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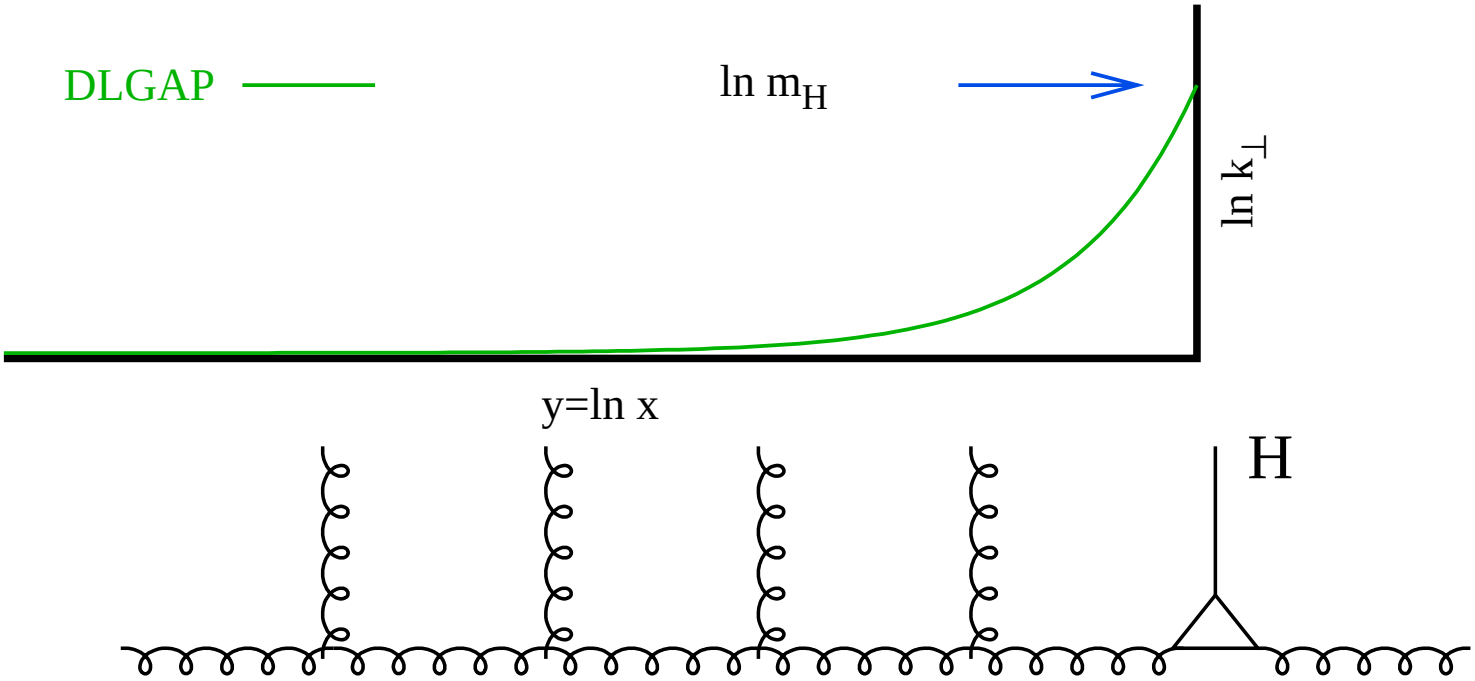
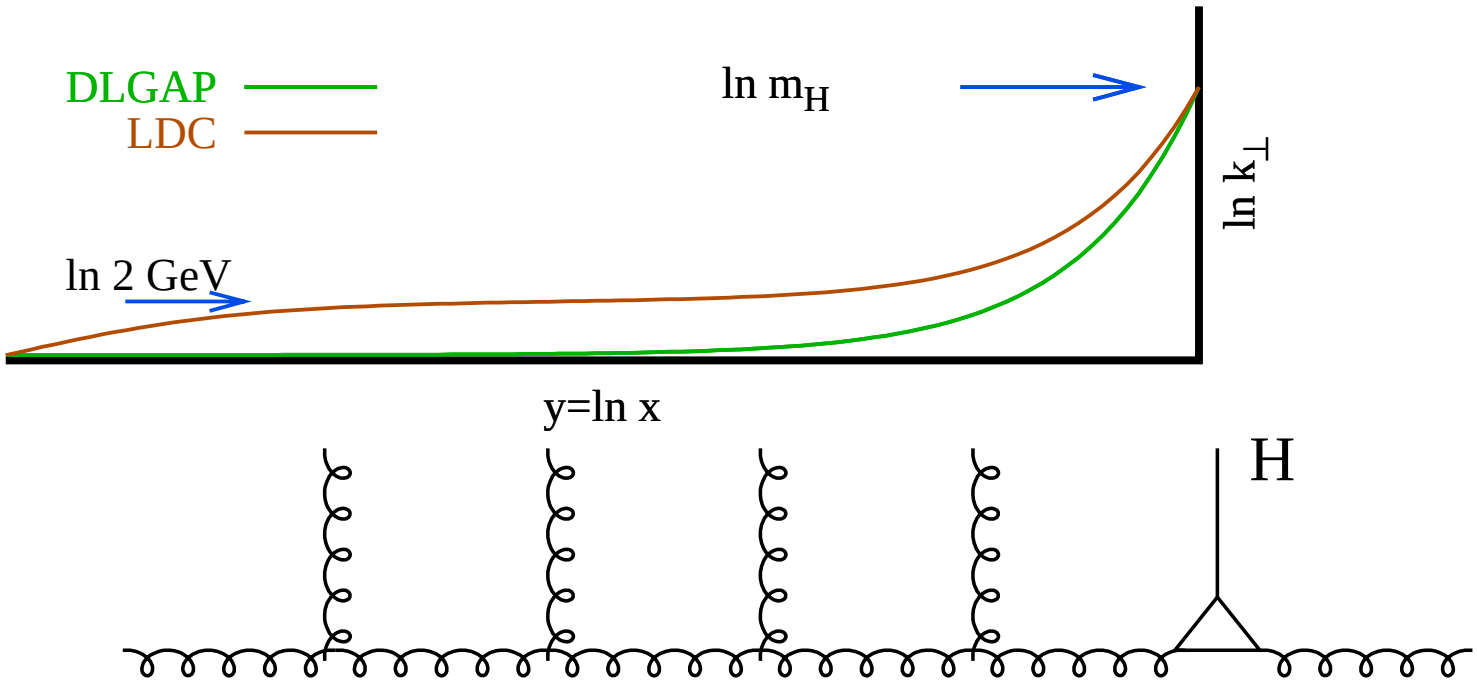
DGLAP?



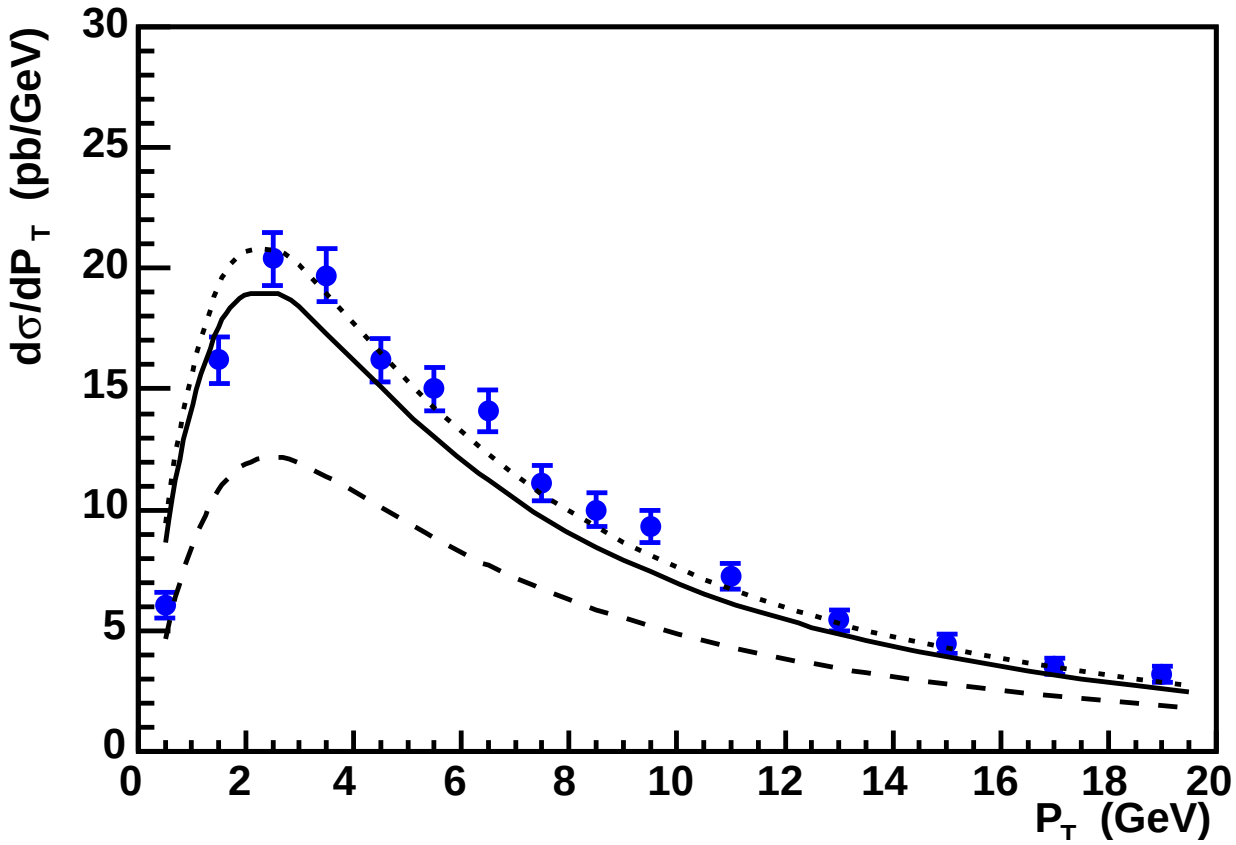
The integrated PDF is well constrained.

How well do we know the uPDF at small transverse momenta.

What is the typical evolution path?
DGLAP? Or BFLK/CCFM/LDC?



$p_\perp$-distribution of Z^0 at the Tevatron vs. KMR uPDF
(from Martin, Ryskin, Watt)



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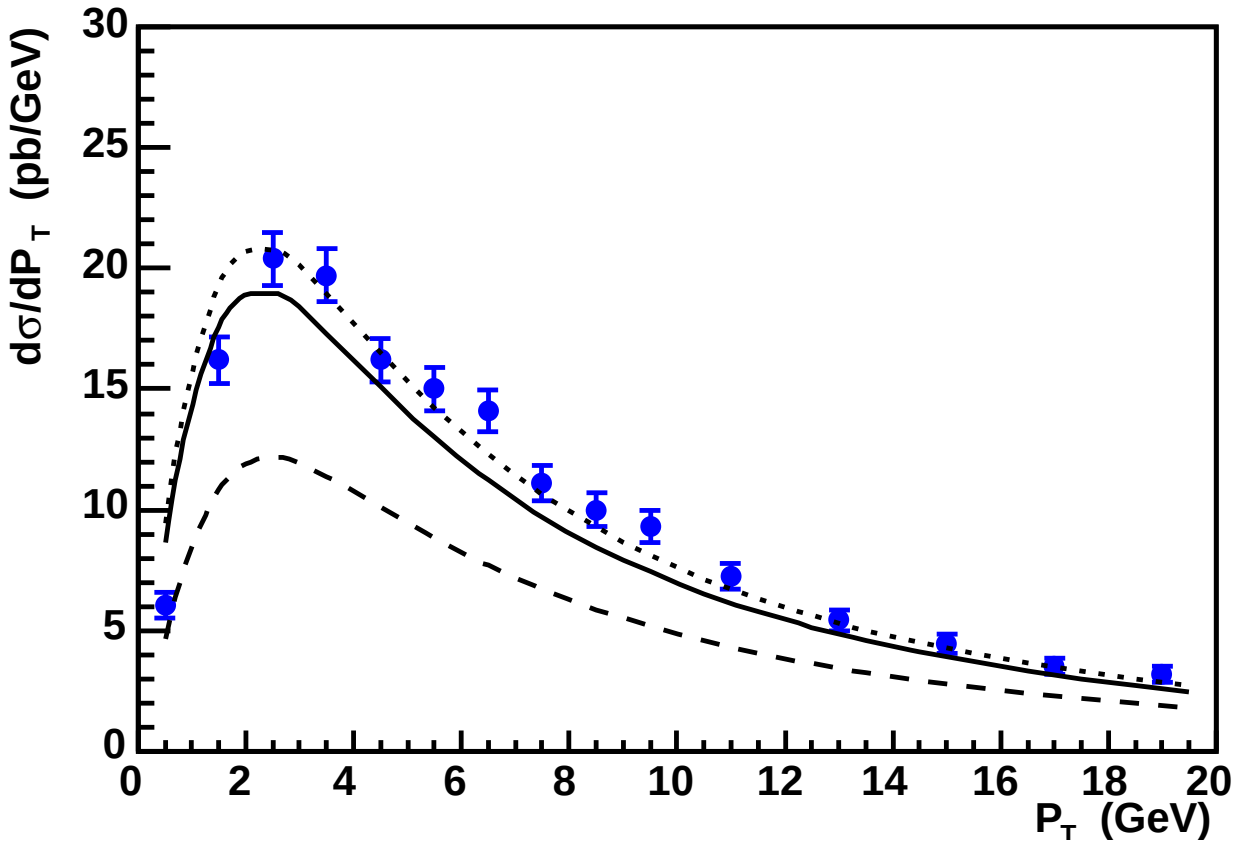
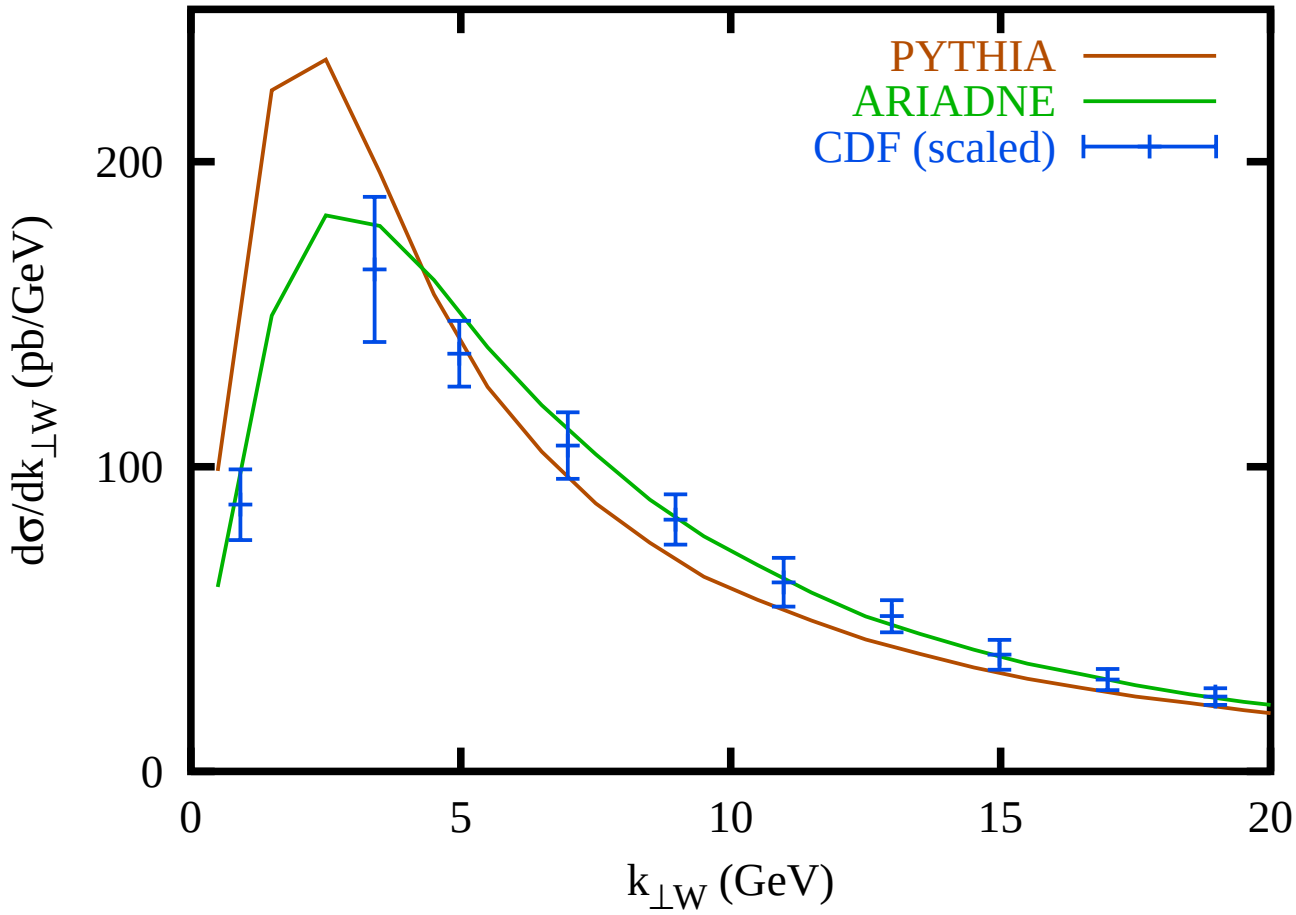
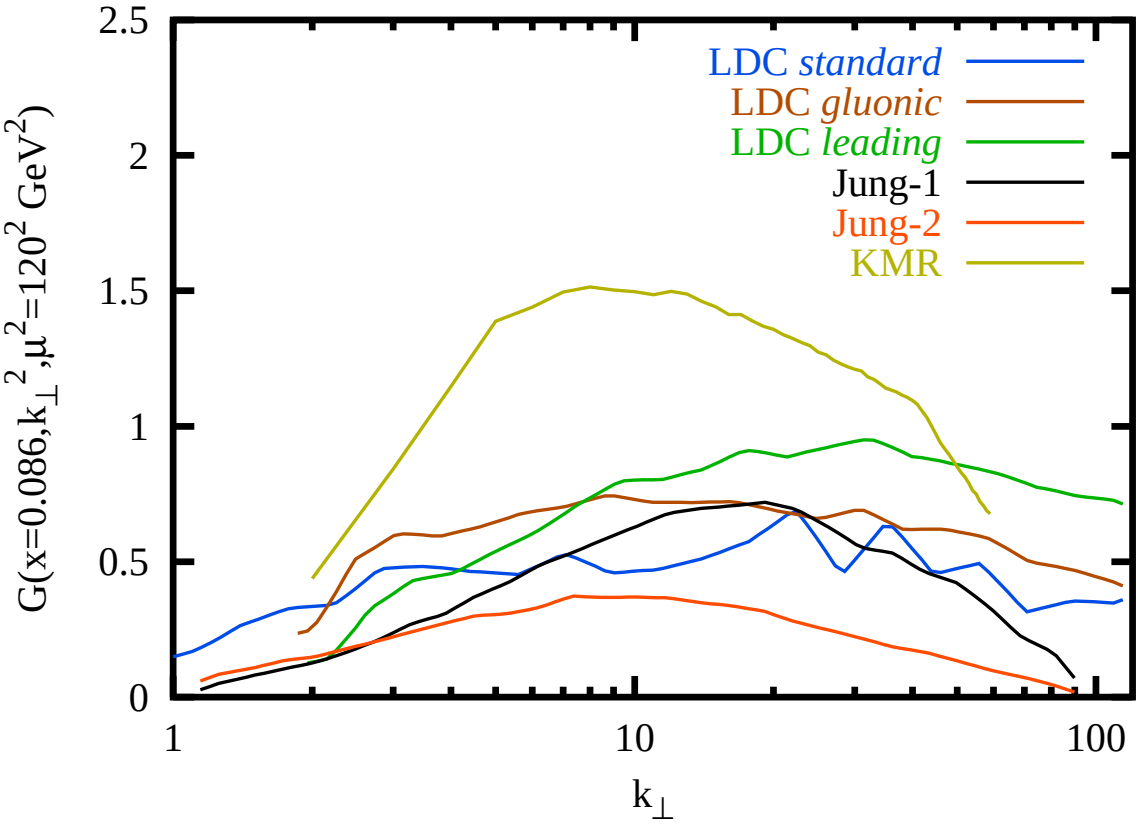
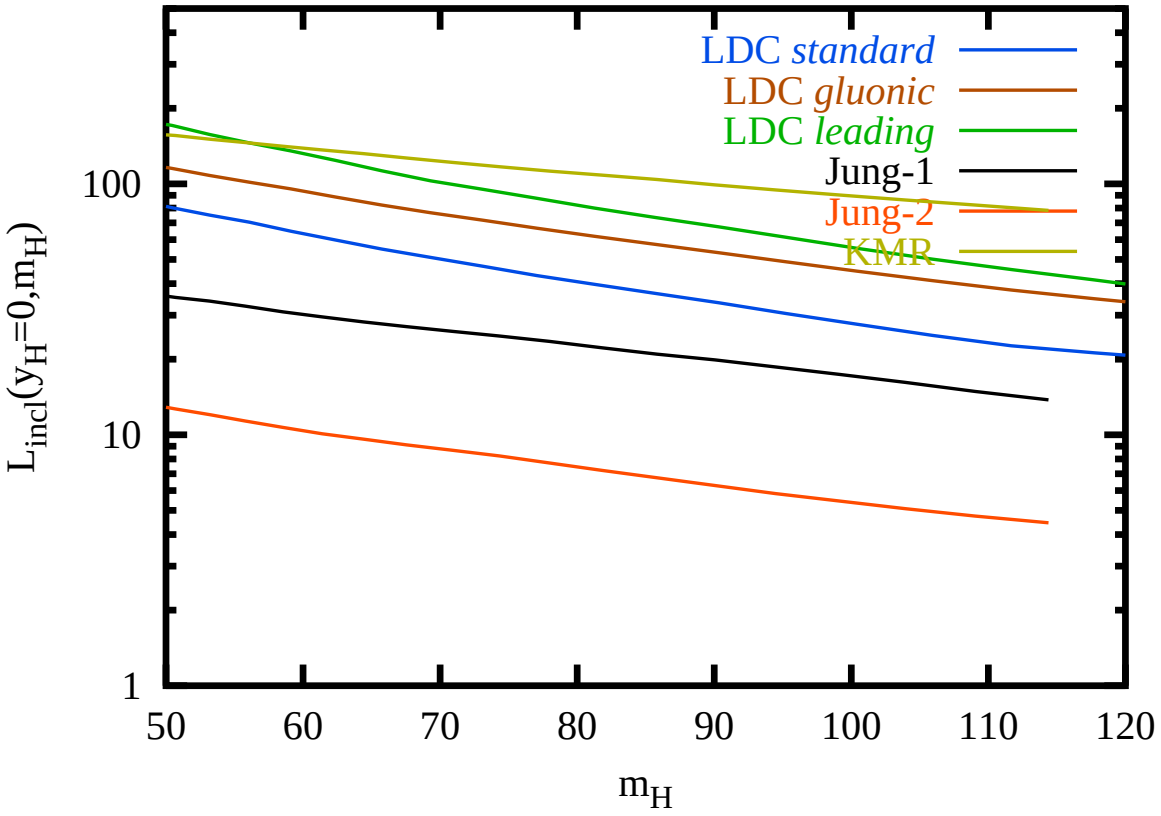


Consistent with findings of standard DGLAP Parton Showers which need an intrinsic $k_\perp$ of $1-2$ GeV. (For quarks.)


PYTHIA
ARIADNE
CDF (scaled)
200
100
0
0
5
10
15
20
dσ/dk⊥W (pb/GeV)
k⊥W (GeV)

For $\mu^2 = m_H^2$ and $x = m_H/W_{LHC}$ there are large differences in shape and normalization for different uPDFs



Also large differences in the inclusive luminosity function (LHC).

$$\frac{d\sigma_H^{\text{incl}}}{dM^2dy} = \frac{d\mathcal{L}_{\text{incl}}}{dM^2dy}\hat{\sigma}_{gg\to H}(M^2)\ ,\ M^2\frac{d\mathcal{L}_{\text{incl}}}{dM^2dy} = L_{\text{incl}} = xg(m_H/W, m_H^2)^2$$