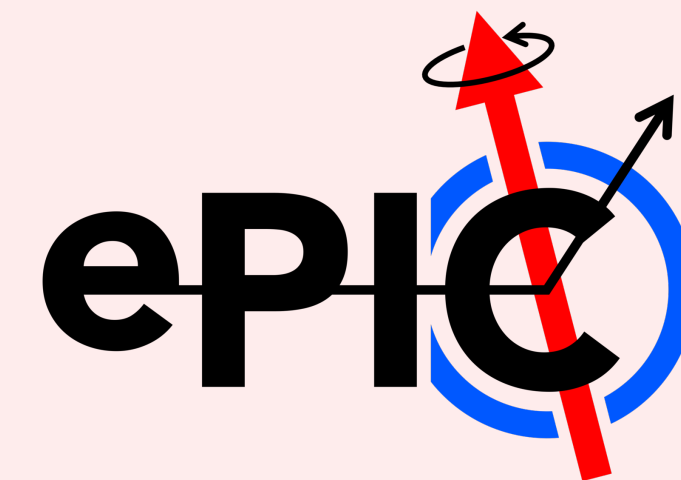
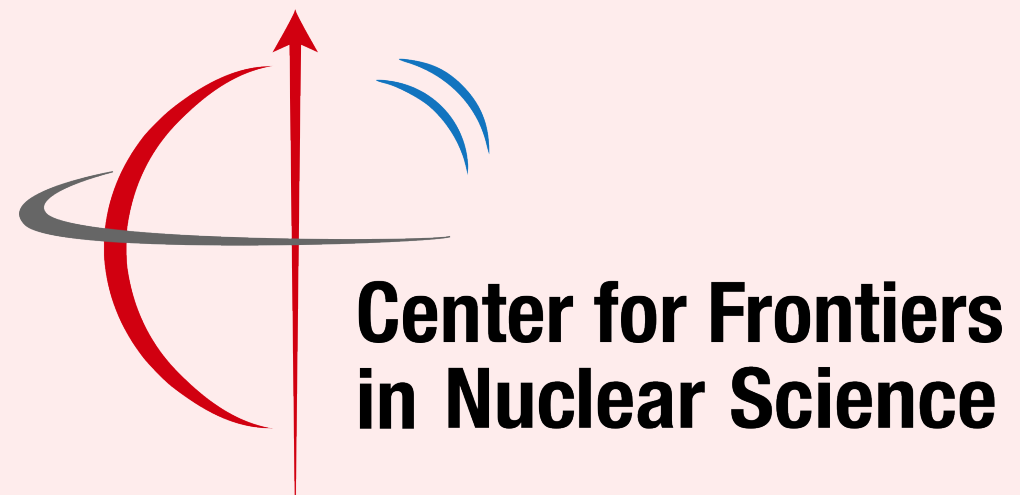


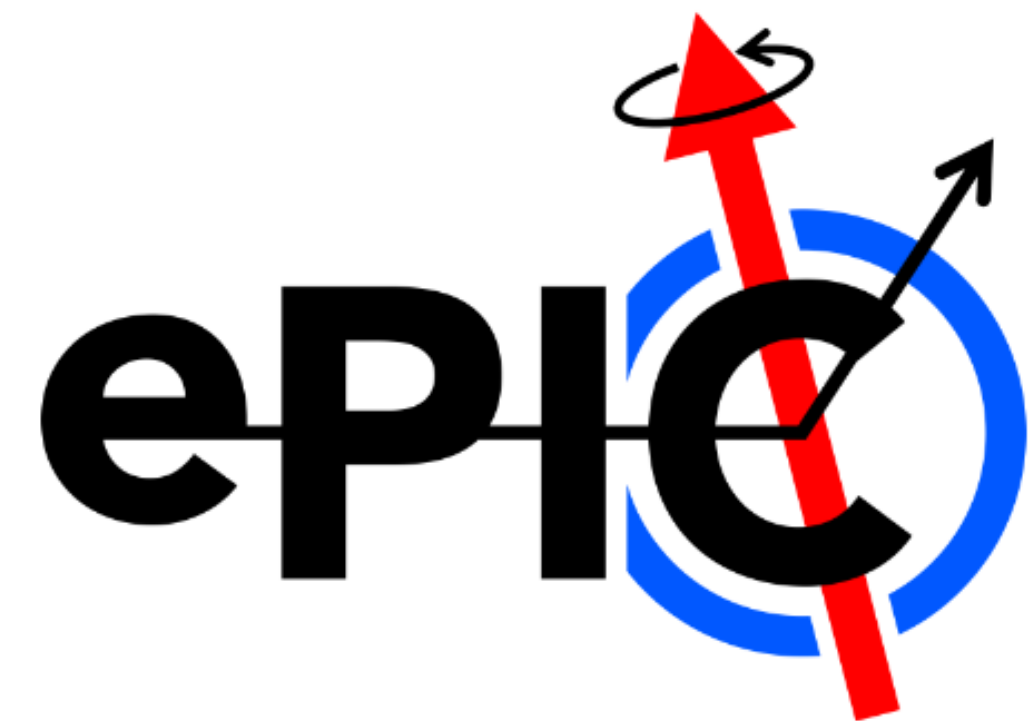
Progress report on g1n analysis note

Win Lin
Stony Brook University

Exclusive physics group meeting
06/30/2025



- 60% done?
- Update on electron reconstruction
- QA plots almost all finished, need to change to paper format
- Will update plots, and (maybe) generate more events



Contents

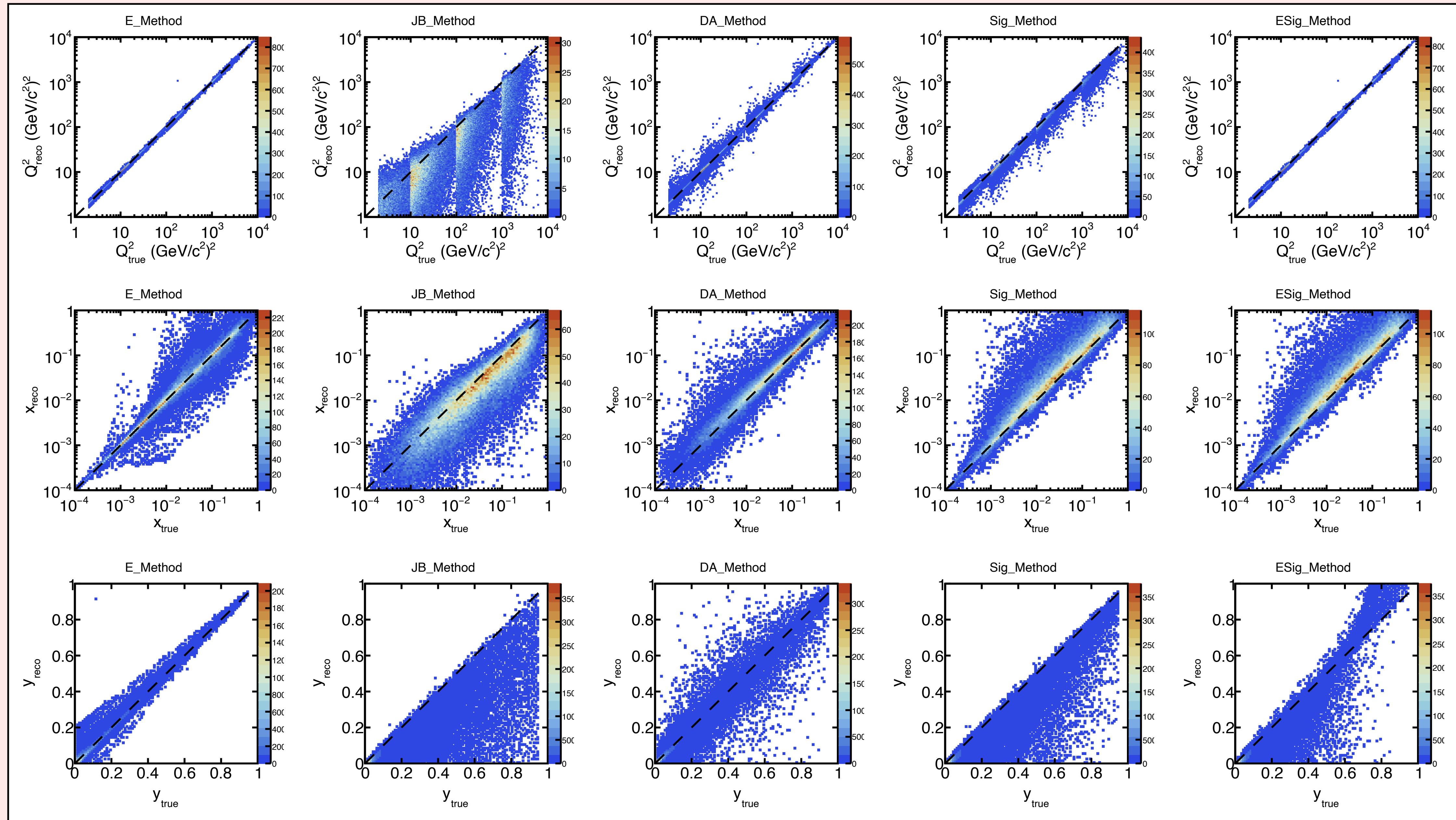
1 Introduction	1
2 Simulation Overview	1
3 Event Selection	2
3.1 Electron Reconstruction	3
3.2 Spectator Tagging	4
4 Projection Analysis	5
5 Results	7
6 Discussion	7
7 Conclusion	7

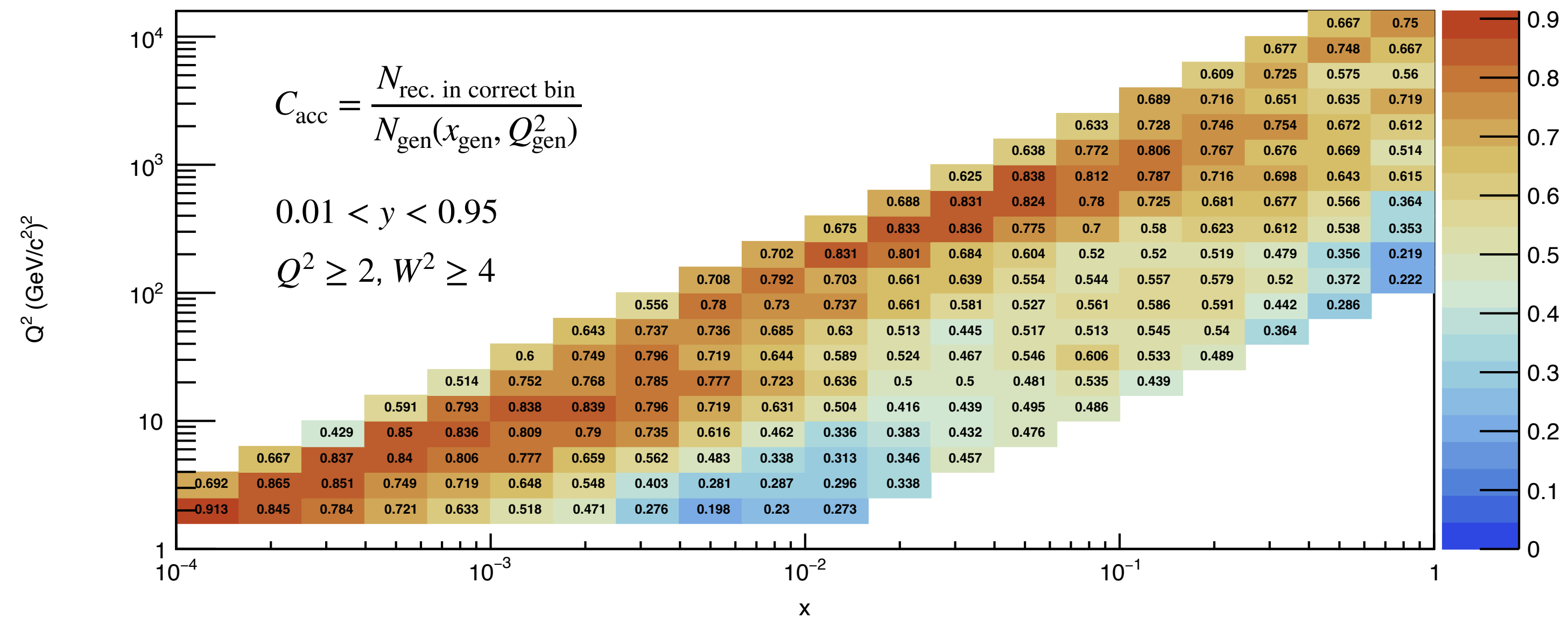
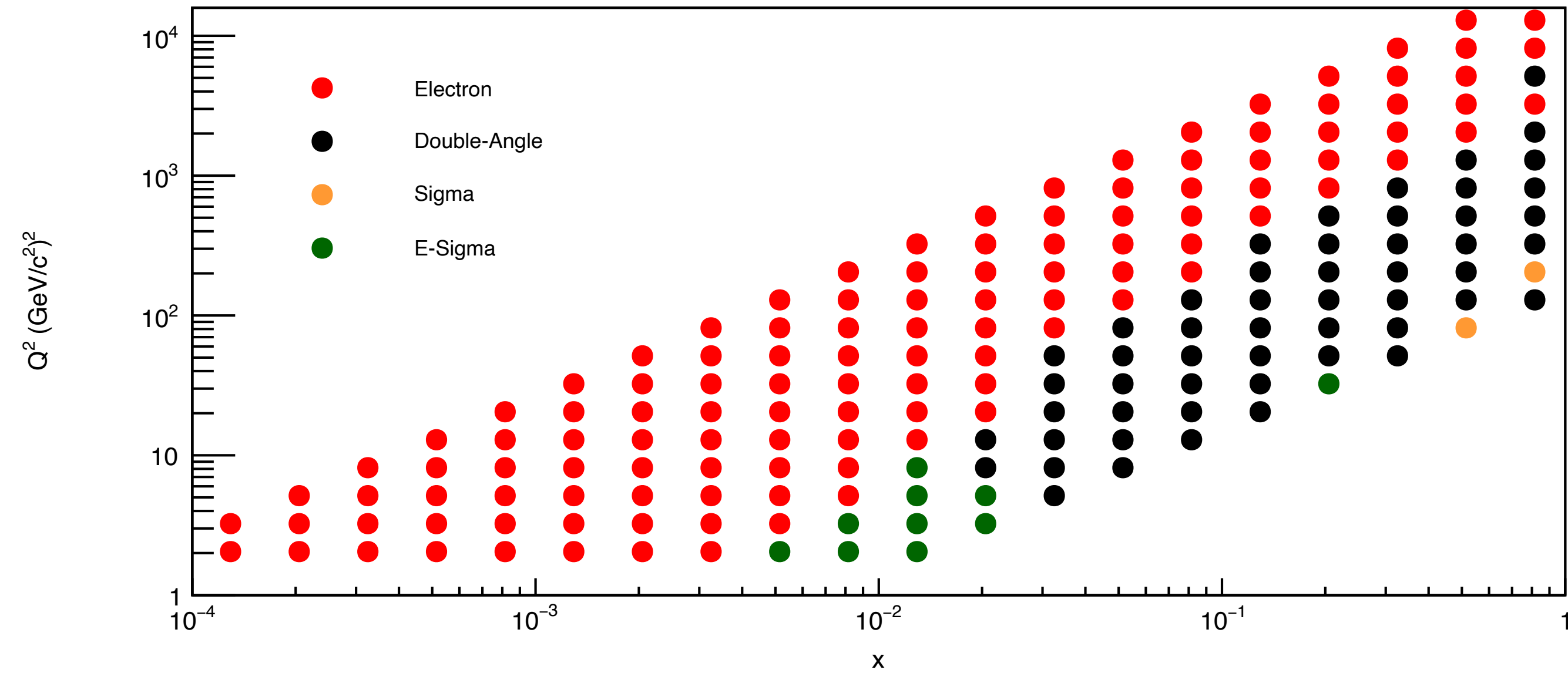
- 60% done?
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Example list of variables/quantities for PWG to follow

Kinematic reconstructions	quantity	Reco	Truth	Response (2D)	Purity/bin migration	detector acceptance-only corrected	Unfolding/full correction
(electron,JB, DA,sigma, e-sigma)	Q2	yes	yes	yes	optional	good to have	optional
	x	yes	yes	yes	optional	good to have	optional
	y	yes	yes	yes	optional	good to have	optional
	dQ2/Q2						
	dx/x						
	dy/y						
	e' energy	yes	yes	yes	optional	optional	
	e' theta	yes	yes	yes	optional	optional	
	HFS (E-pz)	yes	yes	yes	optional	optional	
	HFS (pT)	yes	yes	yes	optional	optional	
Event level							
	E-pz (e'+HFS)	yes	yes	yes	optional	optional	
	E/p for calorimeter	yes	yes	yes	optional	optional	
	Calo clusters	yes	no	no			
Observable of interest							
	e.g., t, etc.	yes	yes	yes	yes	yes	optional
Detector specific variables	Depends						
PID quantities:	add when it comes						

This list is not and should not be frozen but a living document for analyzers. And this should be adapted to each analysis and experts (conveners, ACs) can request to add things to check





A_1^n from $e^3\text{He}$ DIS:

$$A_1(x, Q^2) \equiv \frac{\sigma_{1/2} - \sigma_{3/2}}{\sigma_{1/2} + \sigma_{3/2}} = \frac{A_{\parallel}}{D(1 + \eta\xi)} - \frac{\eta A_{\perp}}{d(1 + \eta\xi)}$$

$$\mathcal{L} = 8.65 \text{ fb}^{-1}, P_e = P_n = 70 \%$$

Data split evenly between $A_{\parallel}$ and $A_{\perp}$

$$\delta A_{\parallel, \perp} = \frac{1}{\sqrt{N} P_e P_N}$$

Correction!

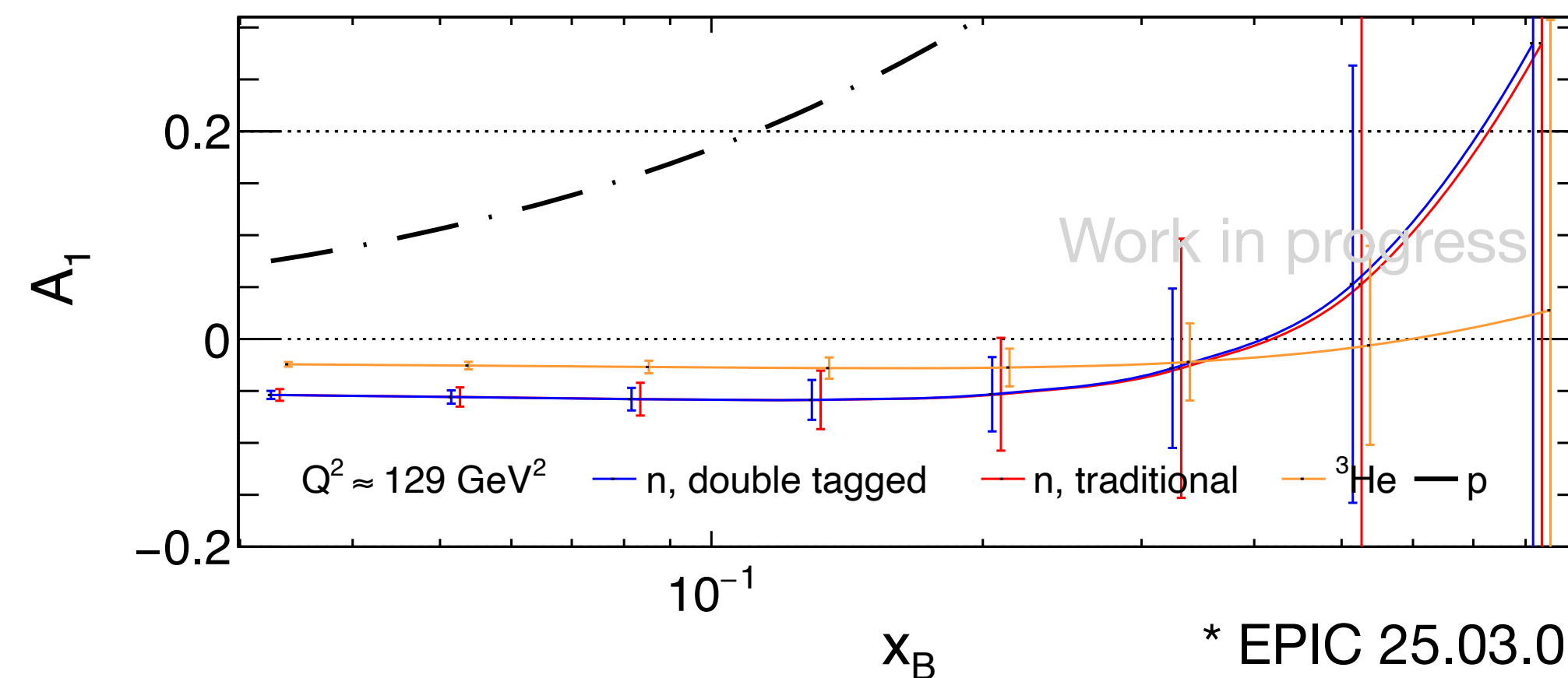
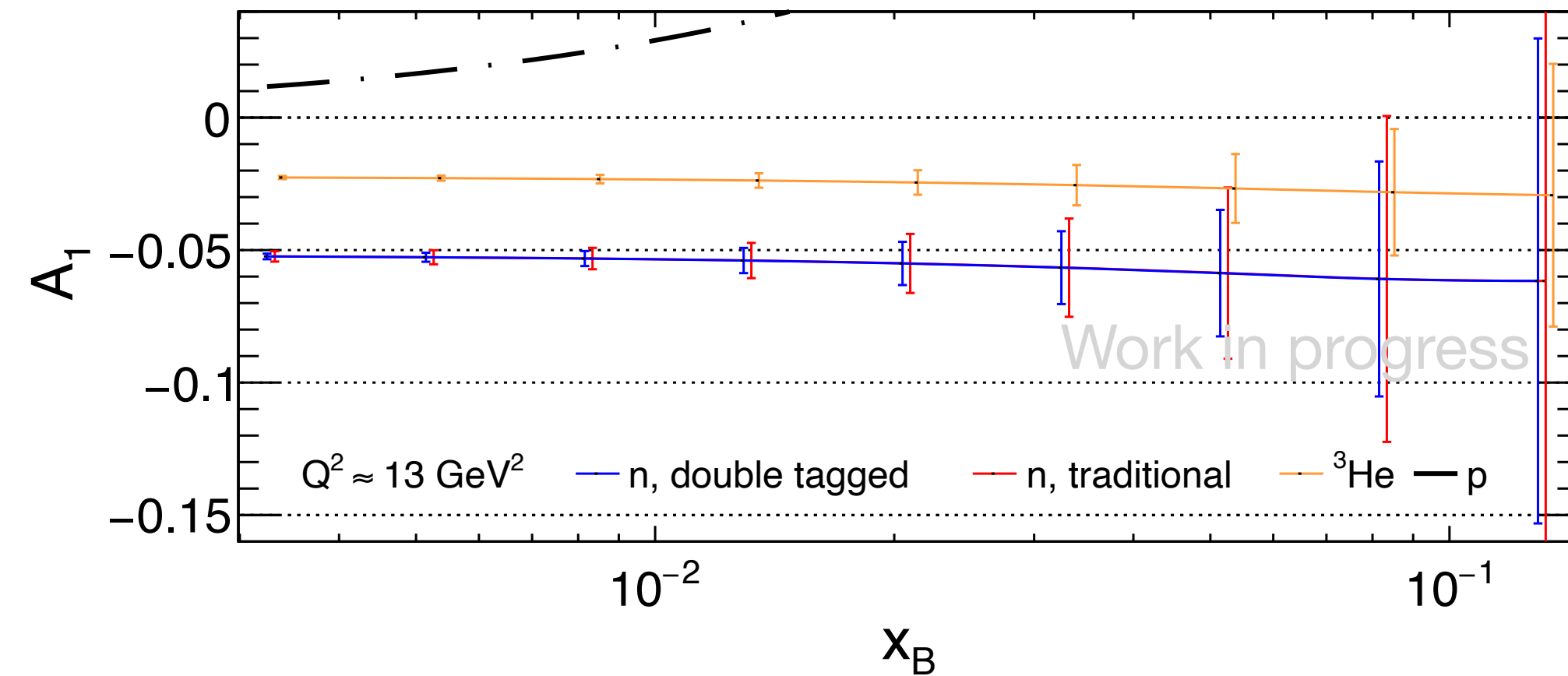
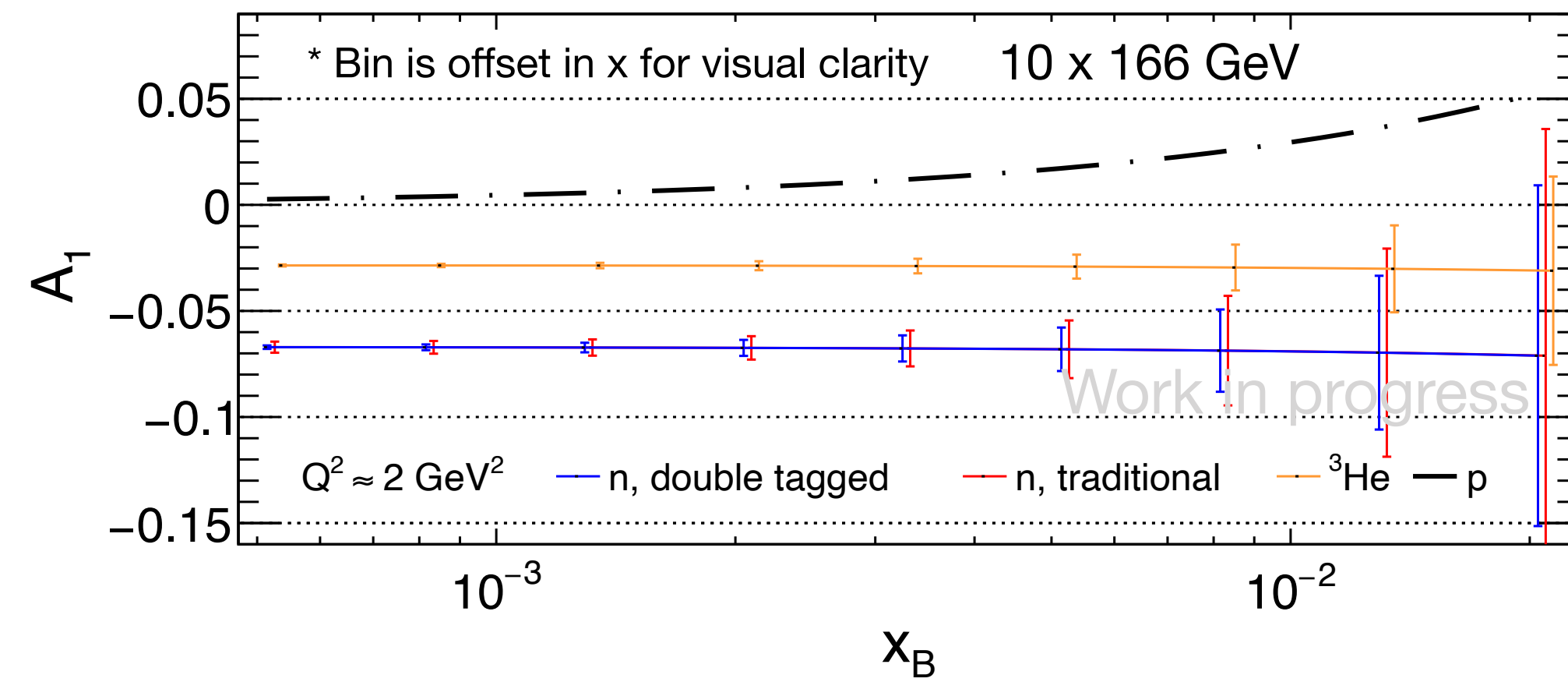
$$A_1^{^3\text{He}} = P_n \frac{F_2^n}{F_2^{^3\text{He}}} A_1^n + 2P_p \frac{F_2^p}{F_2^{^3\text{He}}} A_1^p$$

Was using $F_2^{^3\text{He}}$ per nucleon

Bin A_1^n calculated from: [Doi: 10.2172/824895](https://doi.org/10.2172/824895)

All F_2 's are taken from [JAM22](#)

Correction not yet applied



A_1^n from $e^3\text{He}$ DIS (updated):

$$A_1(x, Q^2) \equiv \frac{\sigma_{1/2} - \sigma_{3/2}}{\sigma_{1/2} + \sigma_{3/2}} = \frac{A_{\parallel}}{D(1 + \eta\xi)} - \frac{\eta A_{\perp}}{d(1 + \eta\xi)}$$

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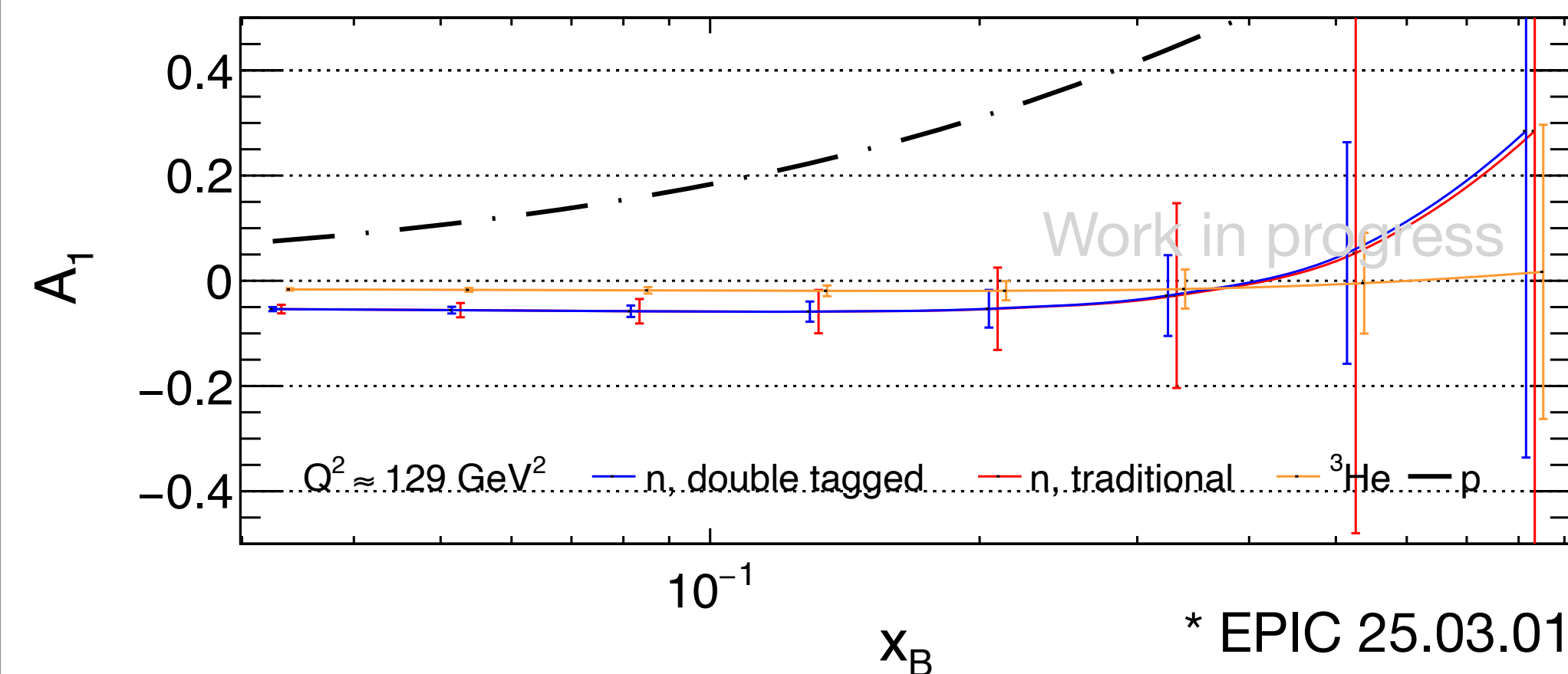
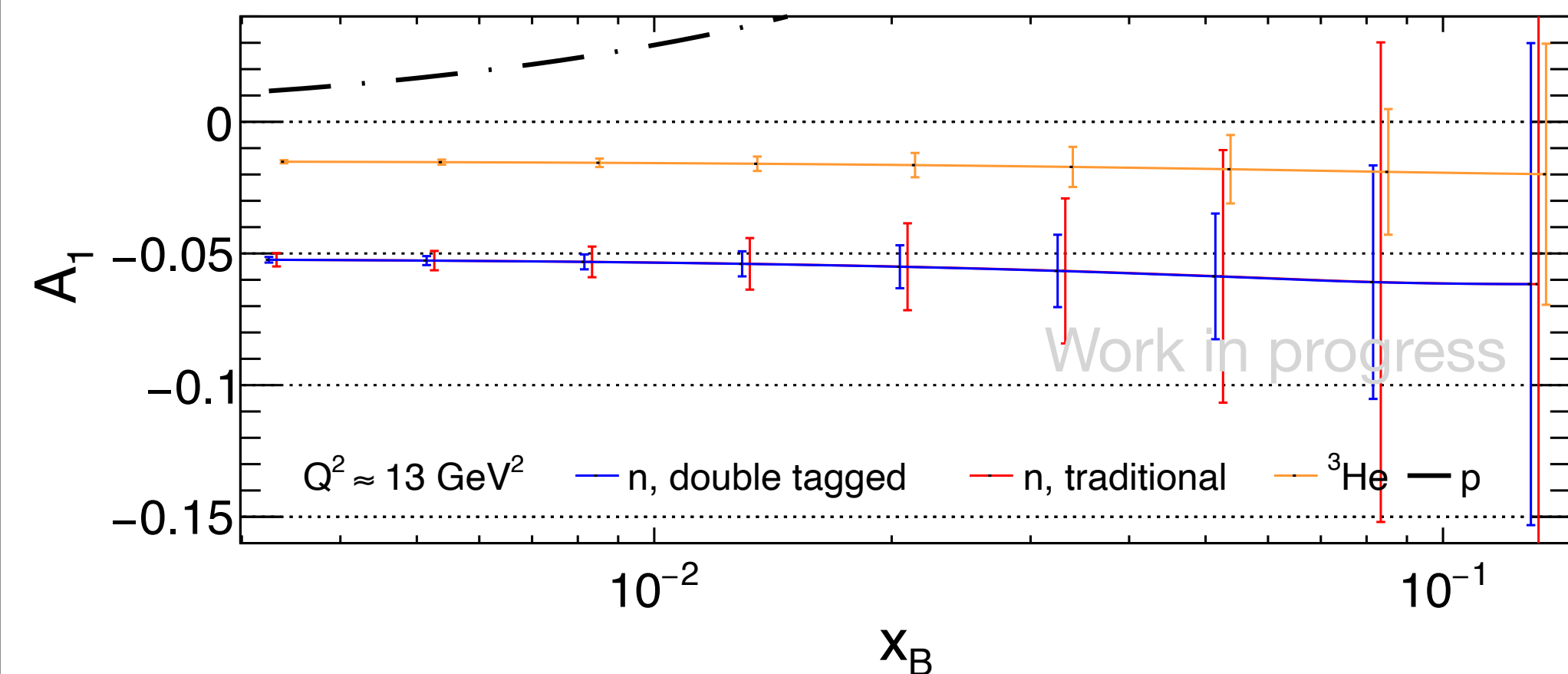
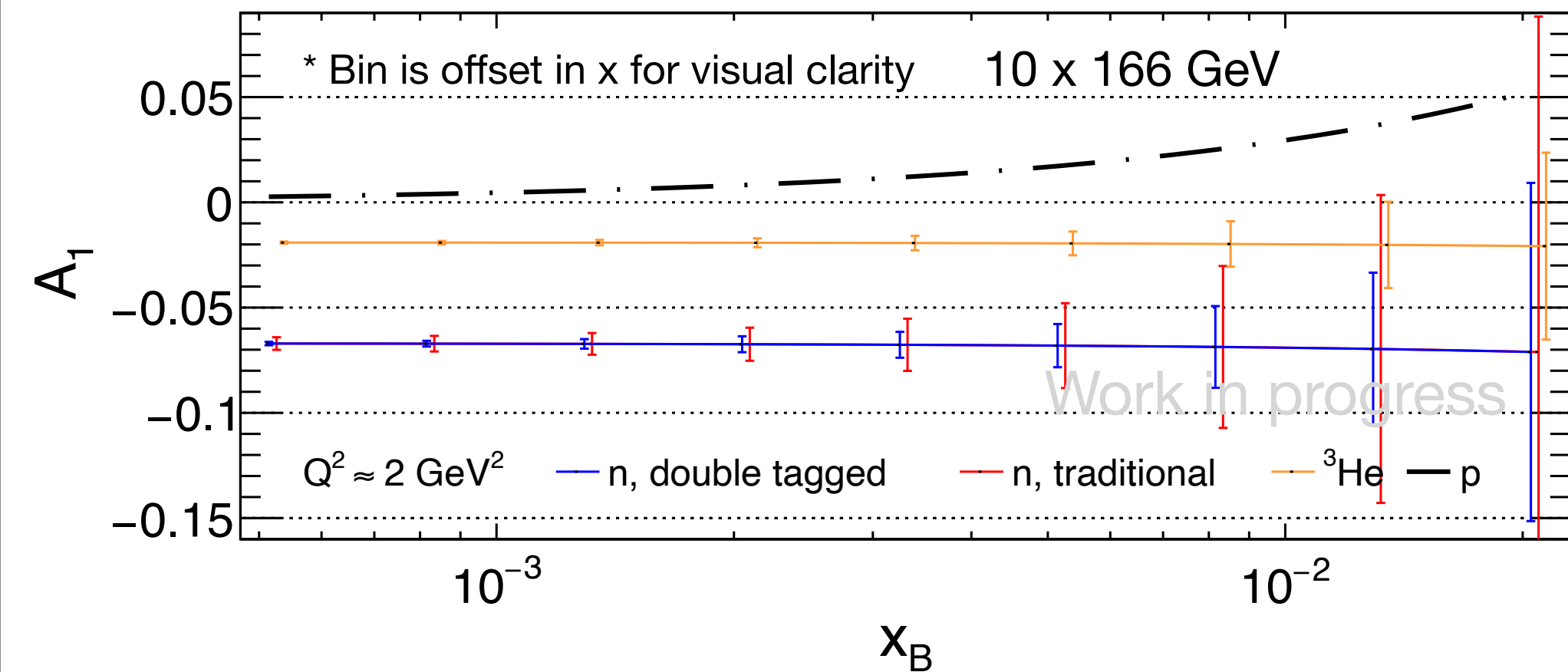
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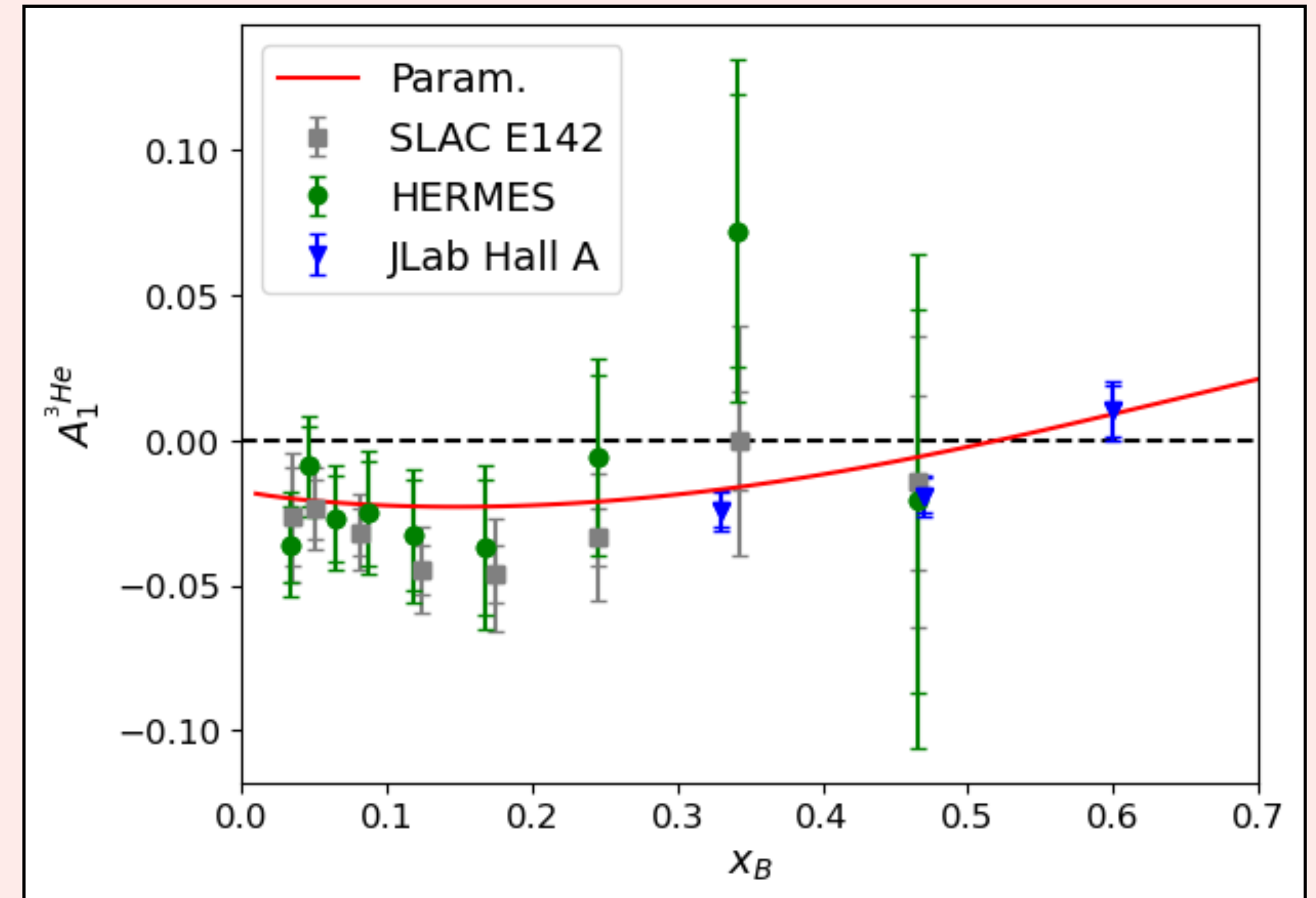
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SLAC E142: <https://doi.org/10.1103/PhysRevD.54.6620>

HERMES: [https://doi.org/10.1016/S0370-2693\(99\)00964-8](https://doi.org/10.1016/S0370-2693(99)00964-8)

JLab Hall A: <https://doi.org/10.1103/PhysRevC.70.065207>