EIC YR proton 'money plots'

- currently analyzing the final baseline pseudodata from Friday afternoon

  → NC: $e^- p$, $e^- d$

  → CC: $e^- p$

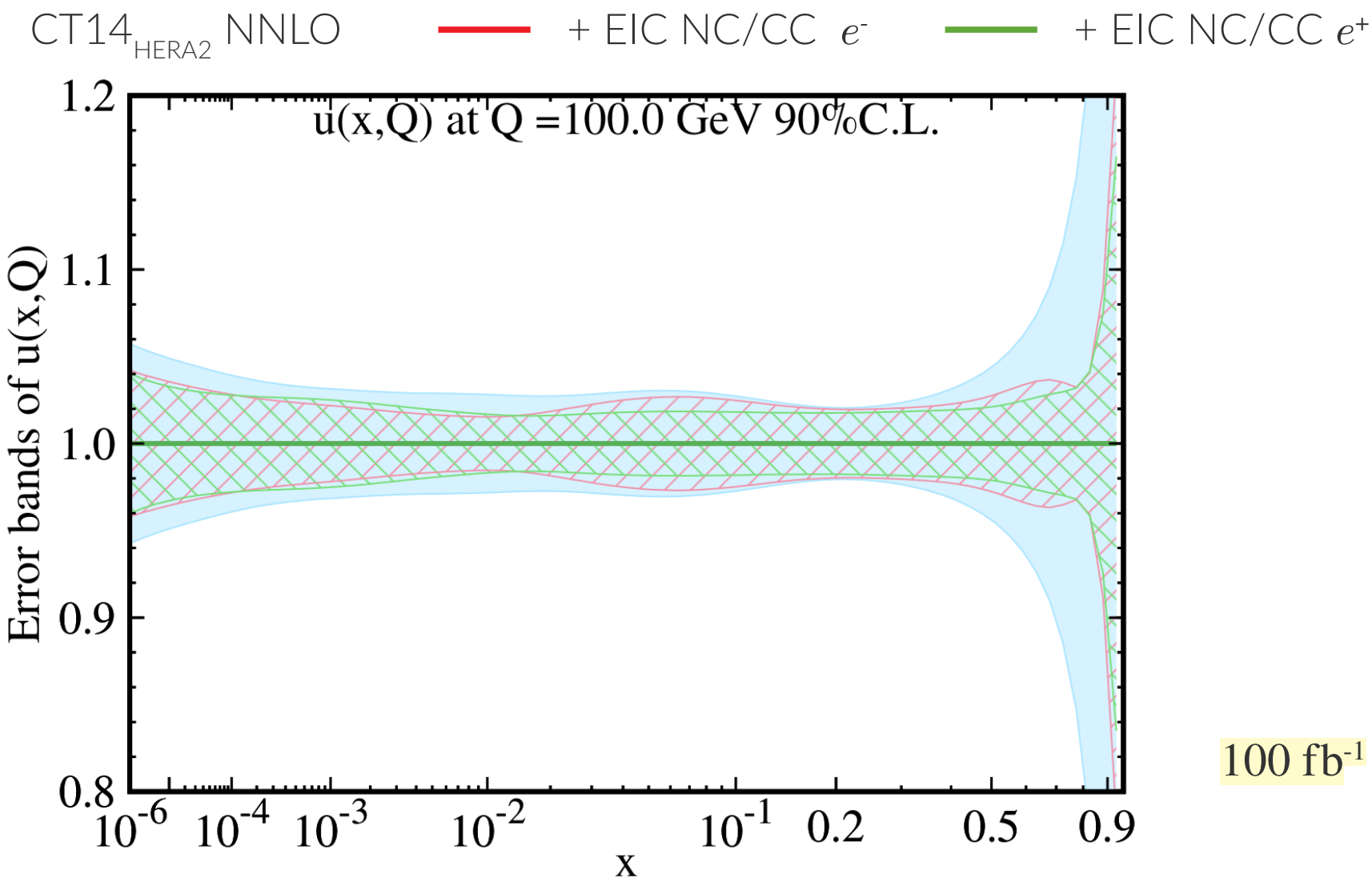
- convergence expected this week

- have multiple CT14-based analyses of earlier (similar) pseudodata

  → placeholders available

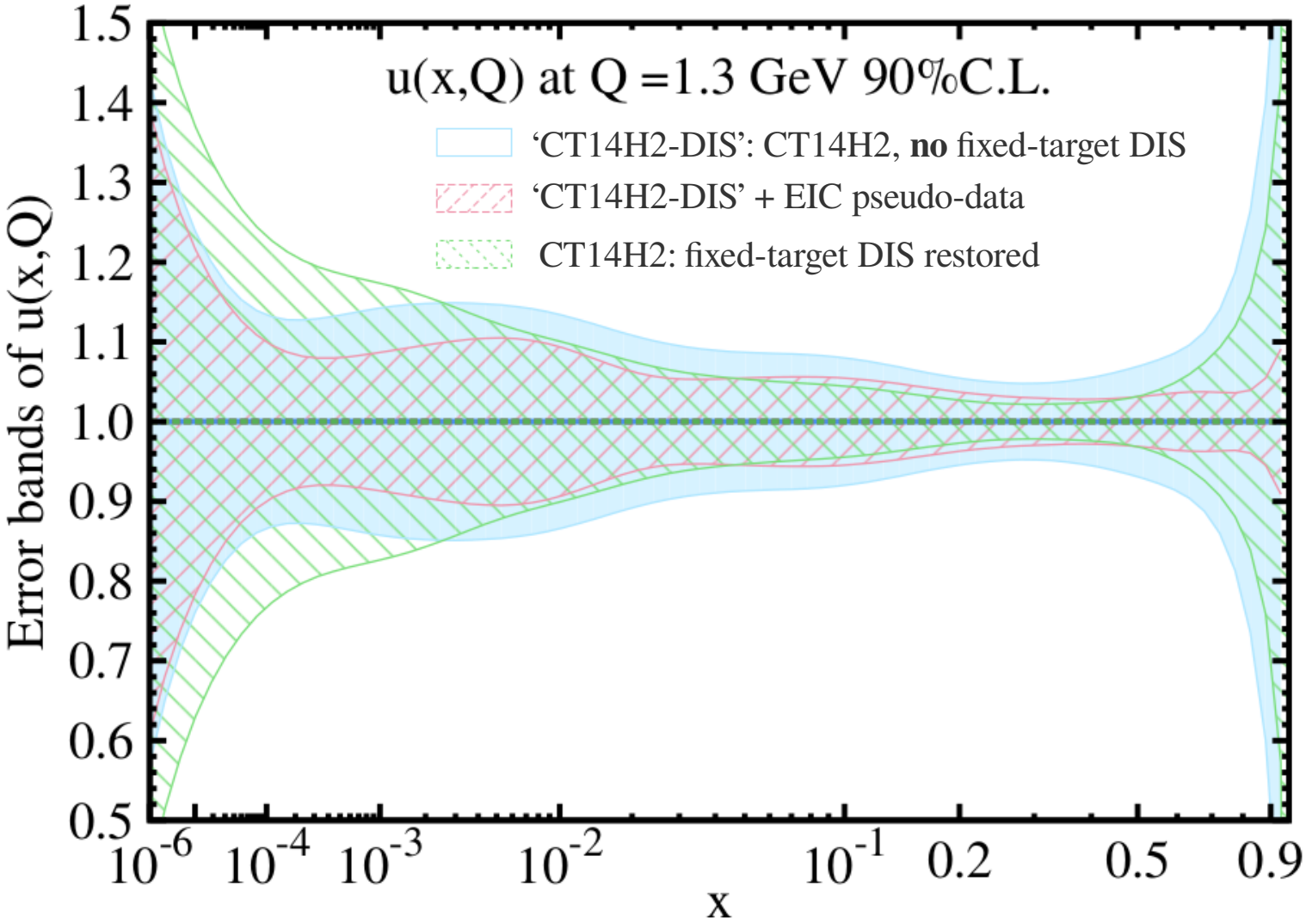
direct fits of EIC pseudo-data

- these plots will presumably combine (LHA files) in summary plots; show g, d/u, …
- CT18 fits with final baseline currently running (below, earlier CT14-based calc.)



Hessian profiling [ePump] for EIC impacts on PDF errors

Impact of EIC on collinear PDFs



- profiling results better adapted for quick studies with wide discrepancies in N_{pt}

  → e.g., EIC impact on top of DIS-free fit (above)

Impact of EIC on collinear PDFs

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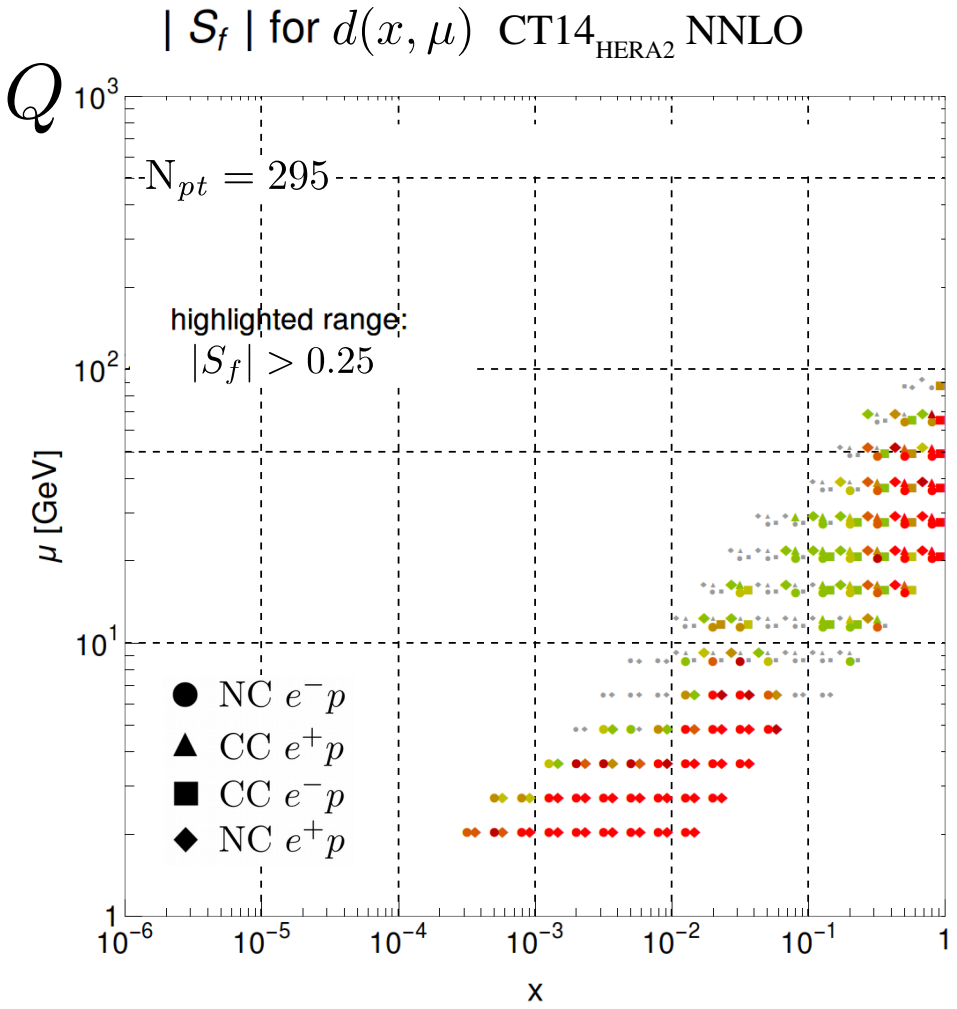
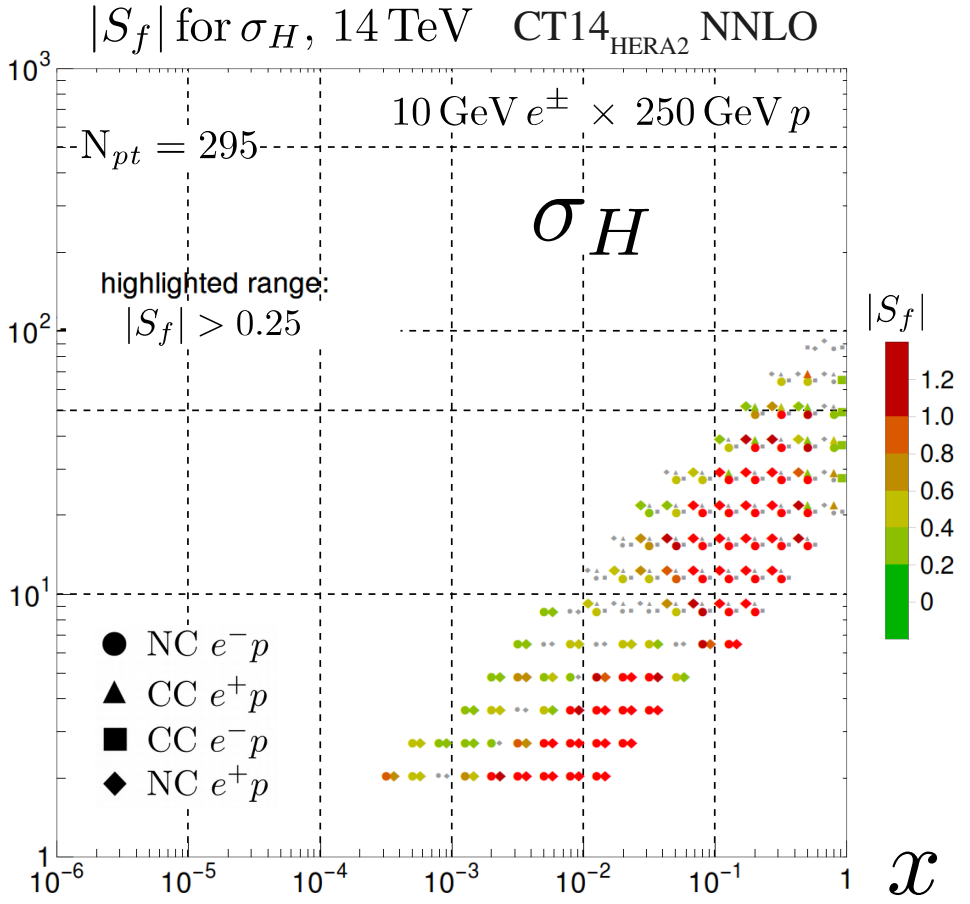
- PDFSense: handy maps of the per-datum PDF pulls; show kinematic regions of strong pull

  → CT18-based pseudodata maps can be ready shortly (this week – fitting not needed)



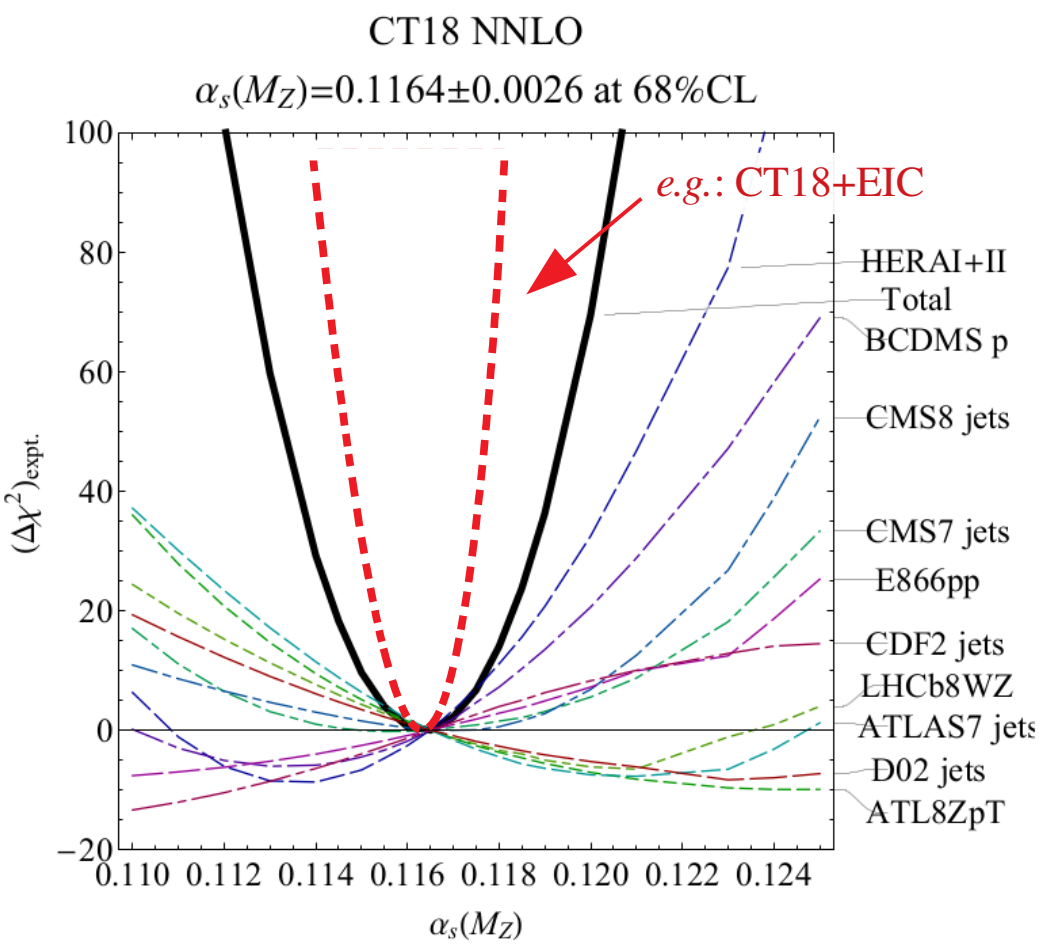


SM impact plots also possible

Electroweak and BSM physics

- CT18+EIC BL constraints to α_s

  → will require few extra days to run…

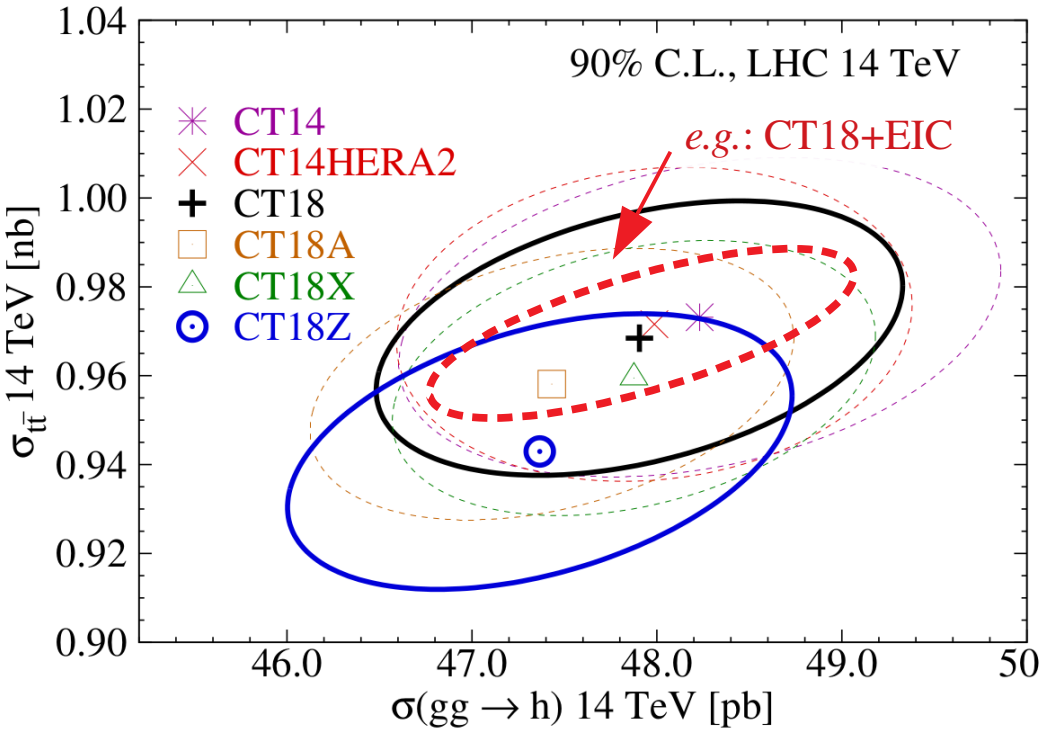


Implications of PDF determinations for pp, pA physics

- constraints to Higgs, ttbar X-sect.

  → can be generated once fit converges

  → EW plots also (W/Z incl. X-sect.)



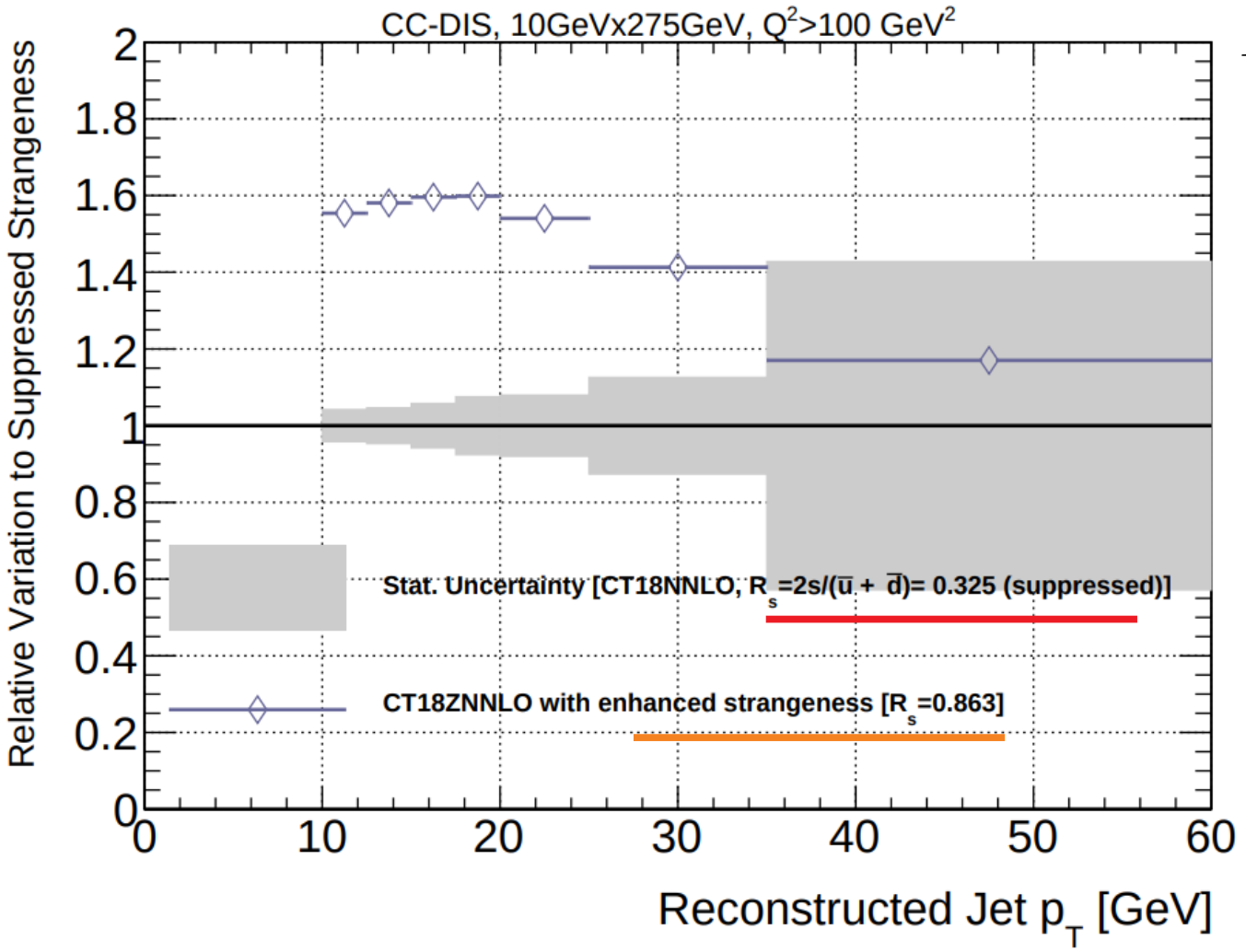
charge-current charm-jet production sensitive to strange sea

Arratia, Furletova, Hobbs, Olness, Sekula

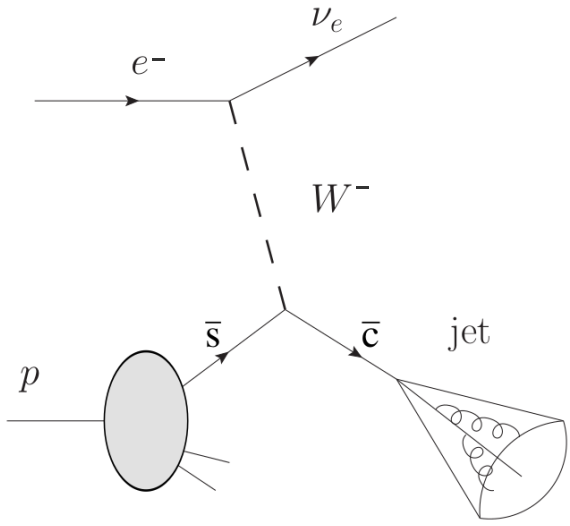
Sea quark PDFs via SIDIS measurements

- 100 fb^{-1} CC DIS (10M simulated events), at 10x275 GeV (e^- on p); Q^2 > 100 GeV^2

- **even assuming conservative charm-tagging efficiency, event-level discrimination potential is substantial, relative to statistical uncertainties**



$$R_s = \frac{s+\bar{s}}{\bar{u}+\bar{d}} \quad = 0.325\ (\mathrm{CT18})^* \quad = 0.863\ (\mathrm{CT18Z})^*$$



final-state tagging will provide a critical lever arm for flavor separation

supplemental: high-energy EIC pseudodata

- reach in center-of-mass energy, $20 \leq \sqrt{s} \leq 140\,\mathrm{GeV}$

  → luminosities 2-3 decades greater than at HERA

  → á la HERA, the combination of precision & kinematic coverage provide constraining 'lever arm' on QCD evolution

  → QCD evolution: (**high x, low Q**) ↔ (**low x, high Q**)

- as a generic scenario, we consider here the simulated impact of a machine with: $10\,\mathrm{GeV}\ e^{\pm}$ on $250\,\mathrm{GeV}\ p$ $(\sqrt{s} = 100\,\mathrm{GeV})$

~year of data-taking

$\mathcal{L} = 100\,\mathrm{fb}^{-1}\ e^{-}$ pseudodata

$\mathcal{L} = 10\,\mathrm{fb}^{-1}\ e^{+}$ pseudodata

→ NC/CC

→ currently, proton scattering only

- generated based on $\mathrm{CT14}_{\mathrm{HERA2}}$ NNLO PDF fit