Format of plot for TMD impact studies in pre-TDR document

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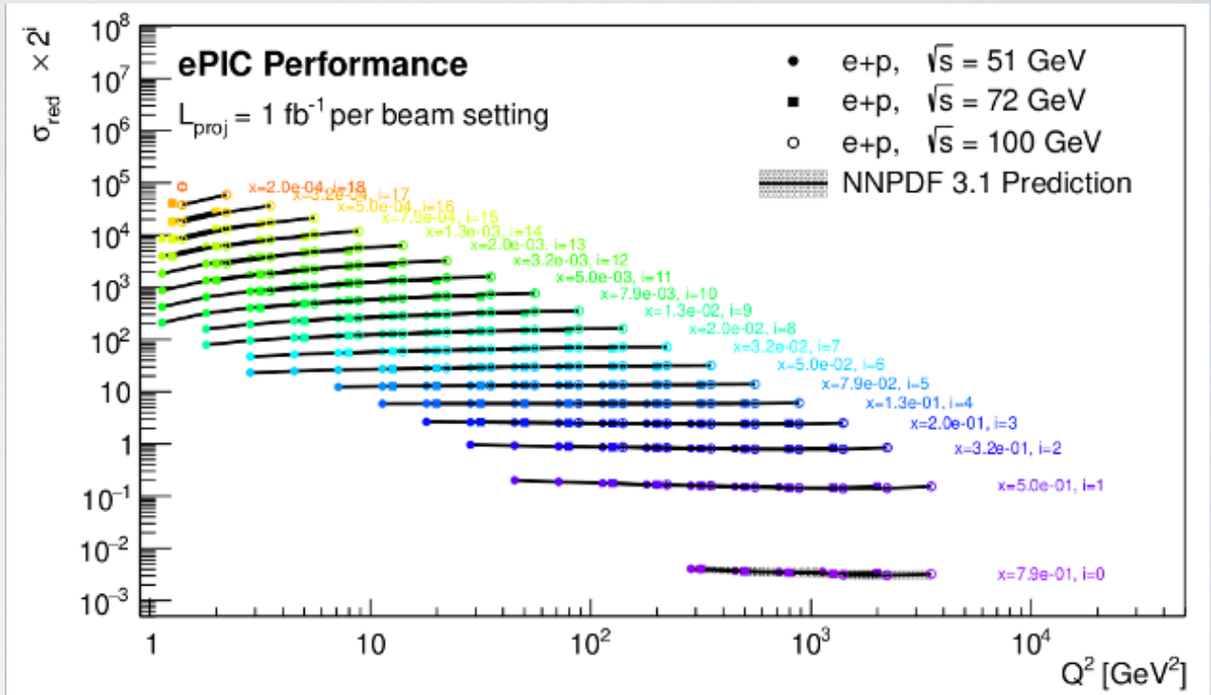
proposed “HERA-like” plot

Something like this, i.e. showing
- $d\sigma/dxdQ^2$ for unpolarized SIDIS
- at specific (z, P_{hT})

or
- integrated in (z, P_{hT})

Purpose: assess EIC capability of constraining TMD evolution



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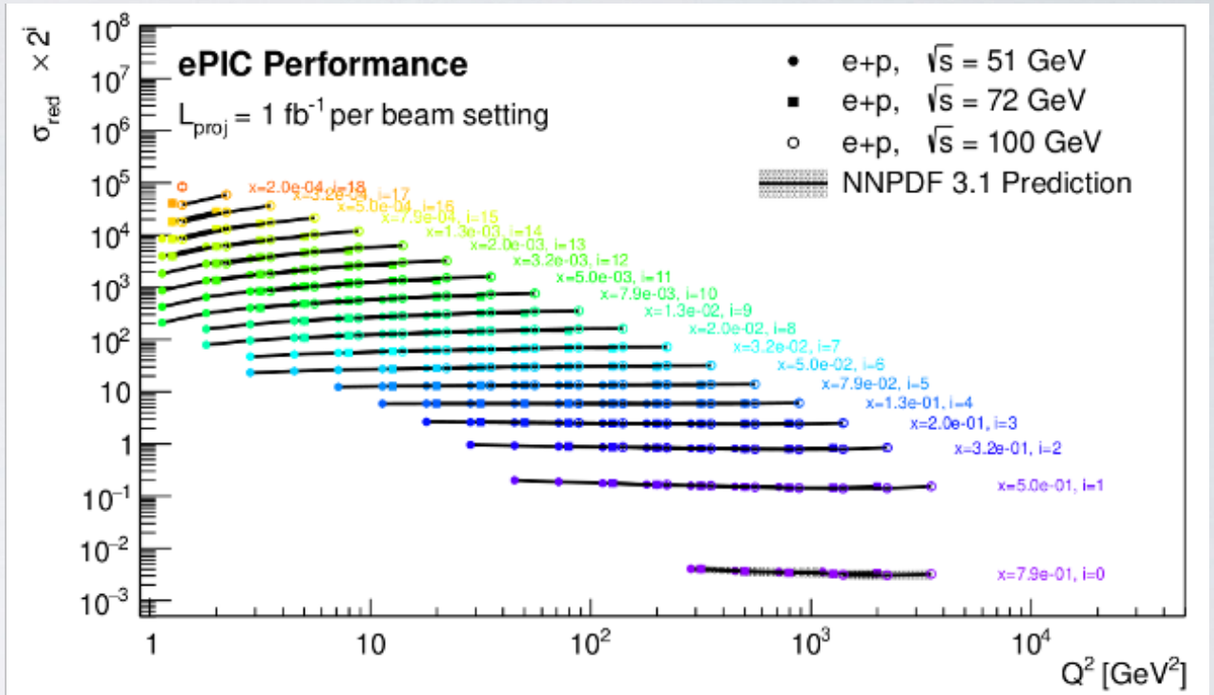

$$\tilde{f}_1^q(x, b_T^2; \mu_f, \zeta_f) = \left[C \otimes f_1\right](x, \mu_{b_*}) \exp\left[\int_{\mu_{b_*}}^{\mu_f} \frac{d\mu}{\mu}\left(\gamma_F - \gamma_K \log\frac{\sqrt{\zeta_f}}{\mu}\right)\right] \exp\left[K(b_*, \mu_{b_*}) \log\frac{\sqrt{\zeta_f}}{\mu_{b_*}}\right] \exp\left[g_K(b_T)\log\frac{\sqrt{\zeta_f}}{Q_0}\right] f_{\rm NP}(x, b_T)$$

usually, $\mu_f^2 = \zeta_f = Q^2$

$$\mu_{b_*} = \frac{2e^{-\gamma_E}}{b_*(b_T)}$$

- Collins-Soper (CS) kernel depends on b_T and Q, does not depend on x
- model dependence of CS kernel at large b_T (small P_{hT}), while all extractions agree at small b_T (large P_{hT}) because driven by perturbative QCD

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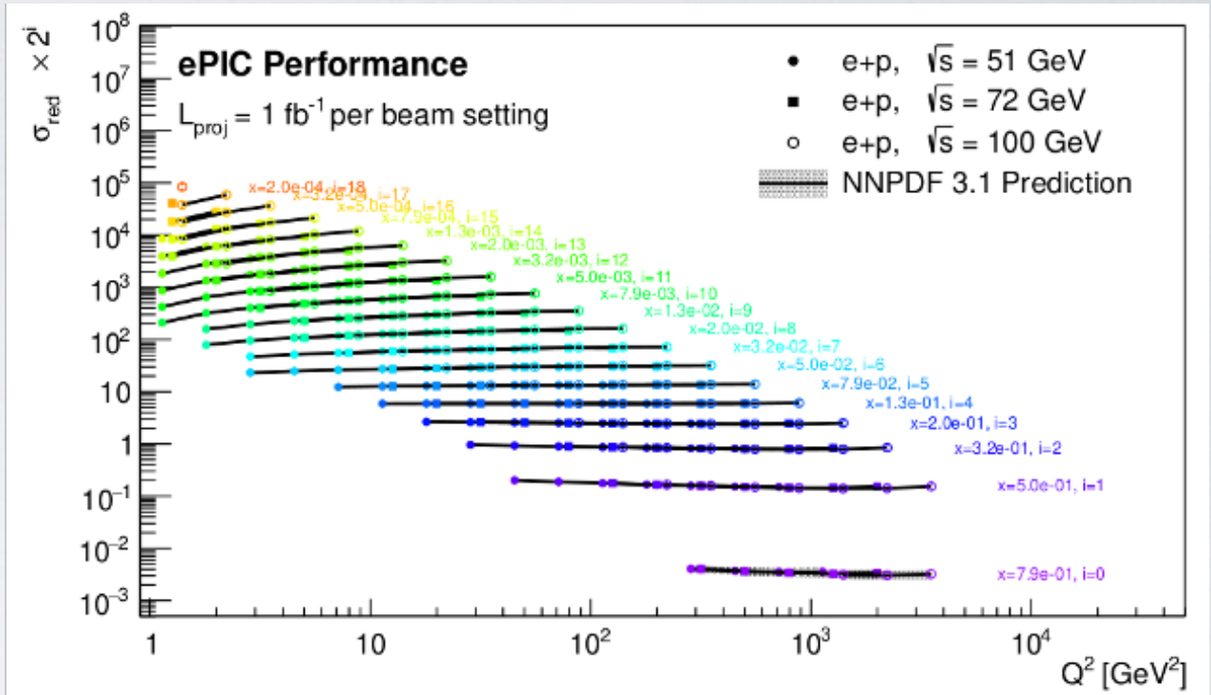

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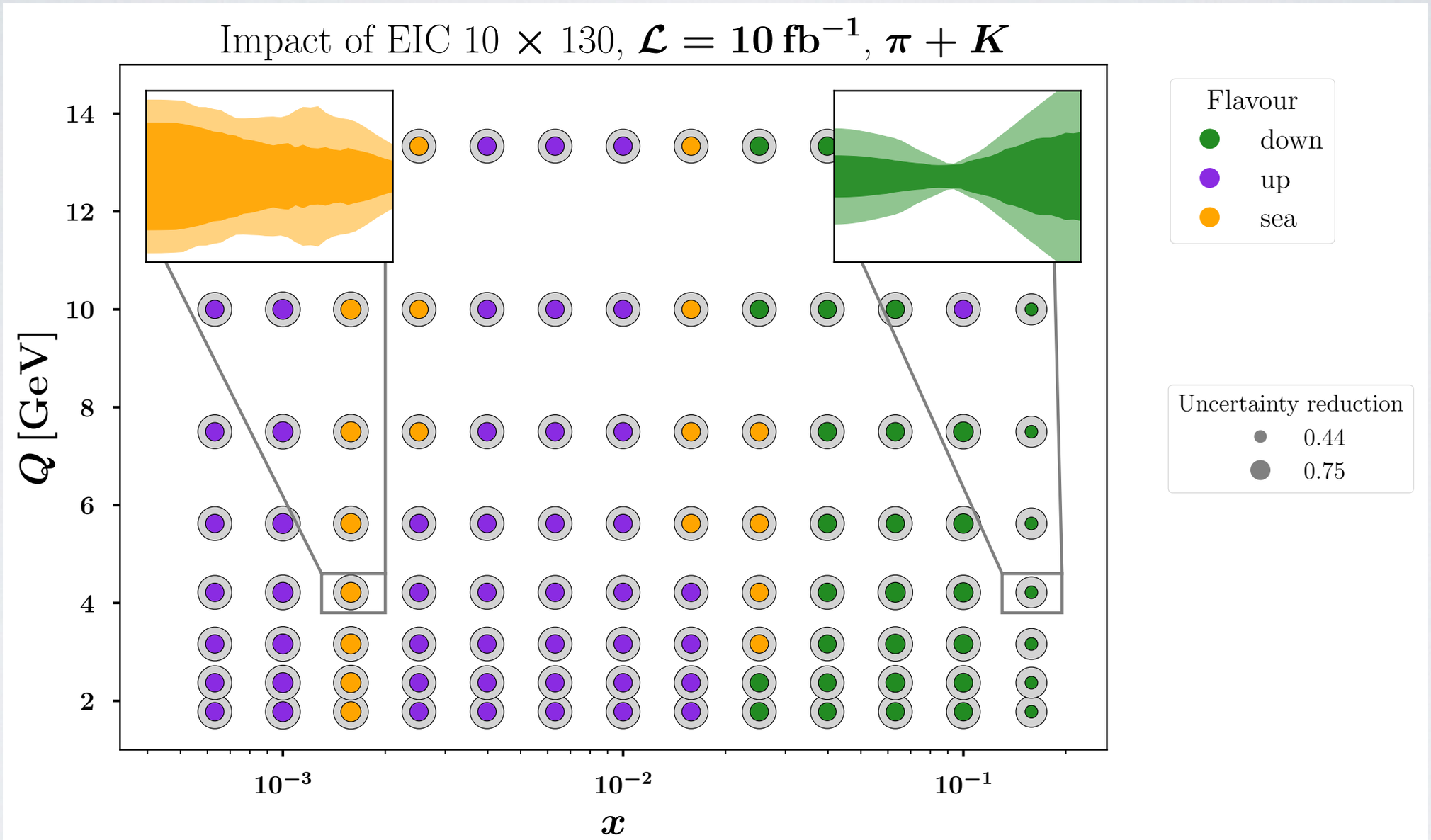
in order for the EIC to constrain model dependence in TMD evolution,
we need to be sensitive to P_{hT}, not to x ⇒ “HERA-like” plot not the best choice…

proposed compact plot for impact studies

SIDIS on proton target with all charged pions and Kaons in final state



To do: - slightly enlarge the insets
- add labels to inset axis, and specify the z