Ideas on new analysis of LHCb open charm data

Hamed Abdolmaleki

On behalf of xFitter developer team

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1. Motivation

Motivation

Motivation:

- Charm distribution selection
  - Perturbative charm
  - Non-Perturbative charm
  - Fitted charm
- Renormalization/ Factorization sensitivity
  - The factorization scale introduced to separate the energy scale of the partonic differential cross section and D meson fragmentation function. while
  - Fragmentation function is logarithmic dependent on the renormalization scale which is associated with the divergences, especially at low Z.

$$D^{\mathrm{NLO}}_{Q\to H}(z,\mu_F) = D^{\mathrm{LO}}_{Q\to H}(z)(1+\frac{\alpha_s(\mu_R)}{2\pi}\beta_0 \ln\frac{\mu_R^2}{m_Q^2}+(\frac{\alpha_s(\mu_R)}{2\pi})^2....) \quad (1)$$

- Chram fragmentation function Peterson fragmentation function

$$D_{Q\to H}(z) = N_H \frac{z(1-z)^2}{[(1-z)^2+\epsilon z]^2}\ , \quad (2)$$

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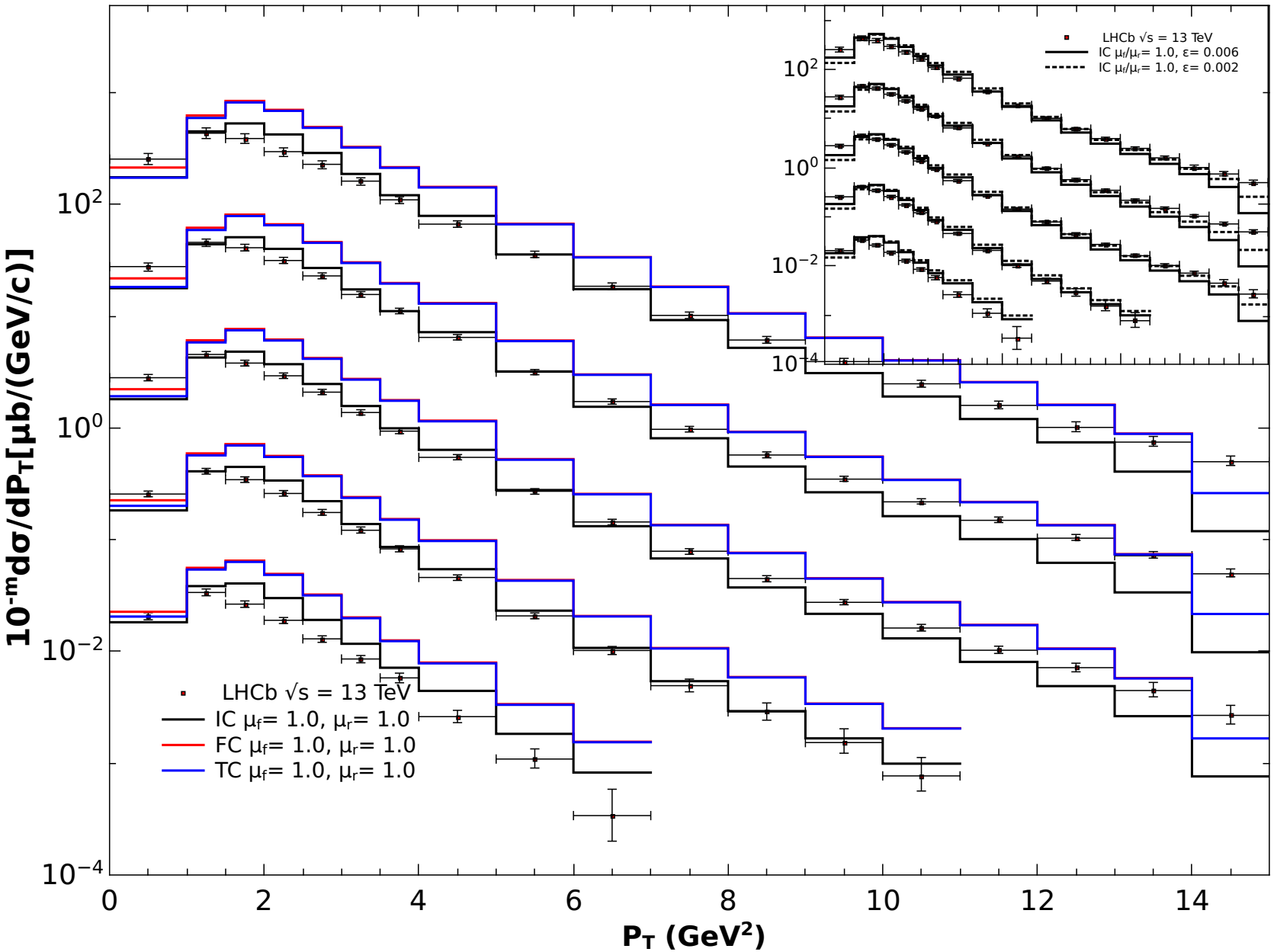
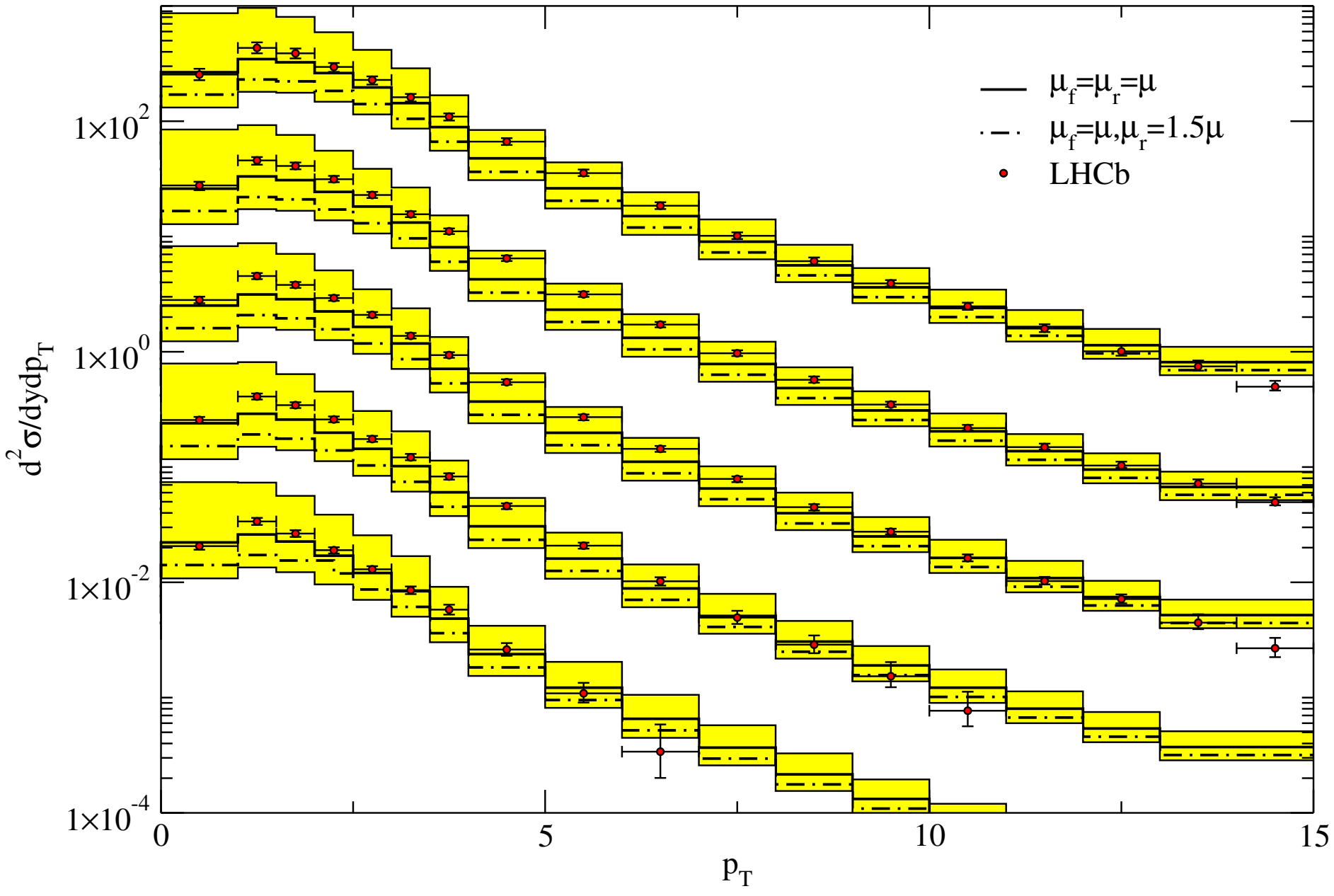
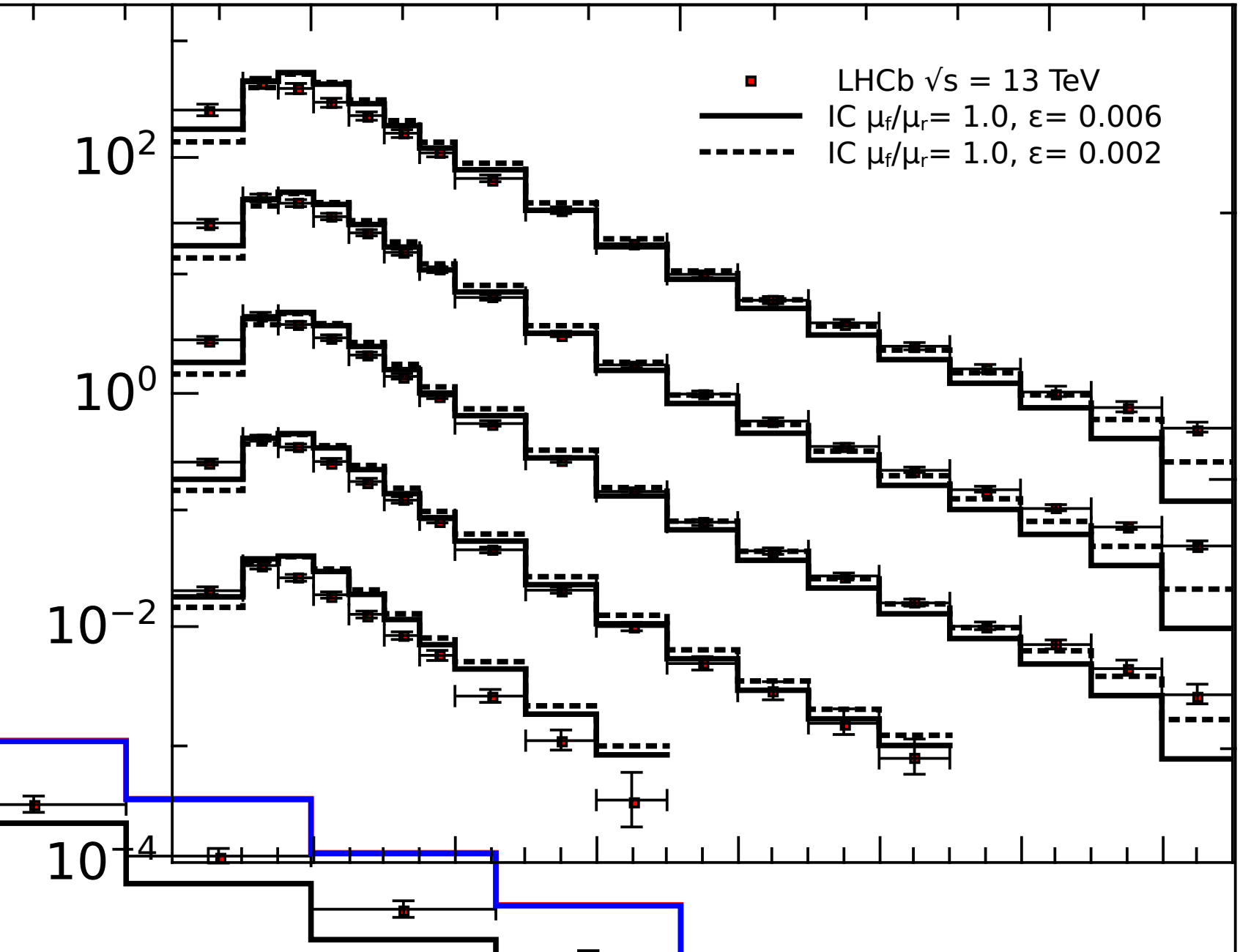
results


LHCb √s = 13 TeV
IC μf= 1.0, μr= 1.0
FC μf= 1.0, μr= 1.0
TC μf= 1.0, μr= 1.0
LHCb √s = 13 TeV
IC μf/μr= 1.0, ε= 0.006
IC μf/μr= 1.0, ε= 0.002
10-mdσ/dPT[μb/(GeV/c)]
PT (GeV2)

results


$\mu_f=\mu_r=\mu$
$\mu_f=\mu,\mu_r=1.5\mu$
LHCb
1×10^{2}
1×10^{0}
1×10^{-2}
1×10^{-4}
$d^2\sigma/dydp_T$
0
5
10
15
p_T

results



Thank You