

Feedbacks and Updates from Physics Readiness Workshop

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Joint Inclusive/EW+BSM PWG Meeting, 03/24/2026



UNIVERSITY OF
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Center for Frontiers
in Nuclear Science

Feedback on ESR (main document)



- Highlighted studies look like what we have available, rather than something logical to reader
 - “Impact” plots preferable
- Need to acknowledge current “state of the art”
- Suggestion for table for each physics section to clarify the observables and what we learn from them (like in white paper)

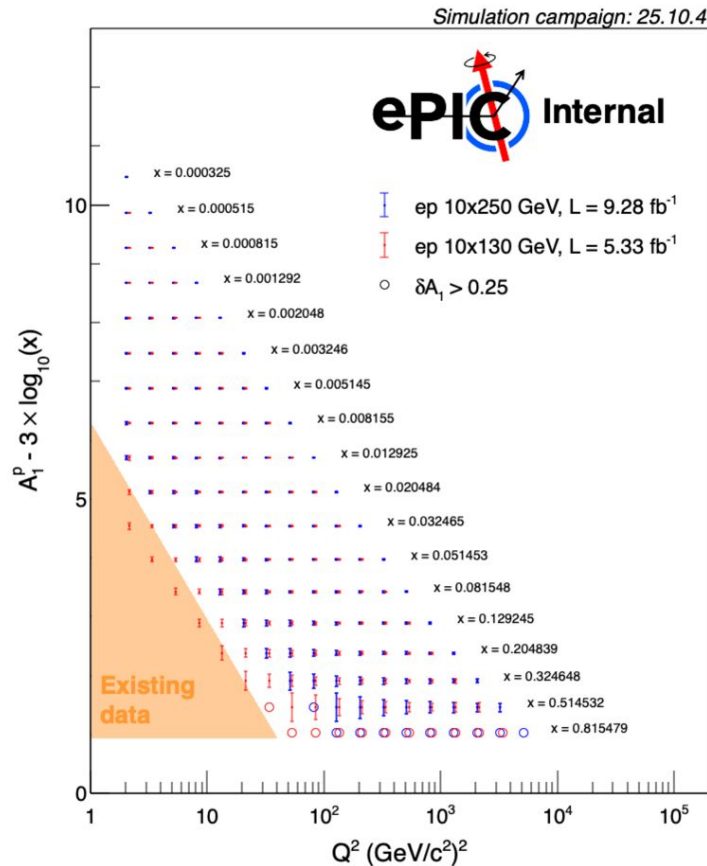
Deliverables	Observables	What we learn
Sivers & unpolarized TMD quarks and gluon	SIDIS with Transverse polarization; di-hadron (di-jet)	Quantum Interference & Spin-Orbital correlations 3D Imaging of quark’s motion: valence + sea 3D Imaging of gluon’s motion QCD dynamics in a unprecedented Q^2 (P_{hT}) range
Chiral-odd functions: Transversity; Boer-Mulders	SIDIS with Transverse polarization	3 rd basic quark PDF: valence + sea, tensor charge Novel spin-dependent hadronization effect QCD dynamics in a chiral-odd sector with a wide Q^2 (P_{hT}) coverage

↑ Example from EIC white paper

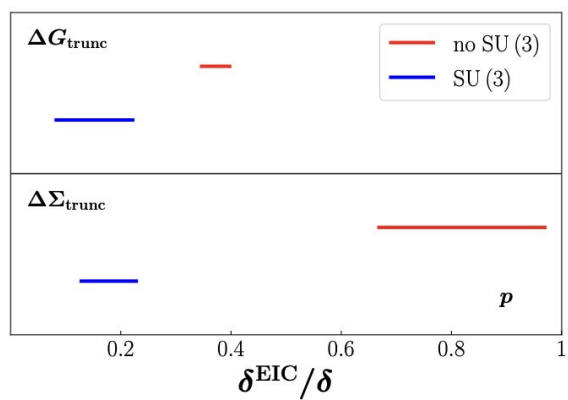
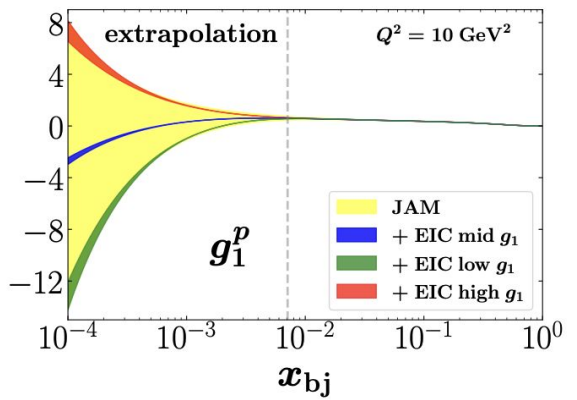
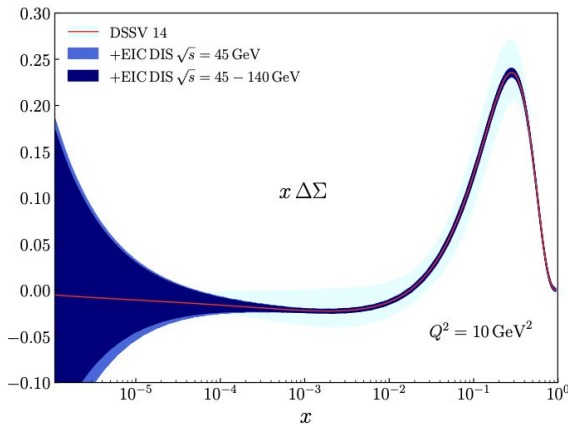
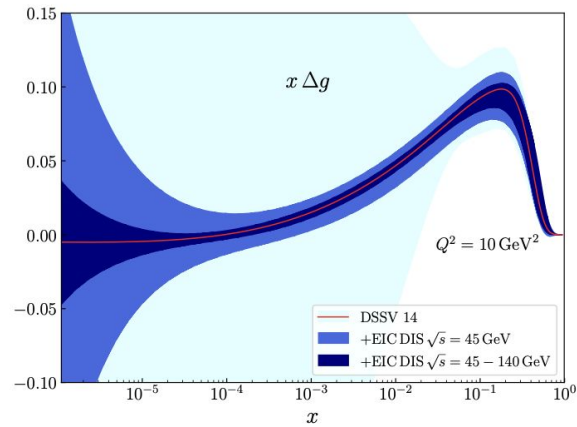
Feedback on ESR (main document - inclusive)



- Proton PDF and structure function impact is good
- Suggest converting A_1 plots to impact plots (helicity PDF impact? Direct comparison to existing data?)
- **“Underplays importance of nPDFs - DIS on nuclei in a collider environment is new! This should feature prominently!”**
 - Plan: SM produce eA pseudodata, pass on to interested fitters



Feedback on ESR (main document - inclusive)



From yellow report

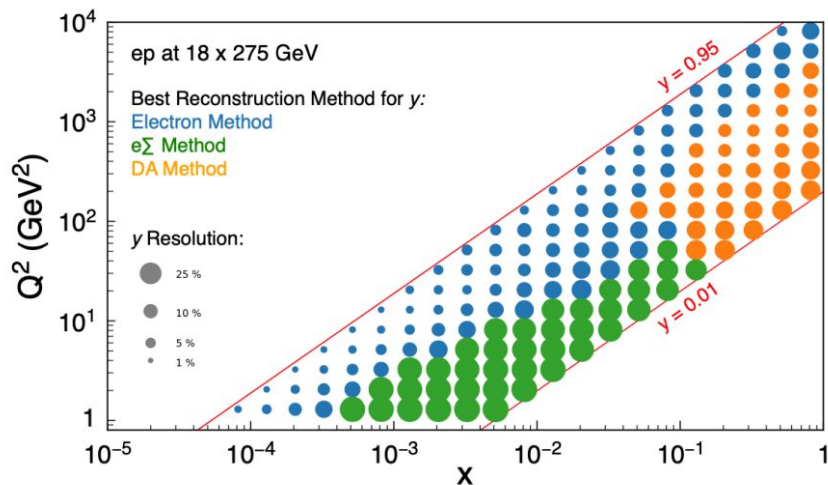


Contacted JAM group
Will also reach out to DSSV

Feedback on ESR (Appendix A.1-A.2)



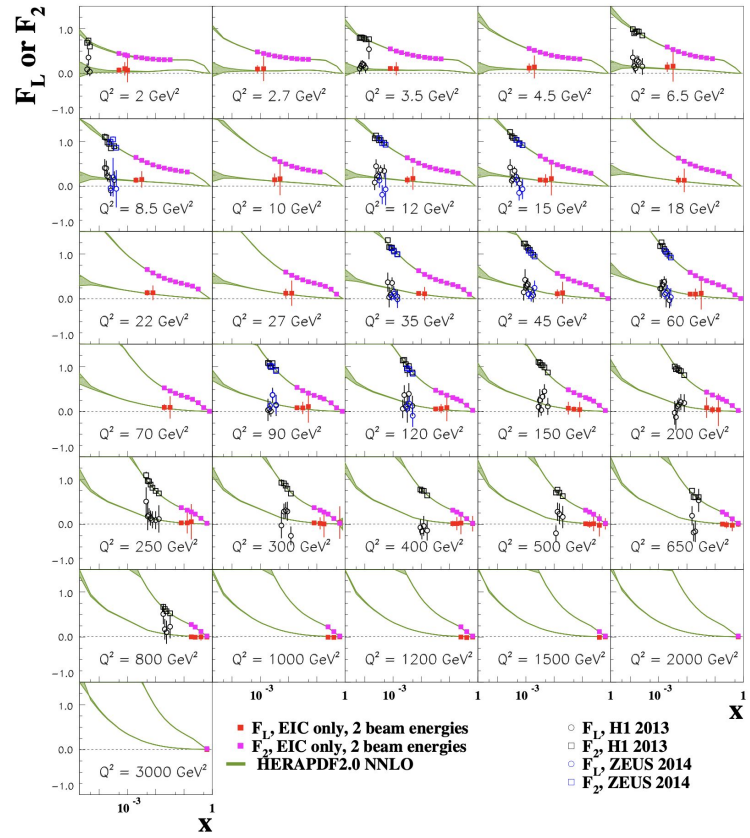
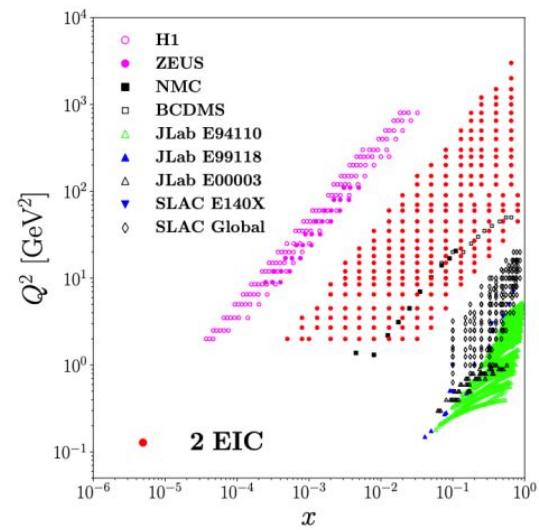
- Mixed comments for A.1 & A.2
- Appendices may be too much like analysis notes?
 - PWGs as a whole need to be clear what the plan is for the appendices - included or separate to main document
- Suggested to add performance plots for reconstructions



Feedback on ESR (Appendix A.4)



- Structure functions study would be “Better if jointly presented with a phase-space plot showing complementarity with HERA and Fixed-target FL measurements”



Important updates for the machine



- Some important updates to the plans for early science EIC (see [Elke's Talk](#)) - **not all decided**, but be aware of:
 - Likely reduction in the early science luminosities (some of the original plans for the accelerator have become “upgrades” -> stick to $\sim 1\text{fb}^{-1}$ for projections?)
 - 10 GeV electrons may become 9 GeV
 - 18 GeV electrons now an upgrade

Every single piece of EIC hardware is unique and critical for delivering the ultimate EIC performance.

This makes the EIC one of the most challenging and exciting, high-energy, high-luminosity, polarized beam accelerator complexes ever built.

There is currently a lot of movement in the EIC collider and its start-up configuration

BUT

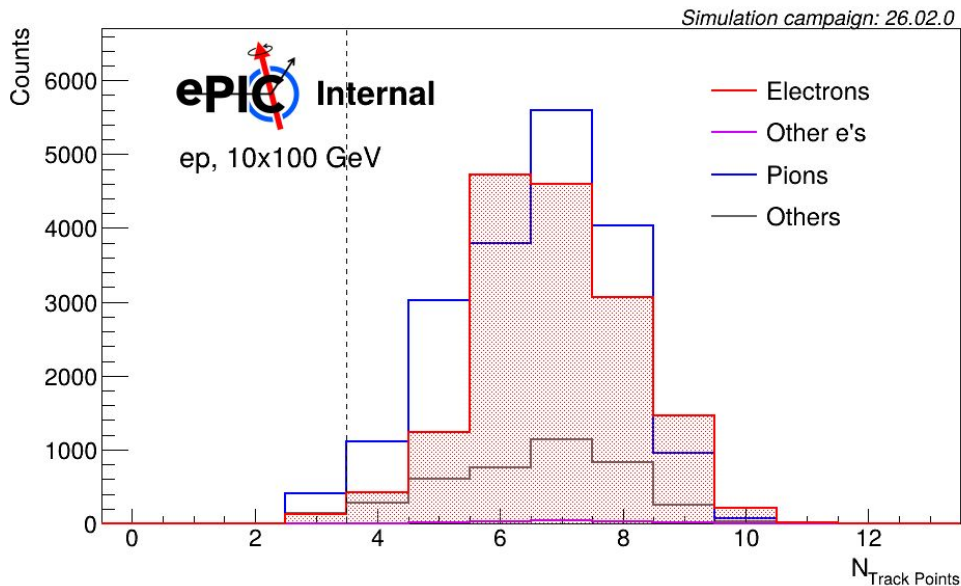
the goal is and remains to build the EIC we need to do the NAS science program and more

Everybody is dedicated to discuss potential changes early and their impact openly

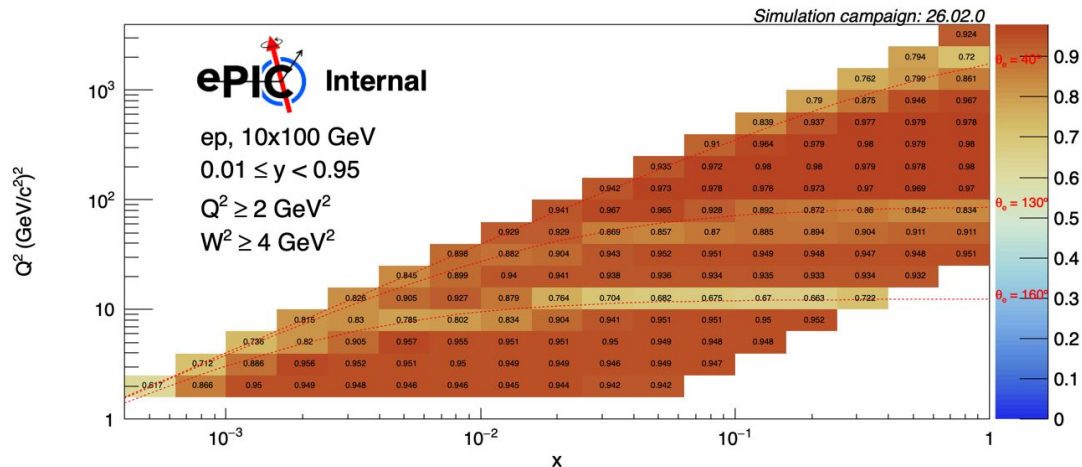
Important tracking update



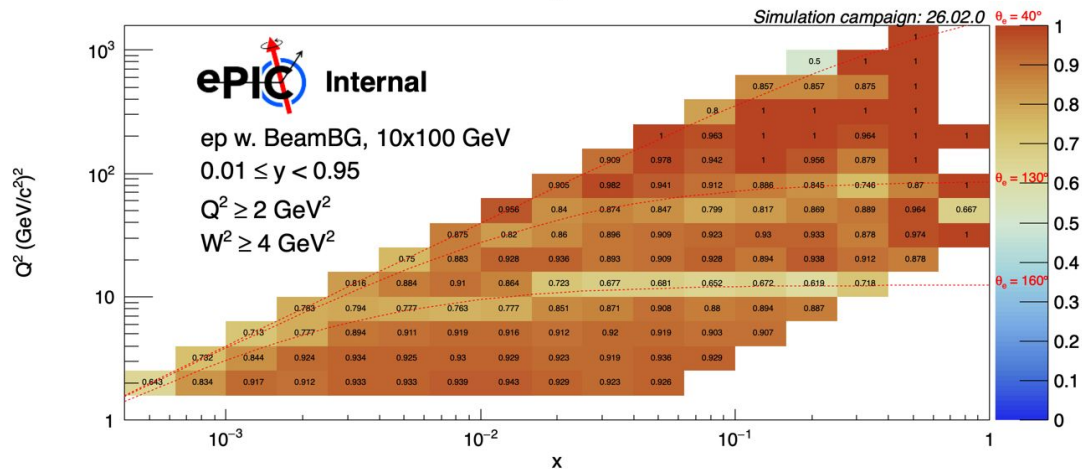
- Details in Shujie's presentation: [link](#)
- Tracking group has concluded to use 10 μ m gold coating for beampipe
 - Available as of March campaign
- Recommended to use tracks with at least 4 hits



eID with Beam Background - efficiency

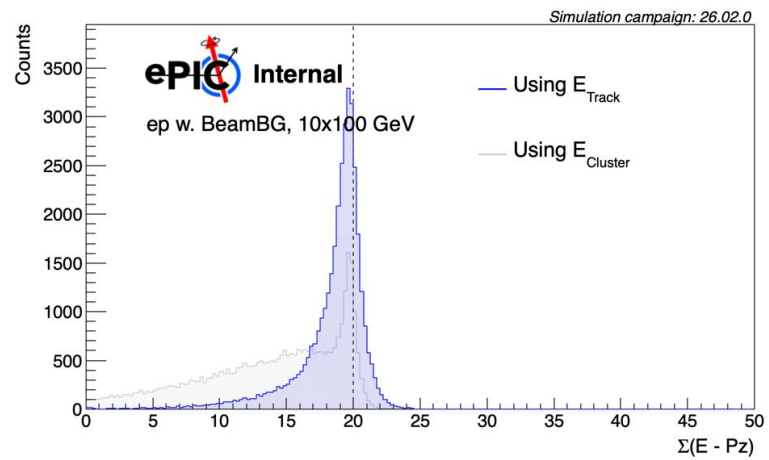
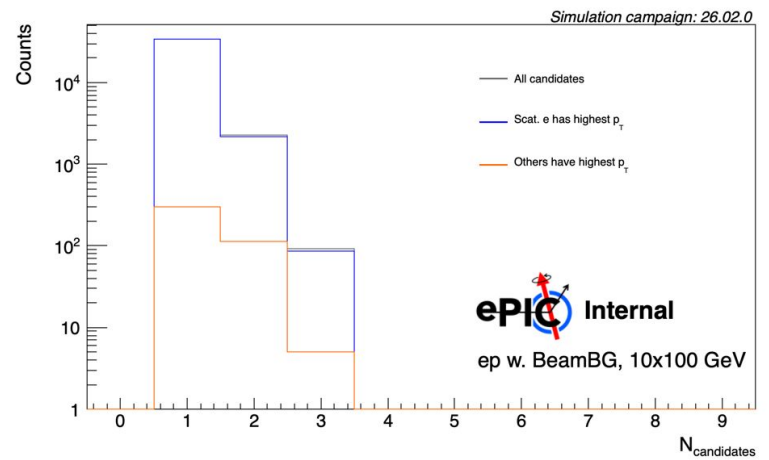
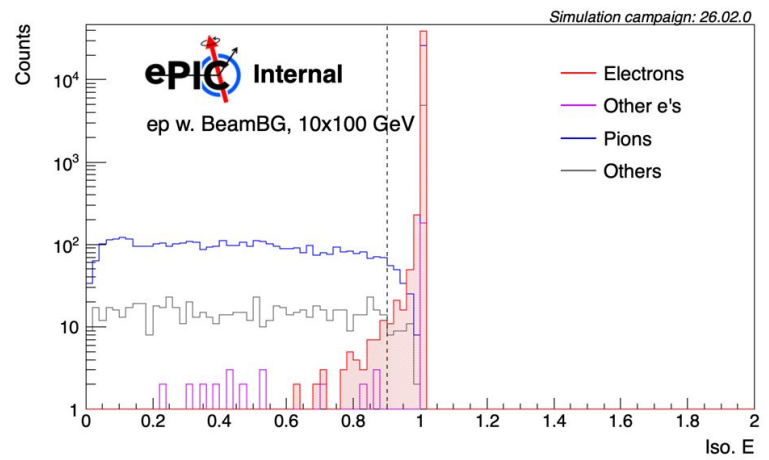
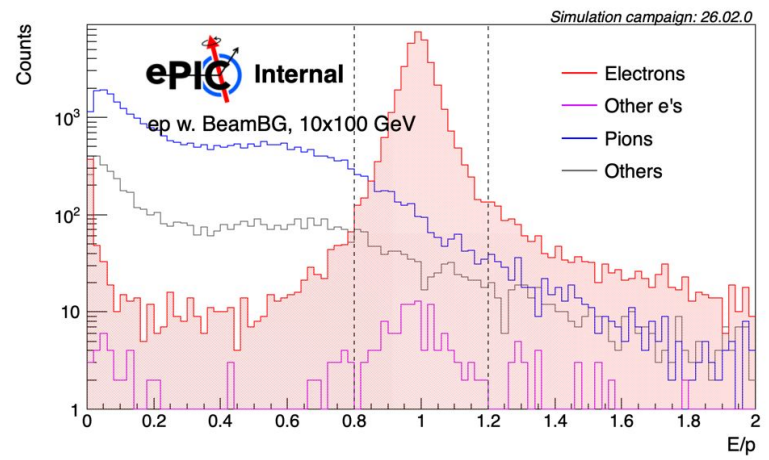


No background



10 $\mu\text{m Au}$, 1 DIS + 2 $\mu\text{s bg}$
 > 3 track points

eID with Beam Background



Group paper?



- NIM A special issue is opened for submission until at least Oct. 2026 ([details](#))
- Appendix may or maynot be moved to separated papers
- Do we want an inclusive (early science) measurement paper?
 - More detailed discussions than what we can do in appendix
 - Publication policy for author list is being reconsidered

Plan for paper



- We should work towards a finished draft ASAP
 - Oct. 2026 NIMA deadline (not fixed)
 - Approval takes time
 - Other paper/groups can refer to our work
 - At some point we will be busy with preTDR again
- Will communicate immediately with PAC, Pub. Committee and SP Office
- Will create template and create first draft with everything we already have in three weeks
- New studies will need analysis note and need to be released at physics forum
- Reviewers before sending draft to the whole collaboration?

Ideas/outline

- Introduction and phase space coverage
- Analysis technique
 - DIS electron identification
 - Kinematic reconstruction
 - Machine learning approach
 - Systematics assumption
 - Background consideration
- Physics impact
 - NC cross section
 - F2, FL
 - Proton PDFs
 - eA F2 ratio
 - nPDFs
 - A1, g1
 - Alpha_s
- Radiative correction
- Outlook for EIC full running?
 - CC cross section

- Same for all our studies with additional discussion in later sections
- Other PWG can also refer to this section

- Mostly in ESR appendix already.
- Need to avoid overlaps if appendix will be published
- Can be more brief in appendix and refer to details here