

Updates from ABKM

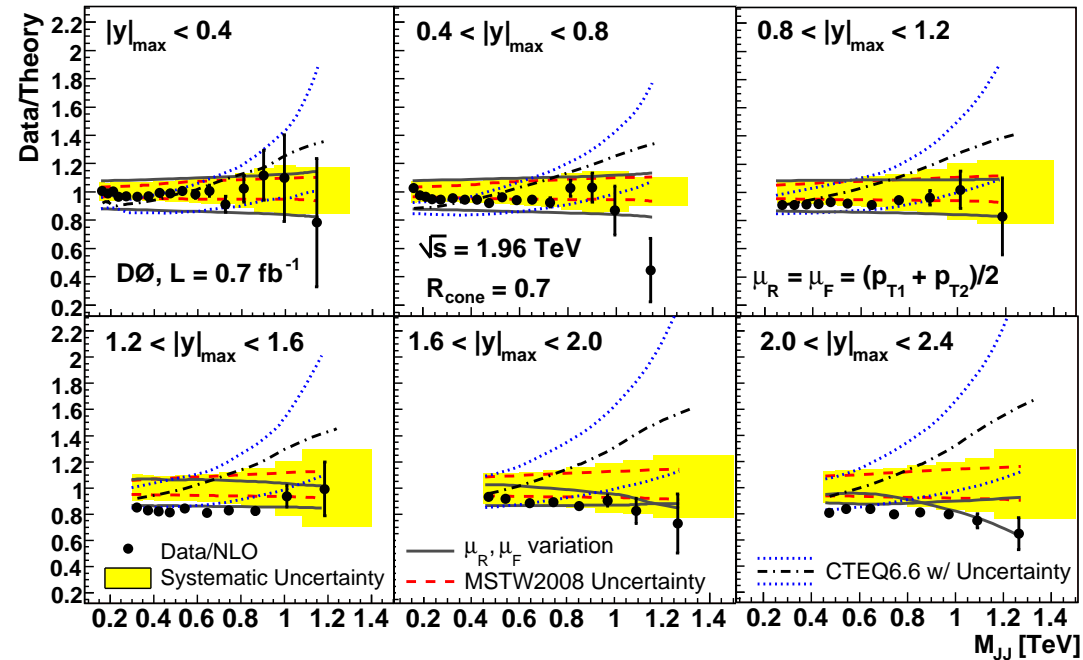
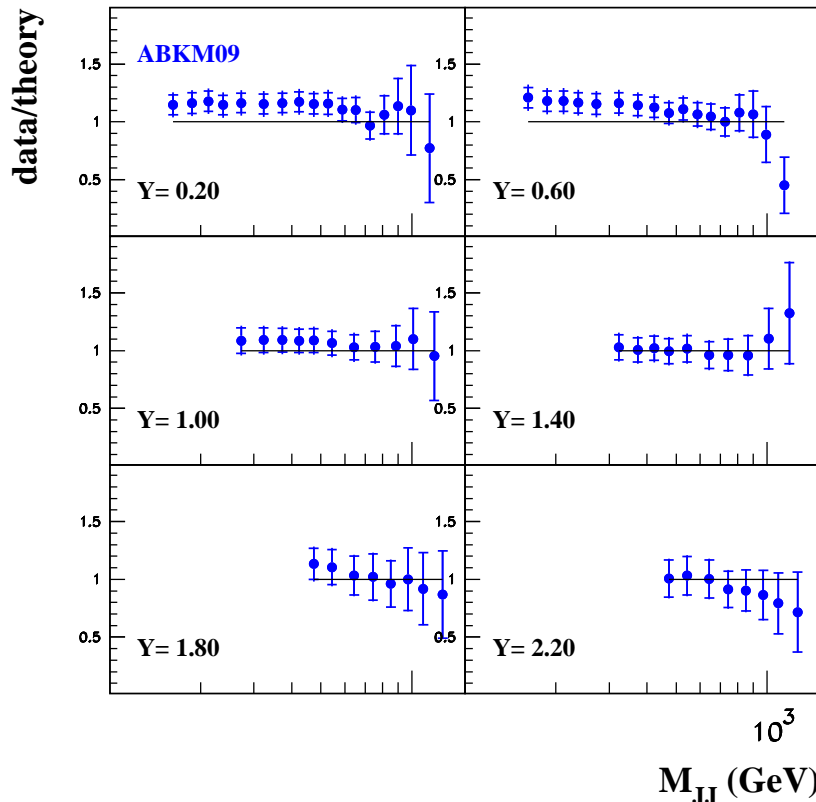
S. Alekhin, J. Blümlein, S. Moch

DESY, Zeuthen

– Higgs XS WG meeting, May 04-06, 2011, BNL –

Impact of Tevatron jet data

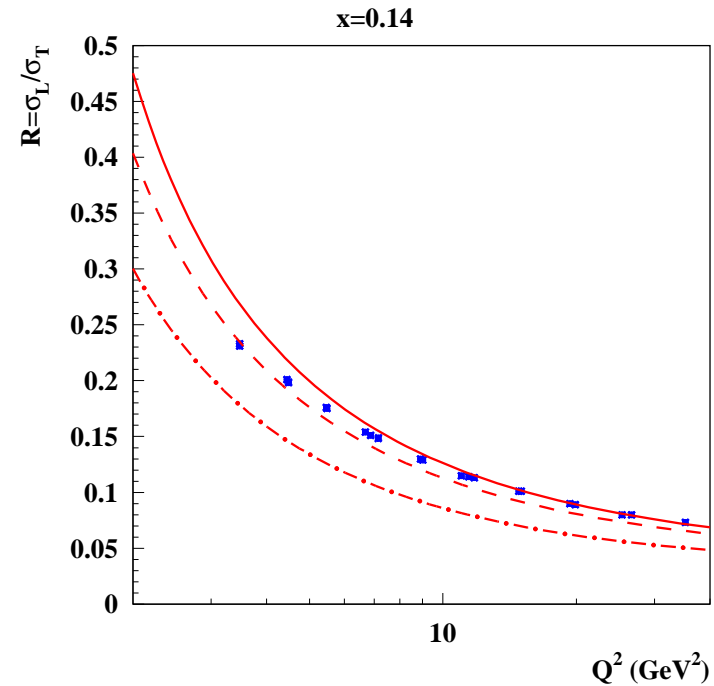
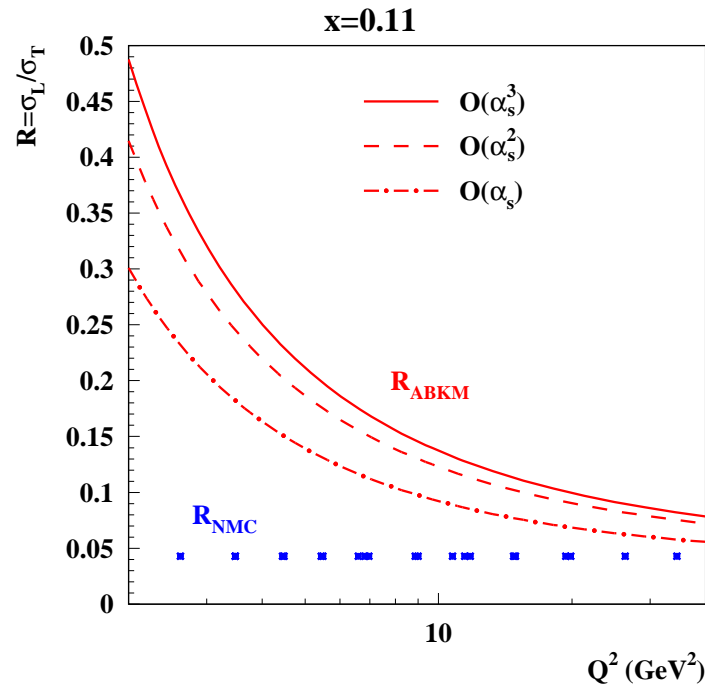
D0(2jet) - NLO(evol) + NLO(coeff)



- NLO ABKM09 predictions compared to D0 Run II dijet data (D0 coll. '10)
 - 5-flavor PDFs generated from the 3-flavor ones $\mu_r = \mu_f = M_{JJ}$
Alekhin, Blümlein, Moch arXiv:1007.3657

- Impact of the data on ABKM PDFs is generally small
- ABKM provides very good description of Run II jet data

NMC in a nut-shell



- Cross section depends on DIS structure functions F_2 and F_L
(or alternatively $R = \sigma_T / \sigma_L$)

Alekhin, Blümlein, Moch [arXiv:1101.5261](https://arxiv.org/abs/1101.5261)

$$\frac{d^2 \sigma(x, Q^2)}{dx dQ^2} = \frac{4\pi\alpha^2}{xQ^4} \times \left\{ 1 - y - xy \frac{M^2}{s} + \left(1 - \frac{2m_l^2}{Q^2} \right) \left(1 + 4x^2 \frac{M^2}{Q^2} \right) \frac{y^2}{2(1 + R(x, Q^2))} \right\} F_2(x, Q^2)$$

Impact on Higgs production rates

- Rates for Higgs production at Tevatron

Alekhin, Blümlein, Moch [arXiv:1101.5261](https://arxiv.org/abs/1101.5261)

$\sigma(H)$	$\sigma(H)$ with σ_{NMC}	$\sigma(H)$ with F_2^{NMC}	difference
NLO	0.206(17) pb	0.225(18) pb	0.019 pb $\simeq 1.1\sigma$
NNLO	0.253(22) pb	0.309(24) pb	0.056 pb $\simeq 2.3\sigma$
NNLO + $\mathcal{O}(\alpha_s^3) F_L$	0.242(22) pb	0.310(24) pb	0.068 pb $\simeq 2.8\sigma$

- Rates for Higgs production at LHC with $\sqrt{s} = 7 \text{ TeV}$

$\sigma(H)$	$\sigma(H)$ with σ_{NMC}	$\sigma(H)$ with F_2^{NMC}	difference
NLO	5.73(17) pb	5.95(18) pb	0.18 pb $\simeq 1.0\sigma$
NNLO	7.05(23) pb	7.70(23) pb	0.65 pb $\simeq 2.7\sigma$
NNLO + $\mathcal{O}(\alpha_s^3) F_L$	6.84(21) pb	7.68(23) pb	0.84 pb $\simeq 3.7\sigma$

- Inconsistent variant accounts for most of difference between cross sections predictions of ABKM and MSTW