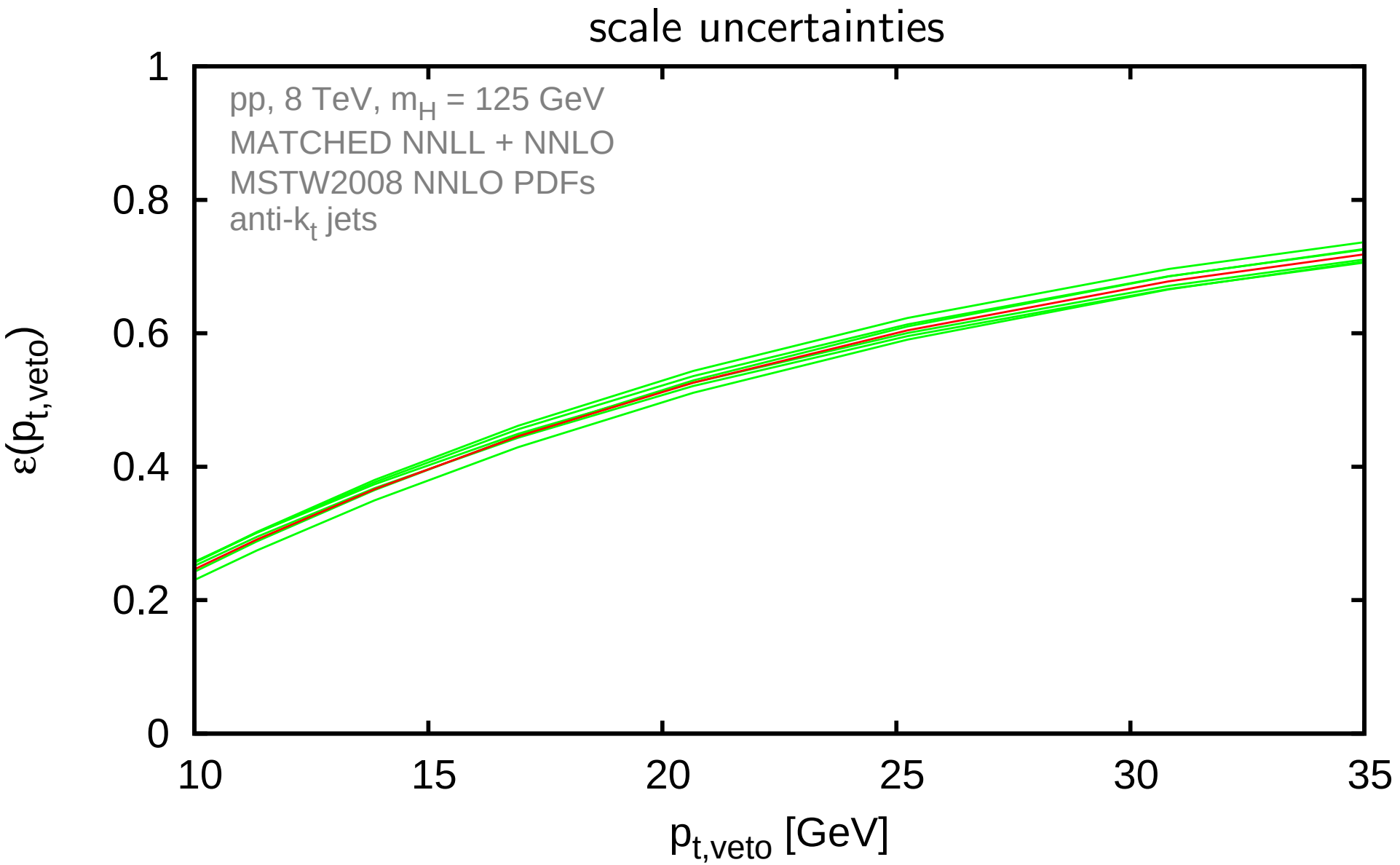

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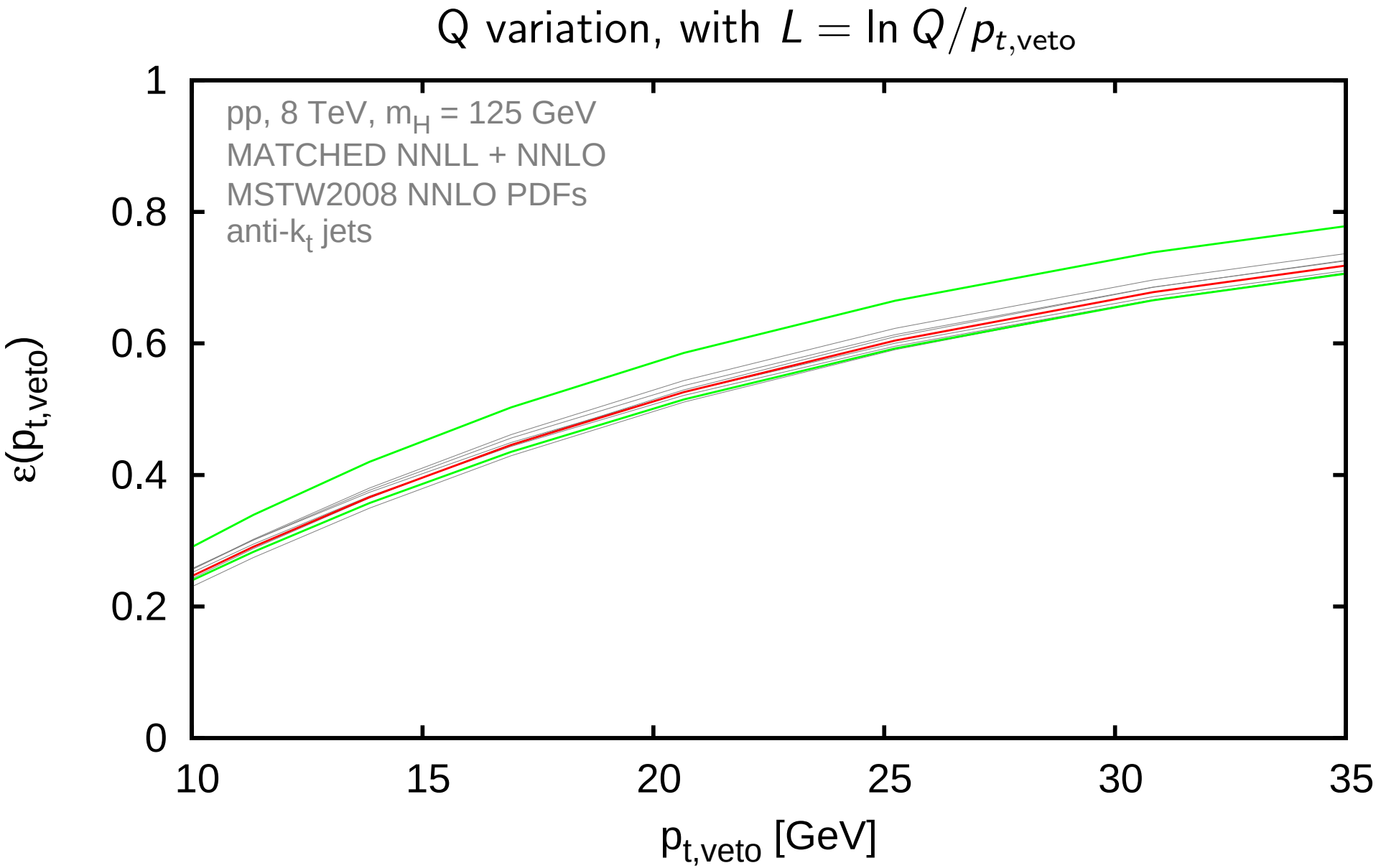

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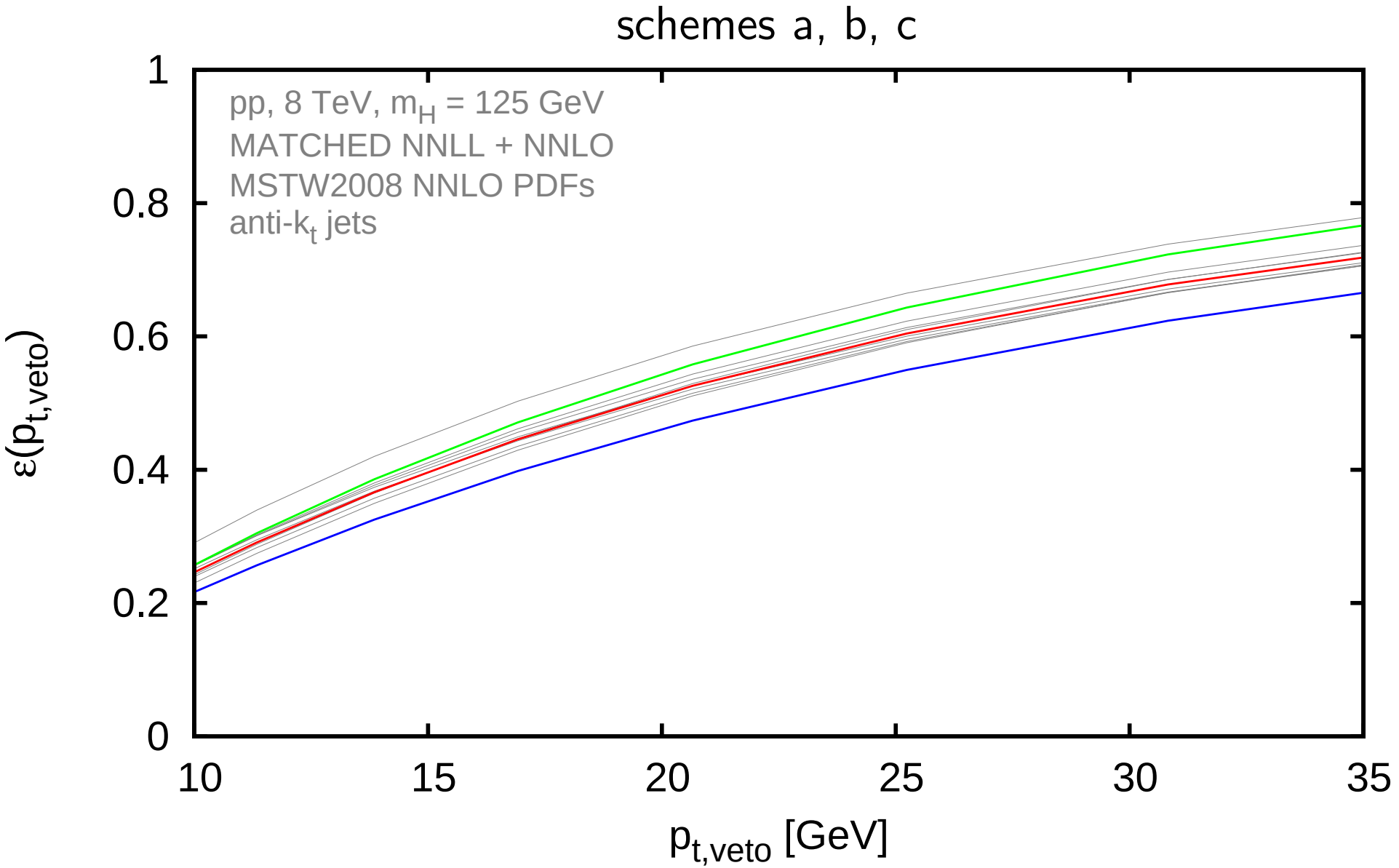
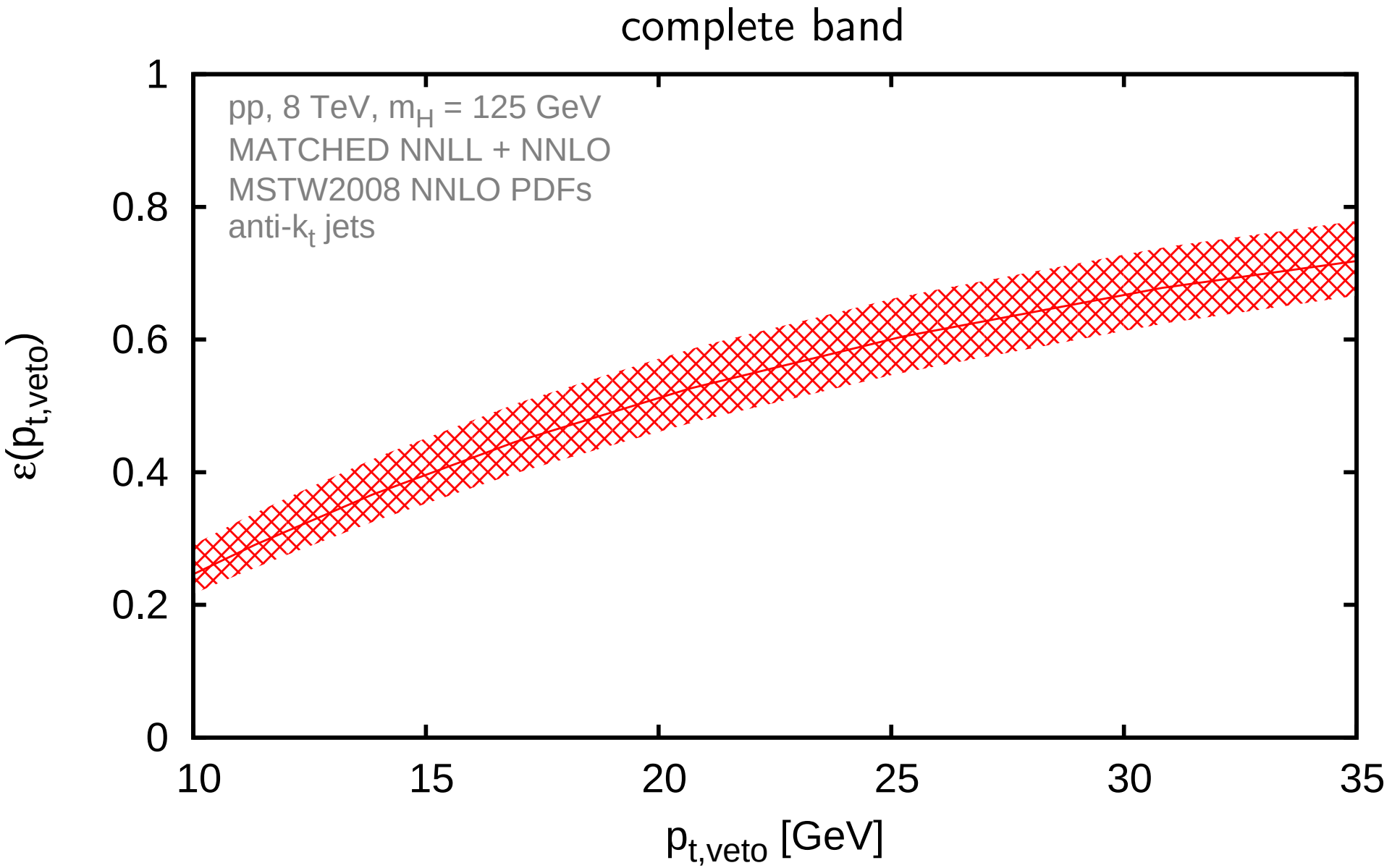
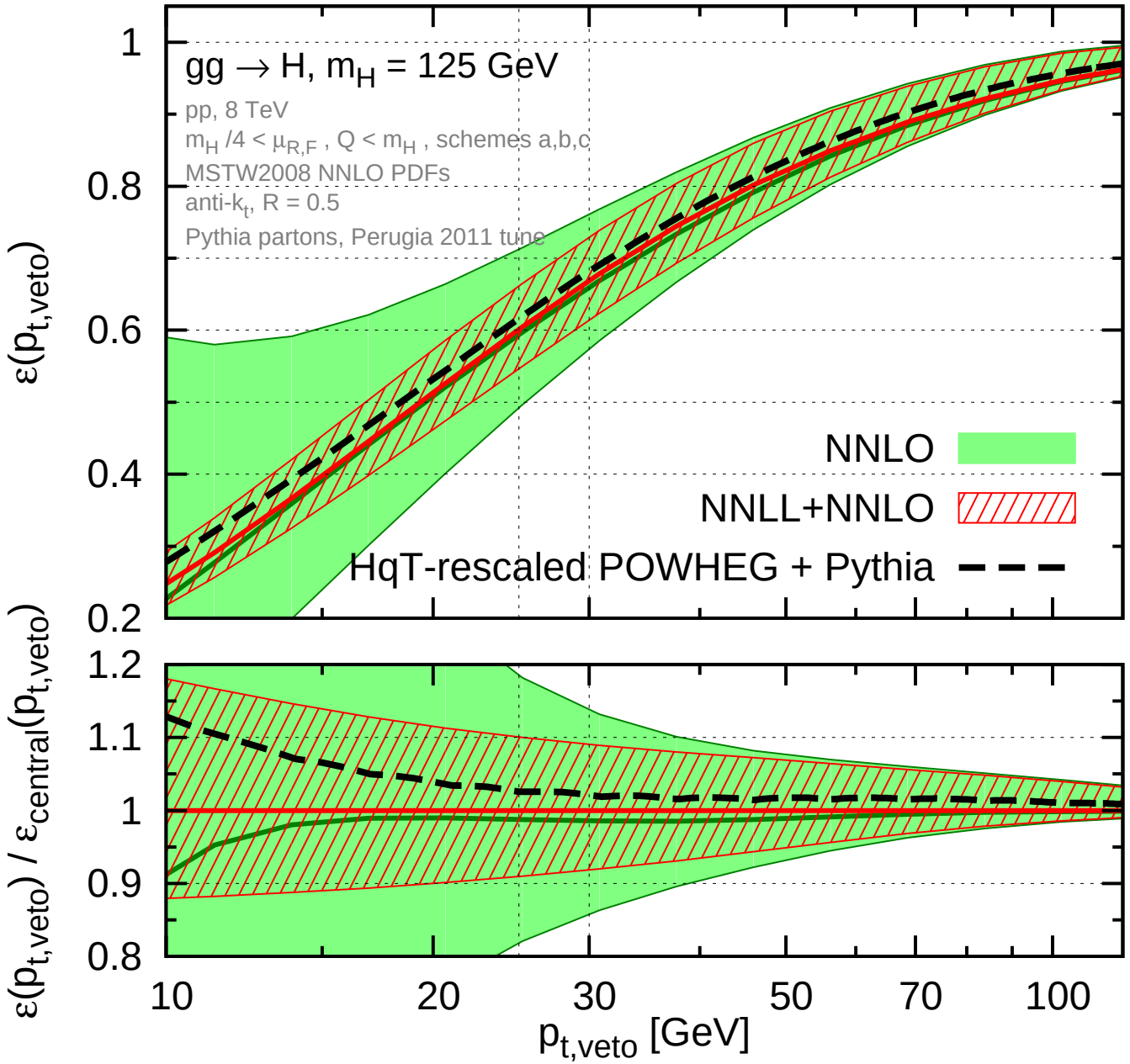
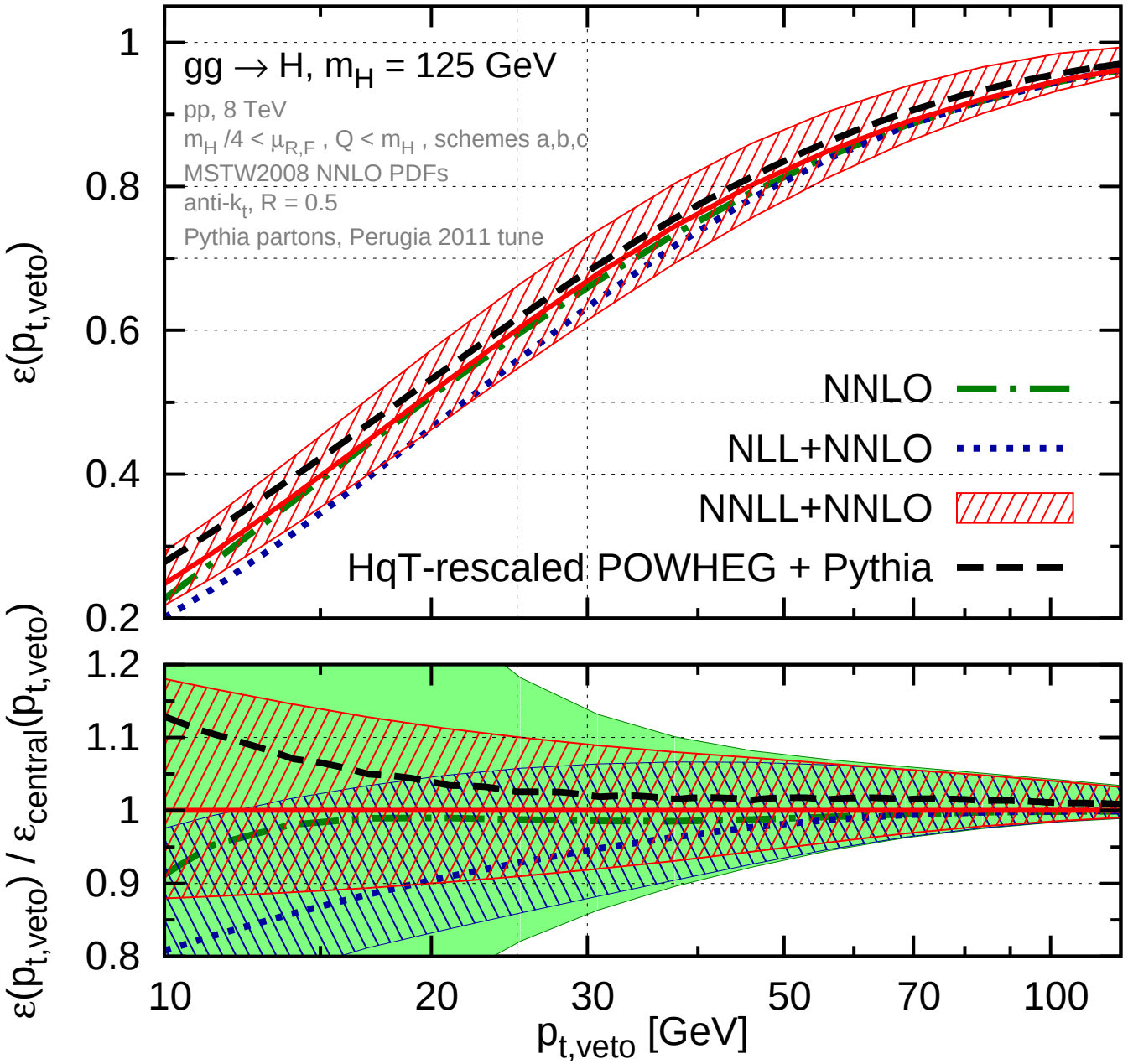


Different uncertainty contributions at NNLO + NNLL





NNLL+NNLO compared to NNLO and POWHEG+Pythia



adding in also
NLL+NNLO

Efficiencies and cross sections

R	$p_{t,\text{veto}}$	$\epsilon^{(7\text{ TeV})}$	$\sigma^{(7\text{ TeV})}_{0\text{-jet}}$	$\epsilon^{(8\text{ TeV})}$	$\sigma^{(8\text{ TeV})}_{0\text{-jet}}$
0.4	25	$0.63^{+0.07}_{-0.05}$	$9.6^{+1.3}_{-1.1}$	$0.61^{+0.07}_{-0.06}$	$12.0^{+1.6}_{-1.4}$
0.5	30	$0.68^{+0.06}_{-0.05}$	$10.4^{+1.2}_{-1.1}$	$0.67^{+0.06}_{-0.05}$	$13.0^{+1.5}_{-1.5}$
1.0	30	$0.64^{+0.03}_{-0.05}$	$9.8^{+0.8}_{-1.1}$	$0.63^{+0.04}_{-0.05}$	$12.2^{+1.1}_{-1.4}$

Correlation matrix between 0 and 1-jet (inclusive) cross section

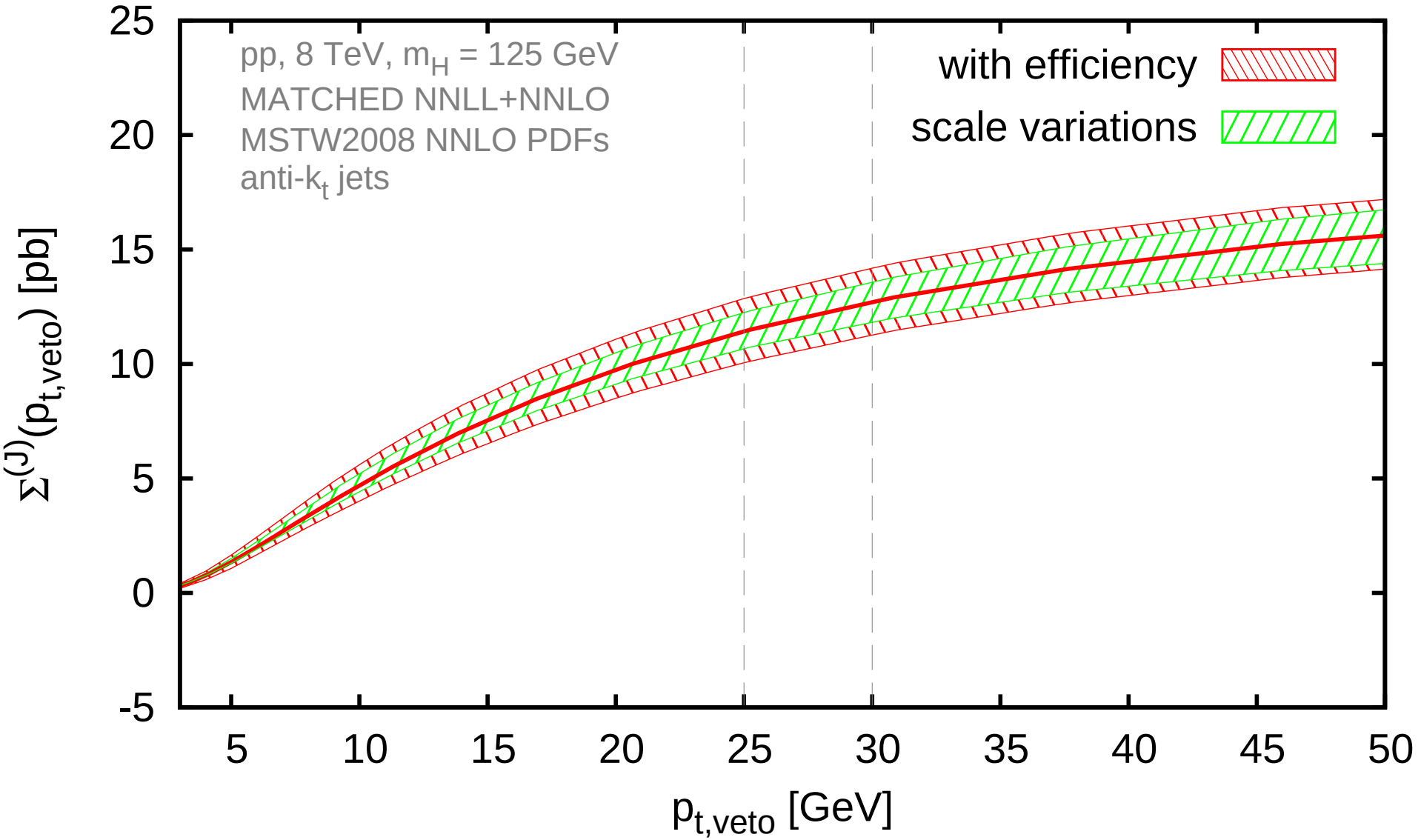
$$\begin{pmatrix} \epsilon^2\delta_\sigma^2 + \sigma^2\delta_\epsilon^2 & \epsilon(1-\epsilon)\delta_\sigma^2 - \sigma^2\delta_\epsilon^2 \\ \epsilon(1-\epsilon)\delta_\sigma^2 - \sigma^2\delta_\epsilon^2 & (1-\epsilon)^2\delta_\sigma^2 + \sigma^2\delta_\epsilon^2 \end{pmatrix}$$

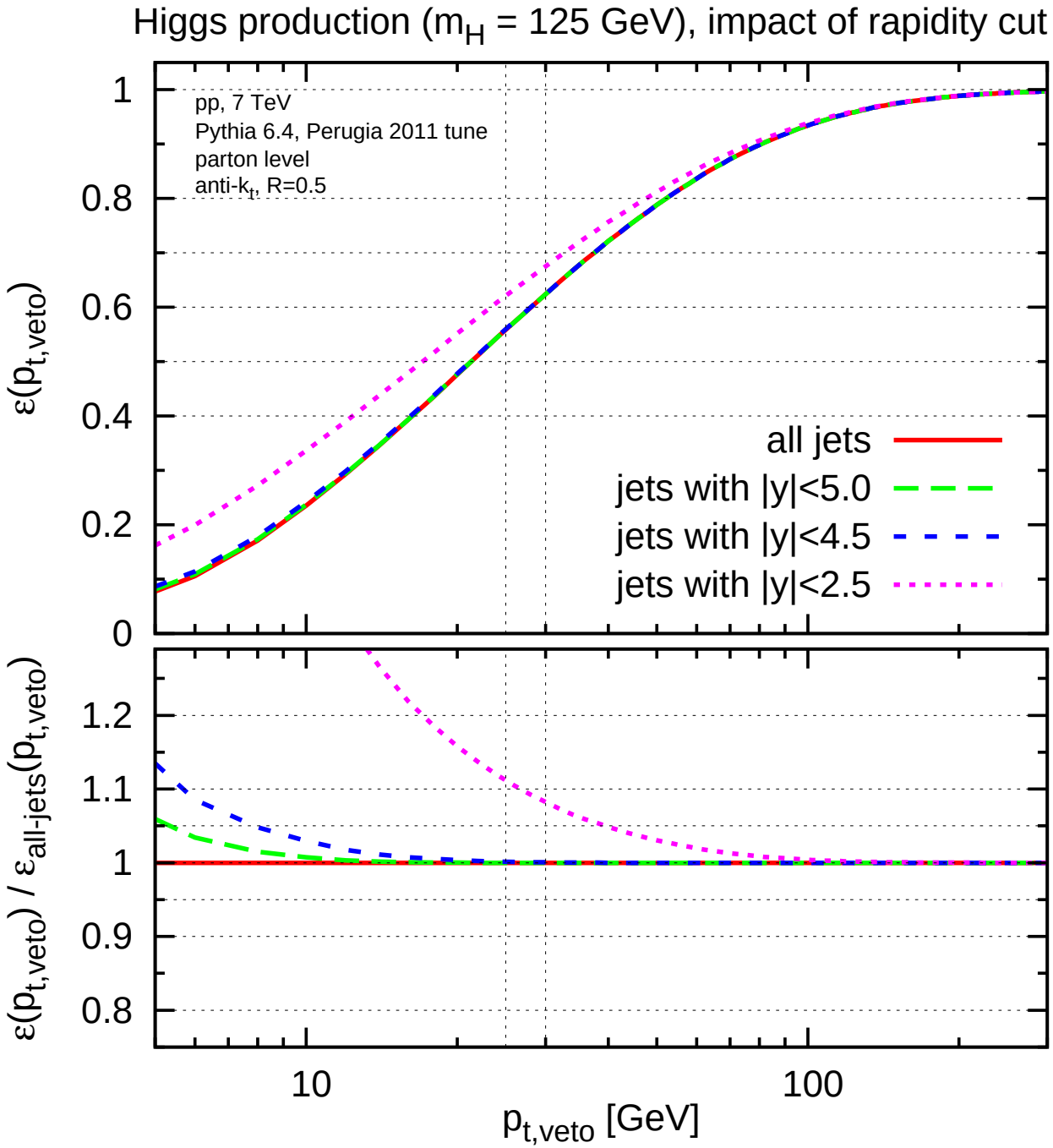
Program available from

`http://jetvheto.hepforge.org/`

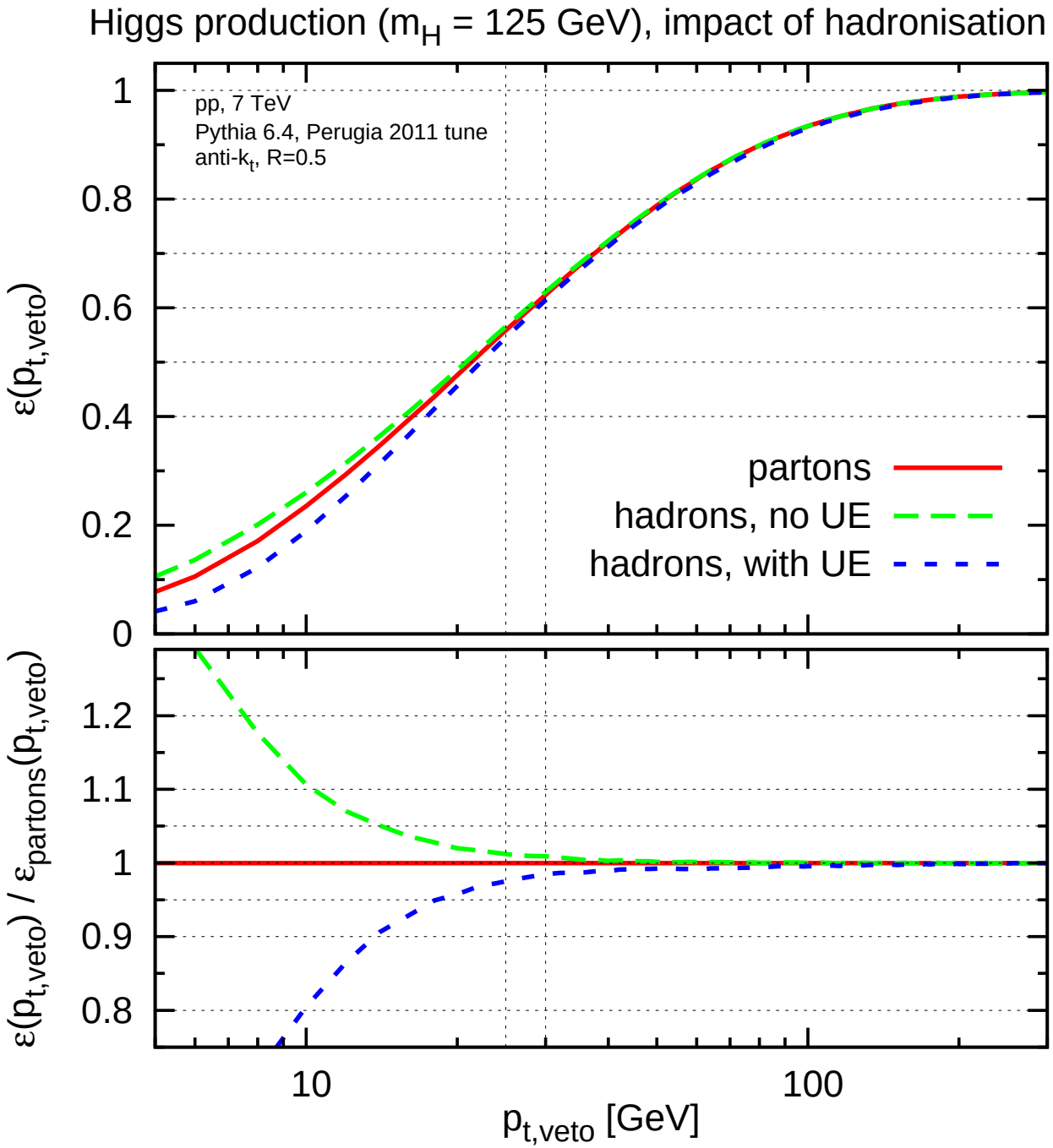
EXTRAS

Vetoed $\Sigma(p_t)$: full uncertainties v. direct scale variation





Impact of finite rapidity acceptance for jets



Impact of hadronisation and underlying event