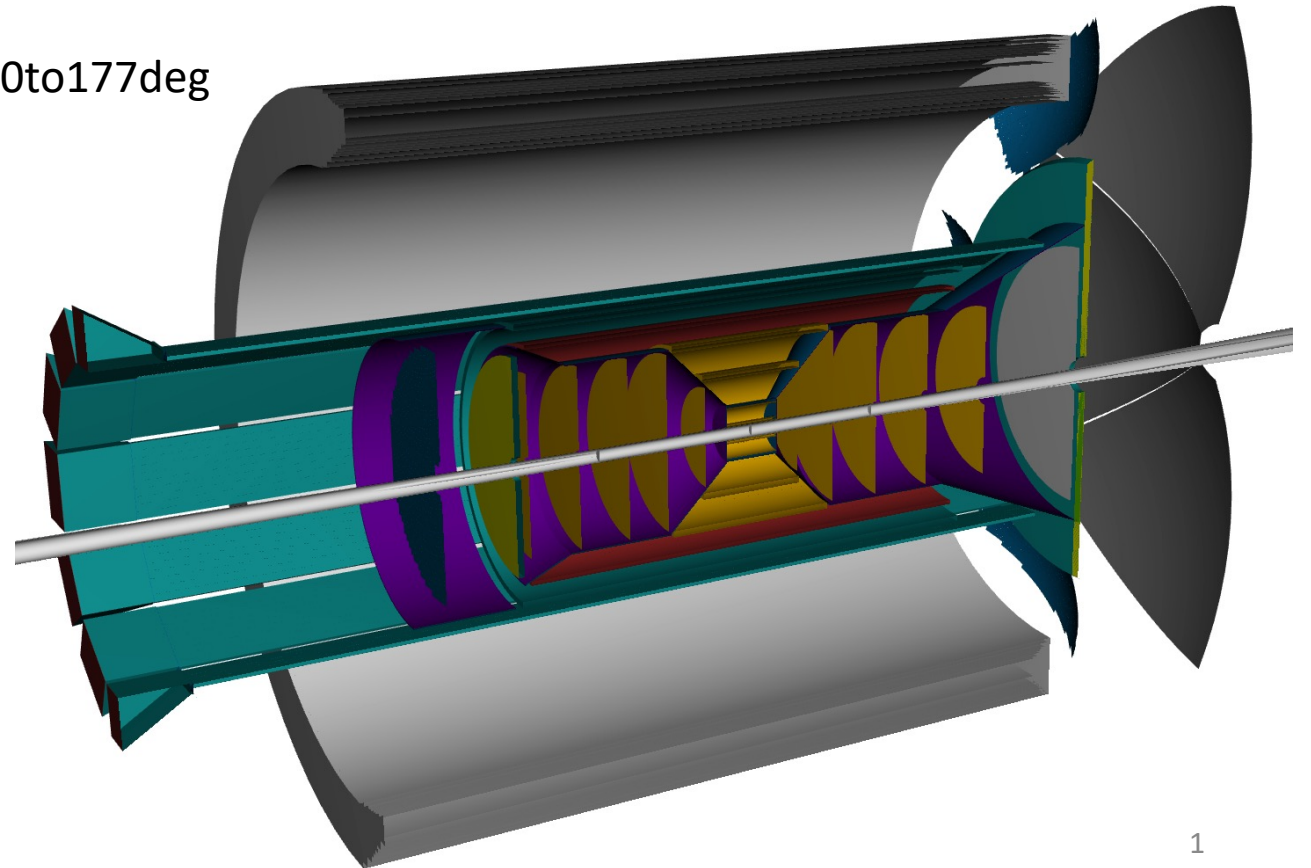


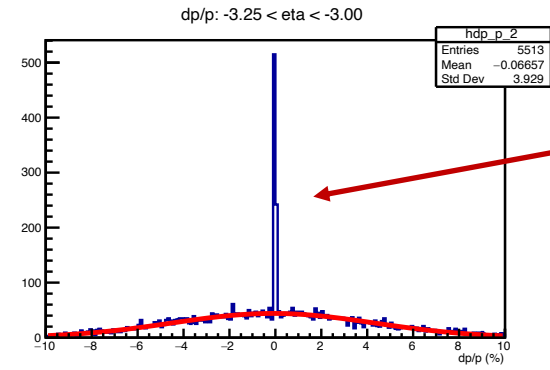
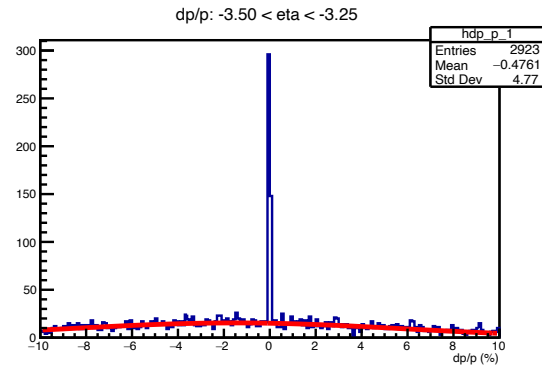
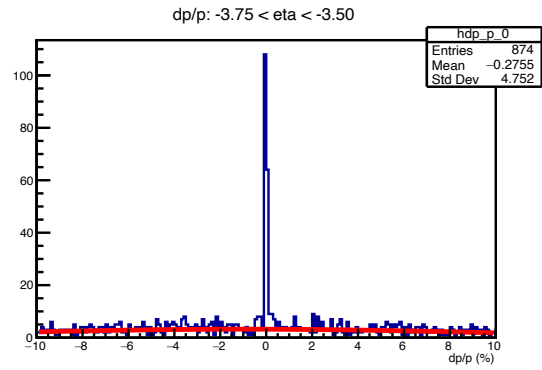
Detector Configuration and Data Set

- From official October Simulation Campaign
- Detector configuration: Bryce Canyon
- S3 locations: eictest/EPIC/RECO/
 - 22.11.2: [22.11.2/epic_brycecanyon/SINGLE/pi-/xx/130to177deg](#)
 - Produced in November 2022
 - Main: [/main/epic_brycecanyon/SINGLE/pi-/xx/130to177deg](#)
 - Produced December 2022

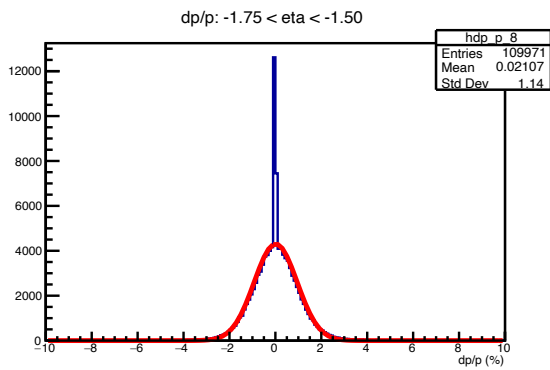
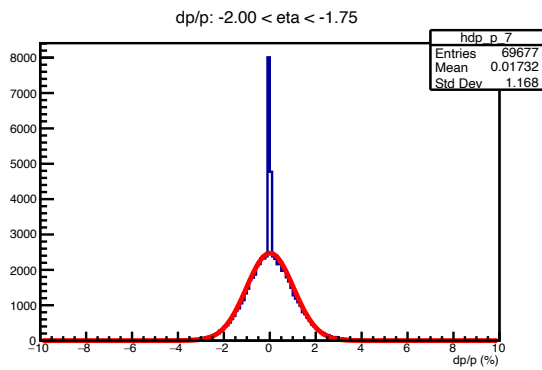
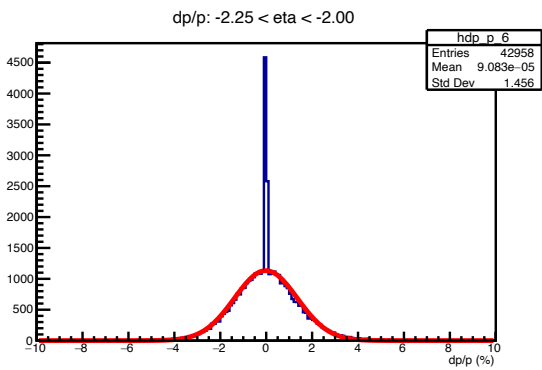
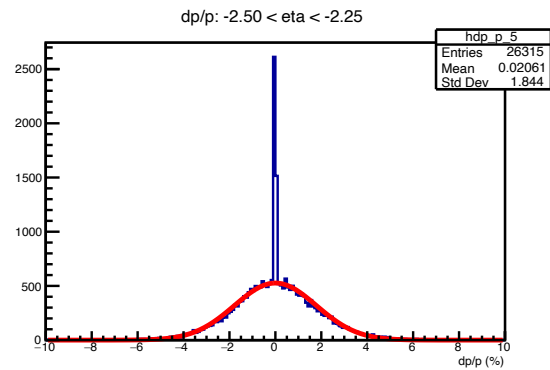
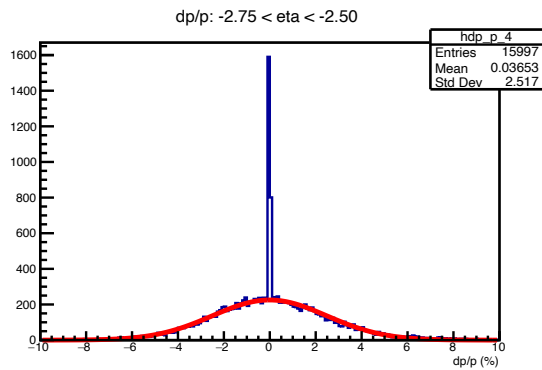
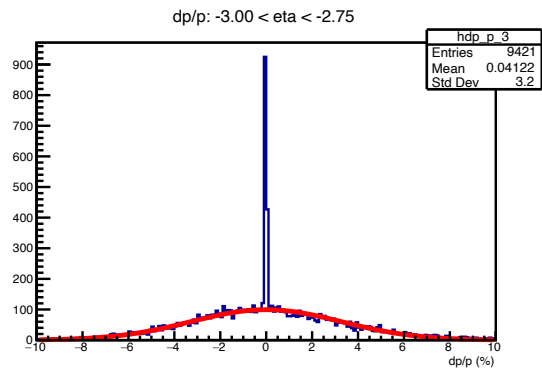
- Tracking parameterization done with pi-
 - fixed momenta of:
0.2, 0.5, 1, 2, 5, 10, 20 GeV/c
 - η range: [-3.75, -1.5]
 - η bin width = 0.25



$\Delta p/p$ Fits: 22.11.2

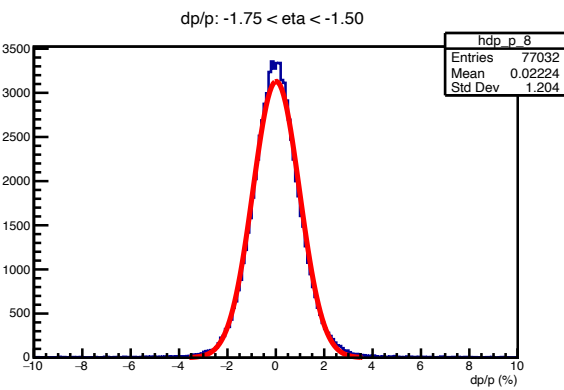
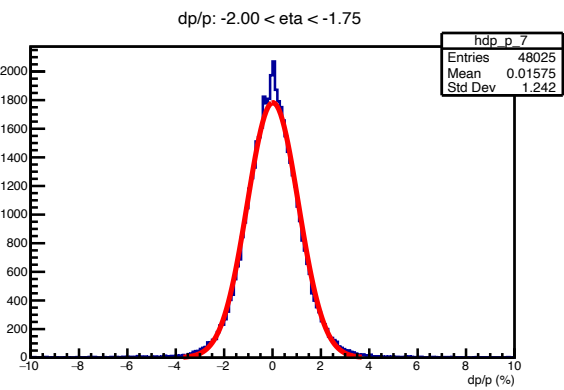
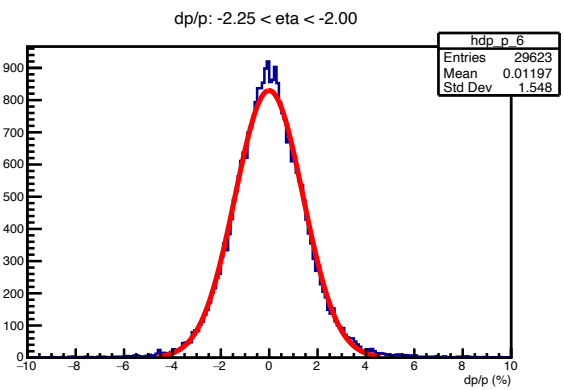
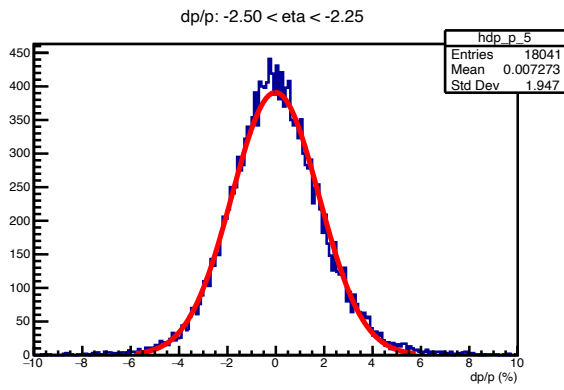
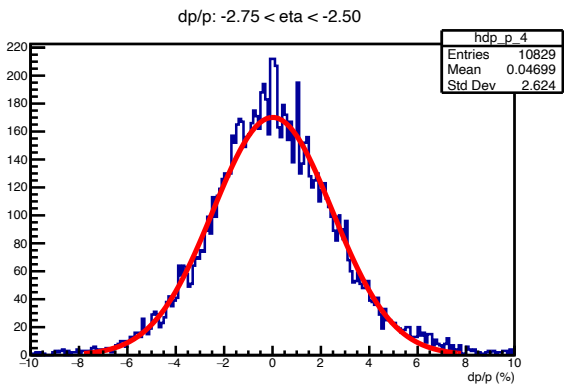
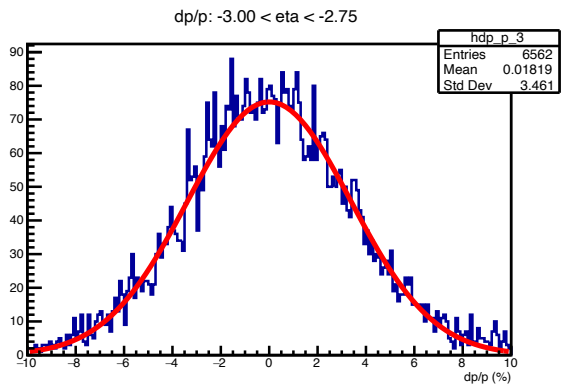
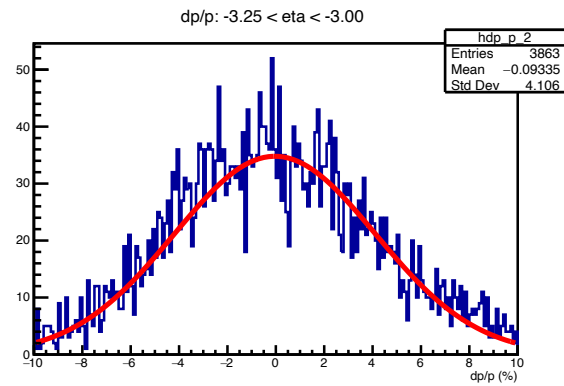
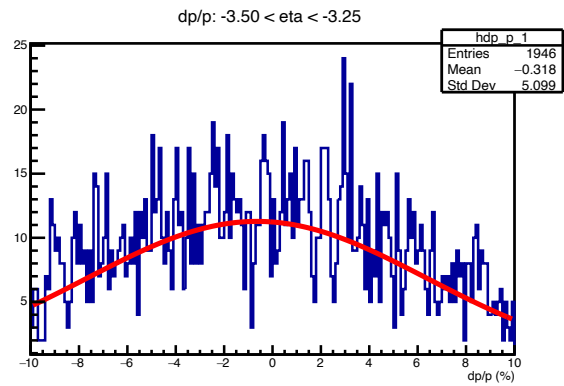
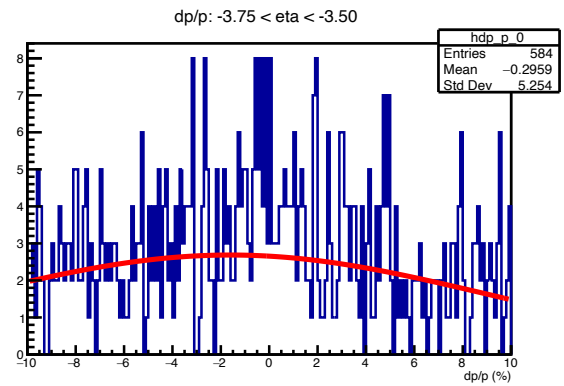


Large peak at 0?

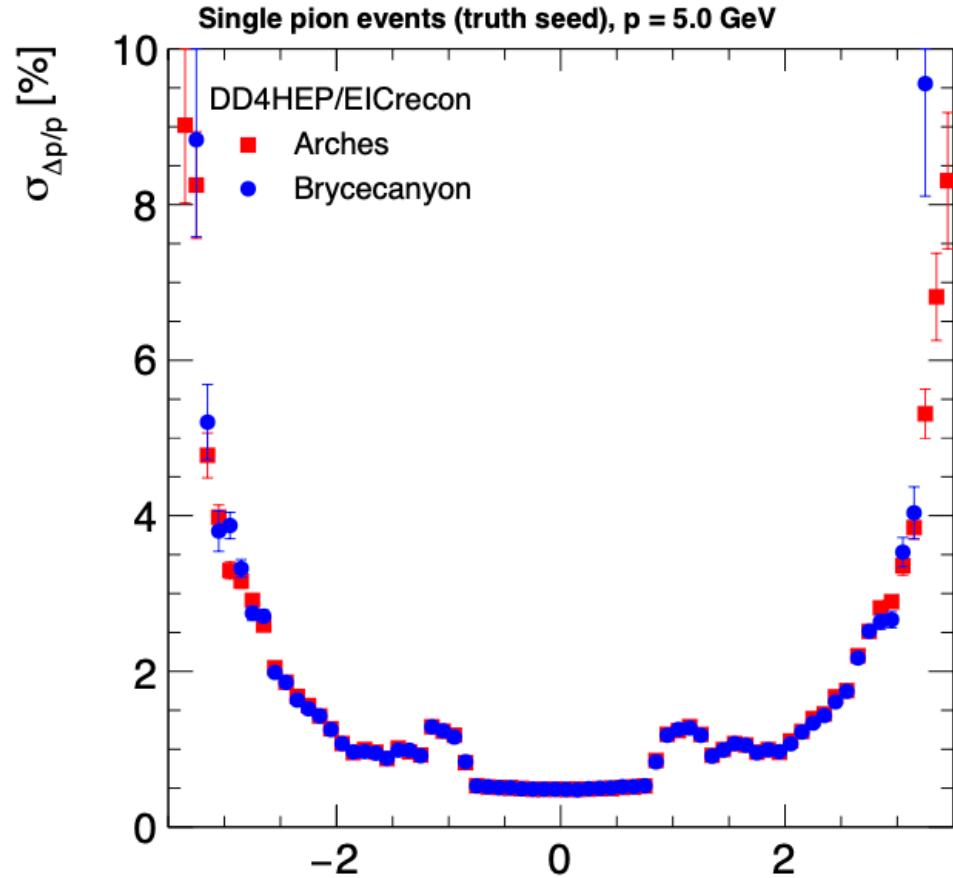


$\Delta p/p$ Fits: main

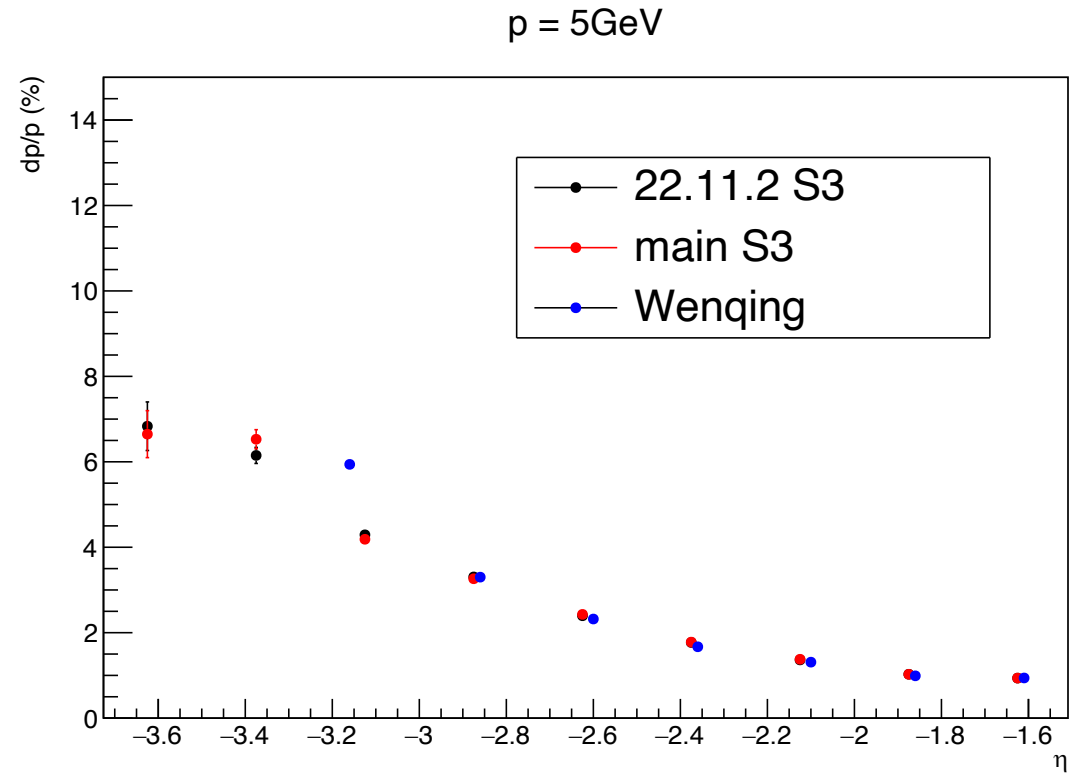
No large peak at 0



Consistency Check: 5 GeV



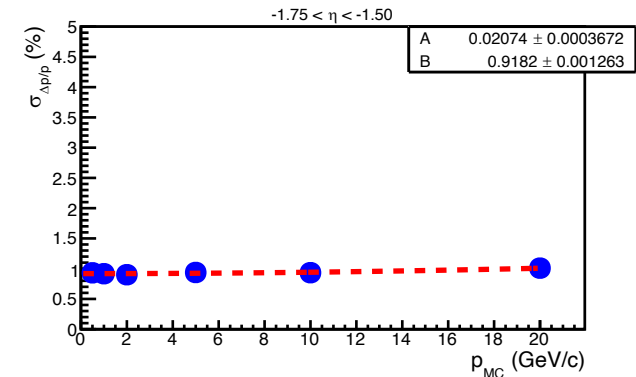
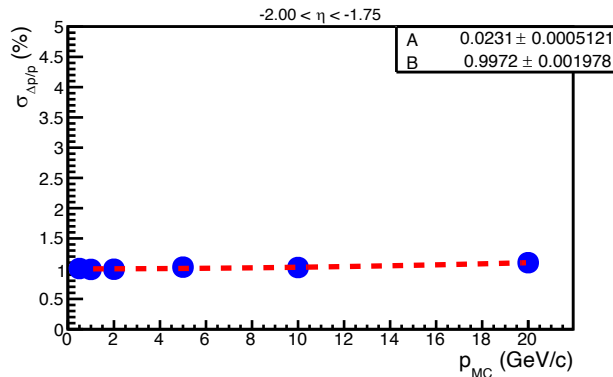
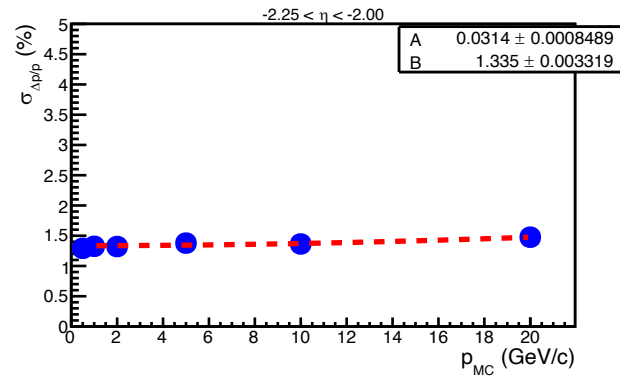
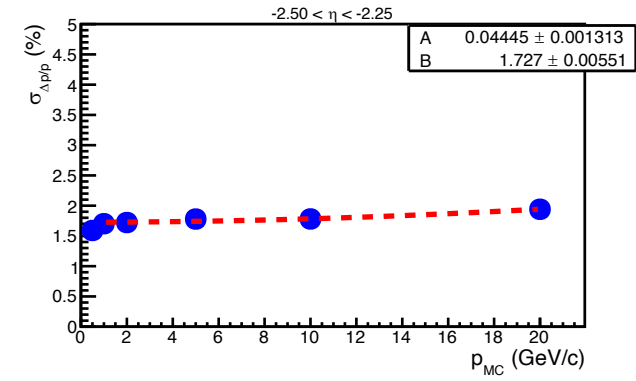
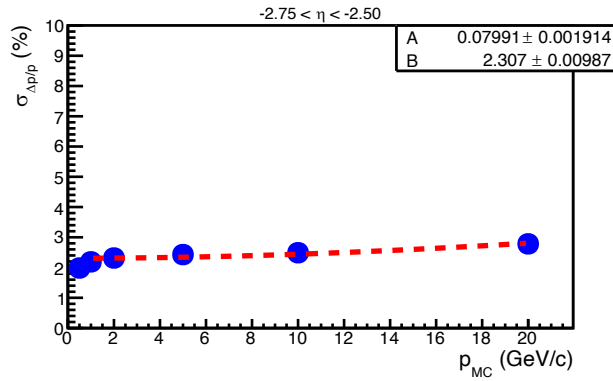
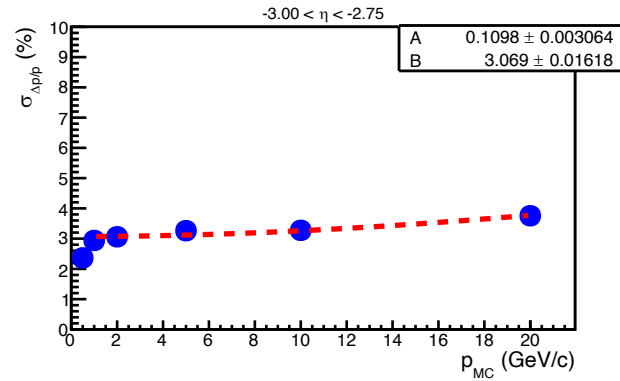
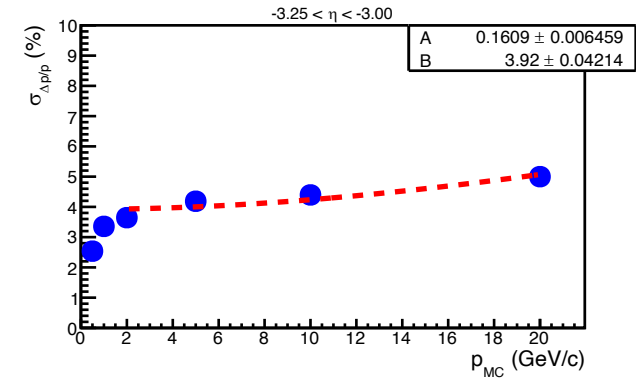
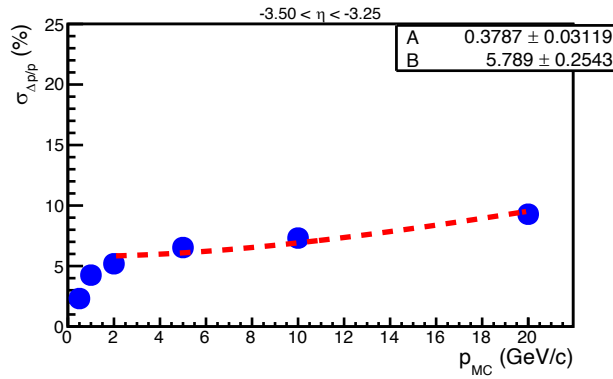
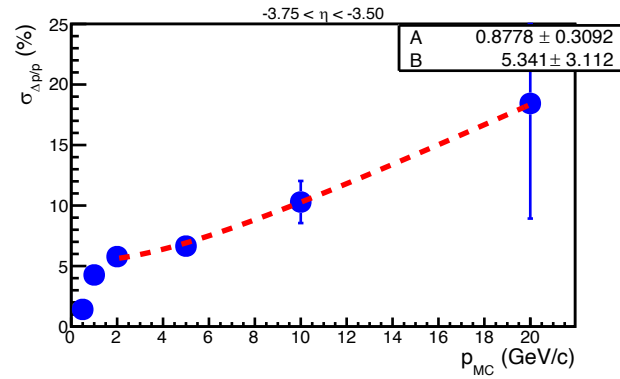
[Wenqing: ePIC Tracking WG 12/08/22](#)



22.11.2 and main productions are consistent with what Wenqing presented

Checks at 1 and 10 GeV/s show similar consistency

$$F(p) = \sqrt{(A \cdot p)^2 + B^2}$$

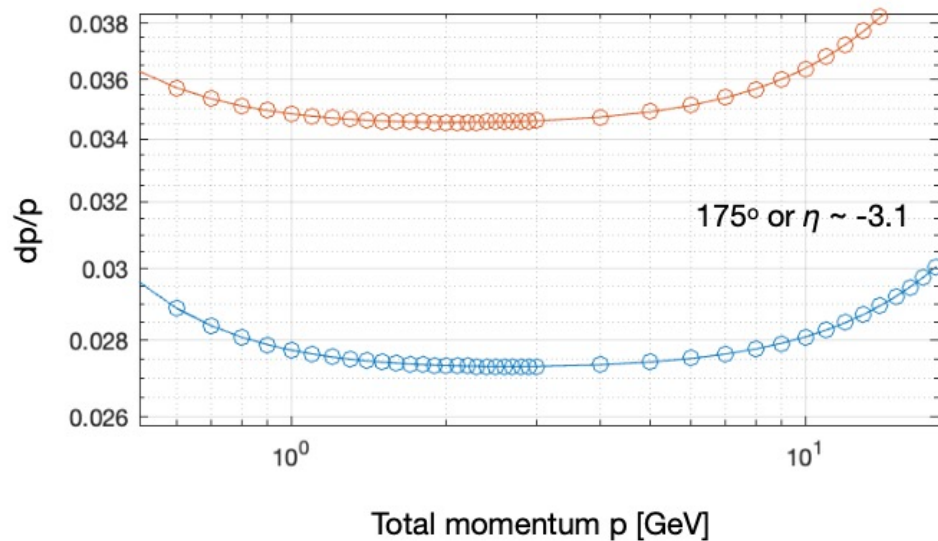


Tracking Lever Arm Impact

➤ Studied in fast simulations

- Red: geometry used in Arches and Bryce Canyon
- Blue: Prior geometry
 - $|z| = 25, 45, 70, 100, 135$ cm

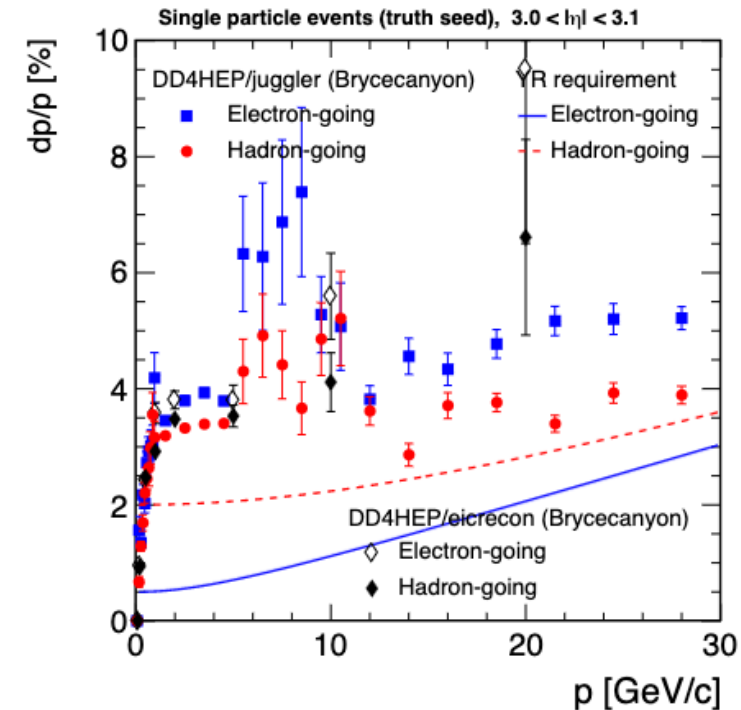
Ernst Sichtermann: [ePIC Tracking WG \(10/13/22\)](#)



➤ Forward/Backward official comparison

- Official simulation (Tag 22.11.2)
- Tracking arm
 - 115 cm in electron direction
 - 135 cm in hadron direction

Wenqing Fang: [ePIC Tracking WG \(12/01/22\)](#)



Additional Slides

Central Simulation Comparisons

Configurations Simulated

- Two configurations simulated as part of October 2022 ePIC central simulations
 - Arches
 - Bryce Canyon

Arches

- Barrel:
 - MPGD layer behind DIRC (not used in track reconstruction)
 - Si-Glass EM Cal
- Backward: mRICH

Bryce Canyon

- Barrel: Imaging EM Cal
- Backward: pfRICH

Geometry Comparisons

ePIC October Simulation Campaign

- Arches → mRICH
- Bryce Canyon → pfRICH
- Tracking setup
 - Same Si disk setup for Arches and Bryce Canyon
 - Only tracking difference was MPGD layer behind hpDIRC (implemented in Arches) which was **not used** in reconstruction

Arches Si Disks (cm)	Bryce Canyon Si Disks (cm)
25	25
45	45
70	70
100	100
135	135
-25	-25
-45	-45
-65	-65
-90	-90
-115	-115

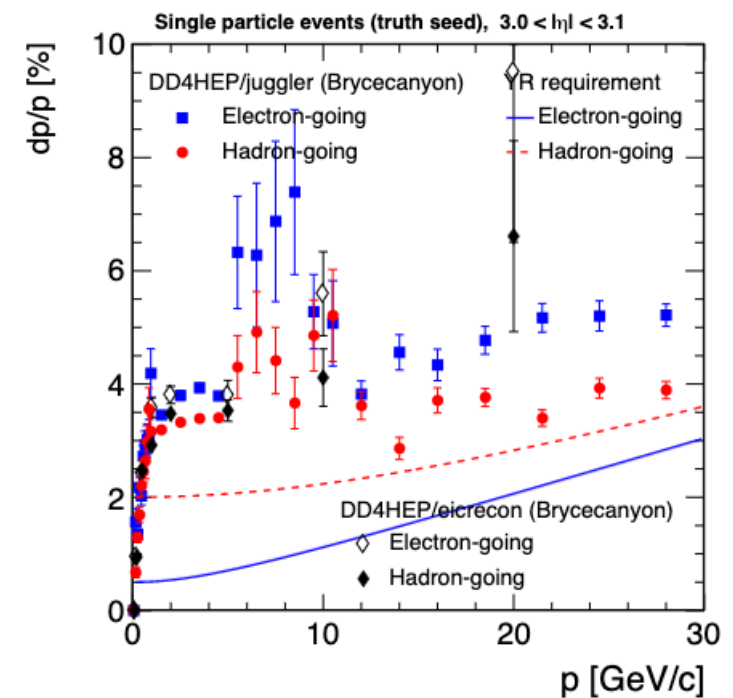
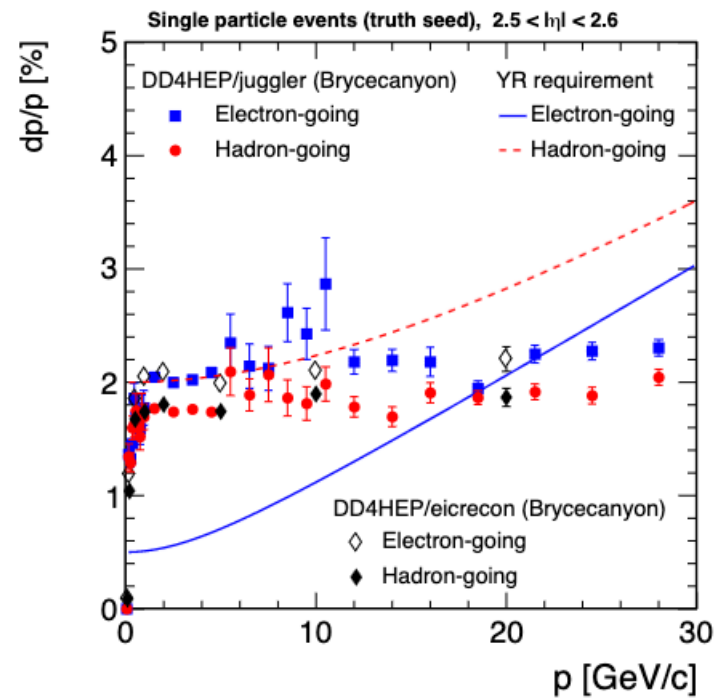
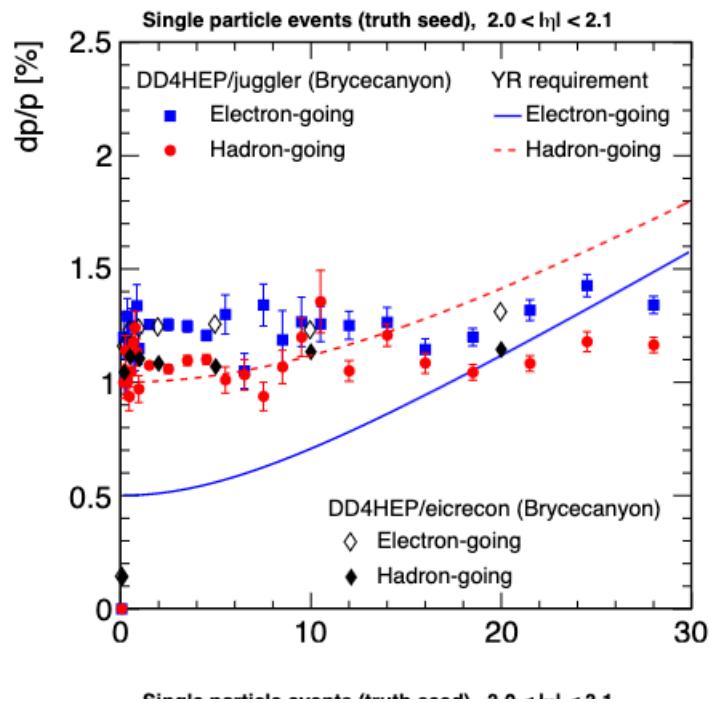
RICH Comparisons

Detector	Z min (cm)	Z max (cm)	Length (cm)	R min (cm)	R max (cm)
mRICH	130	172.7	42.7	8	63
pfRICH	118.6	172.7	54.1	4.6/5.9	63

Tracking Lever Arm Impact

Tracker extends

- 115 cm in electron direction
- 135 cm in hadron direction

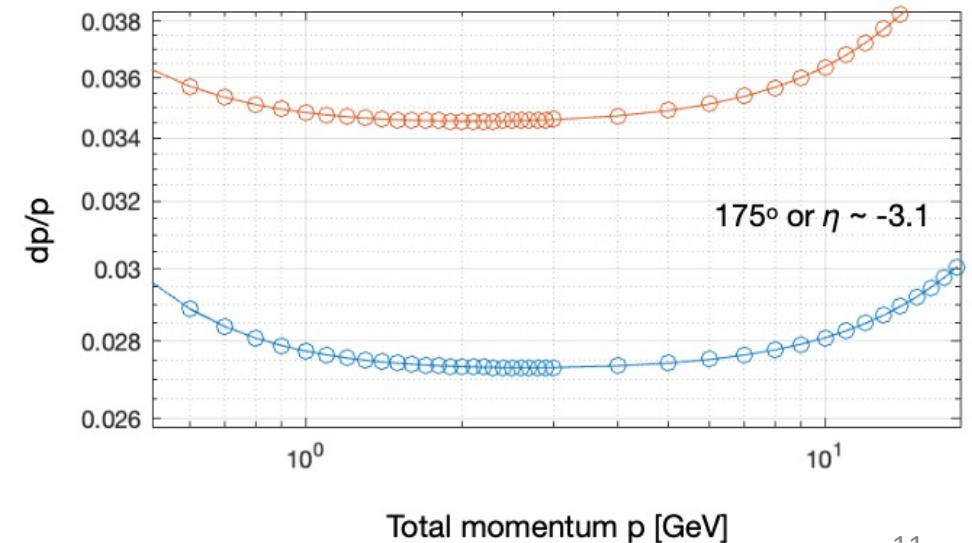
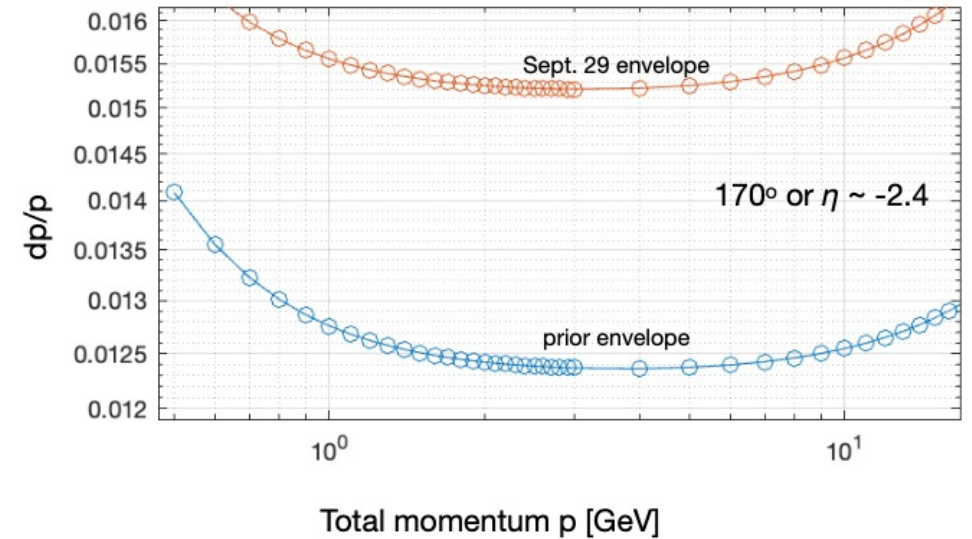


[Wenqing: ePIC Tracking WG Meeting 12/1/22](#)

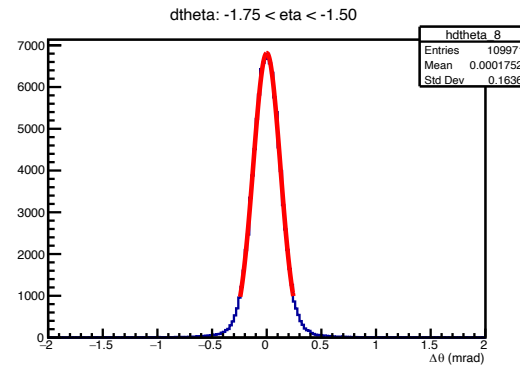
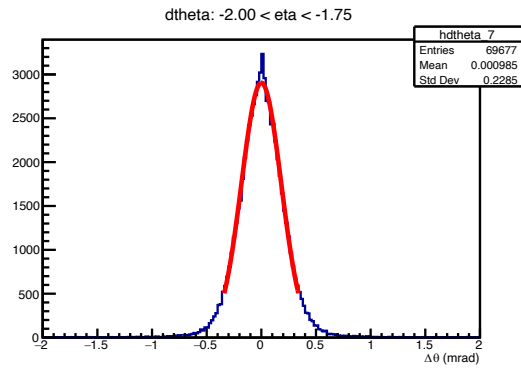
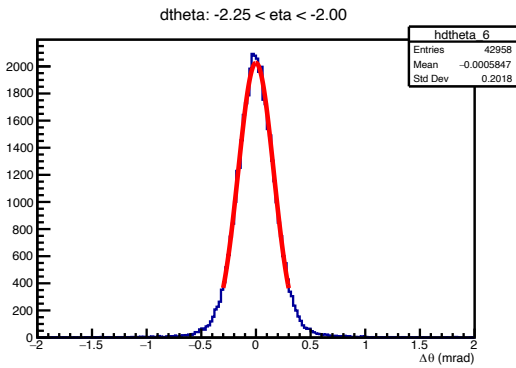
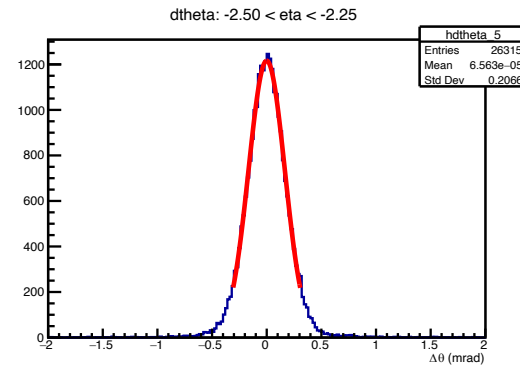
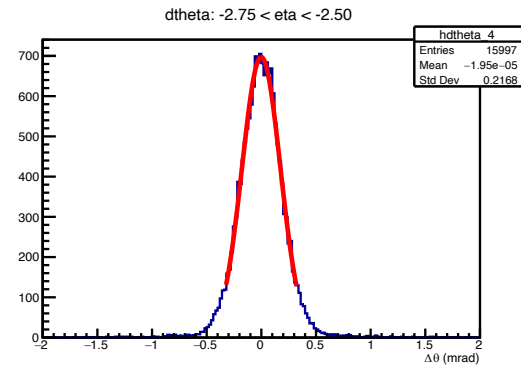
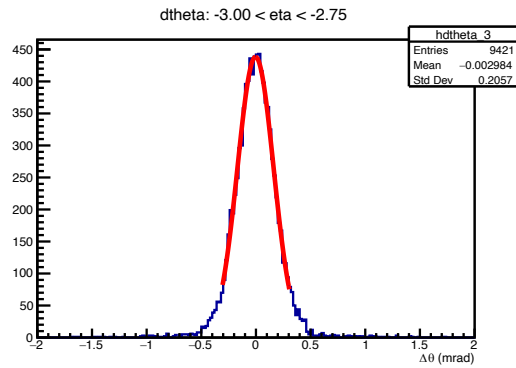
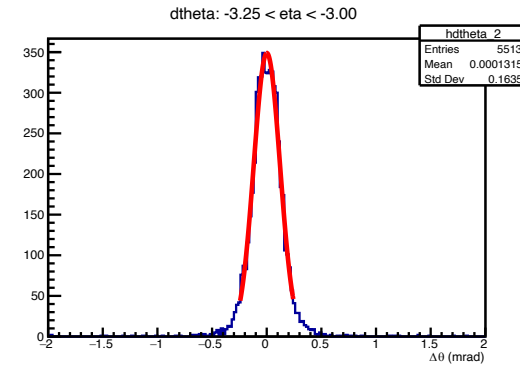
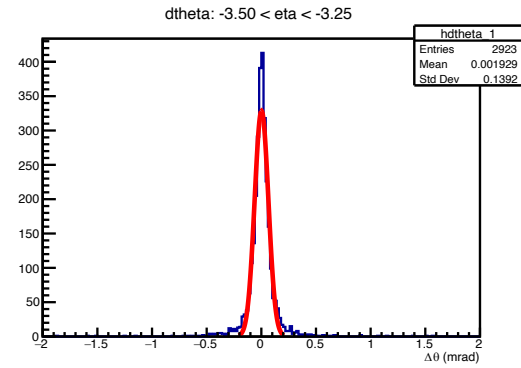
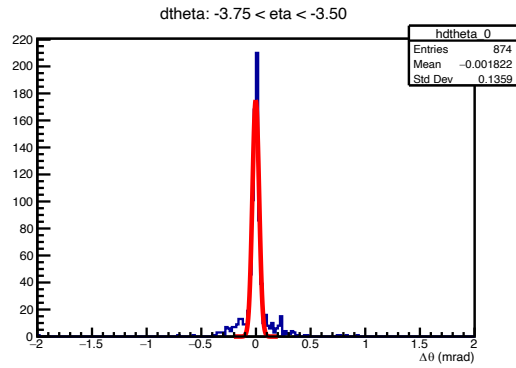
Tracking Lever Arm Impact

- Studied in fast simulations
- **Red**: geometry used in Arches and Bryce Canyon
- **Blue**: Prior geometry
 - $|z| = 25, 45, 70, 100, 135$ cm

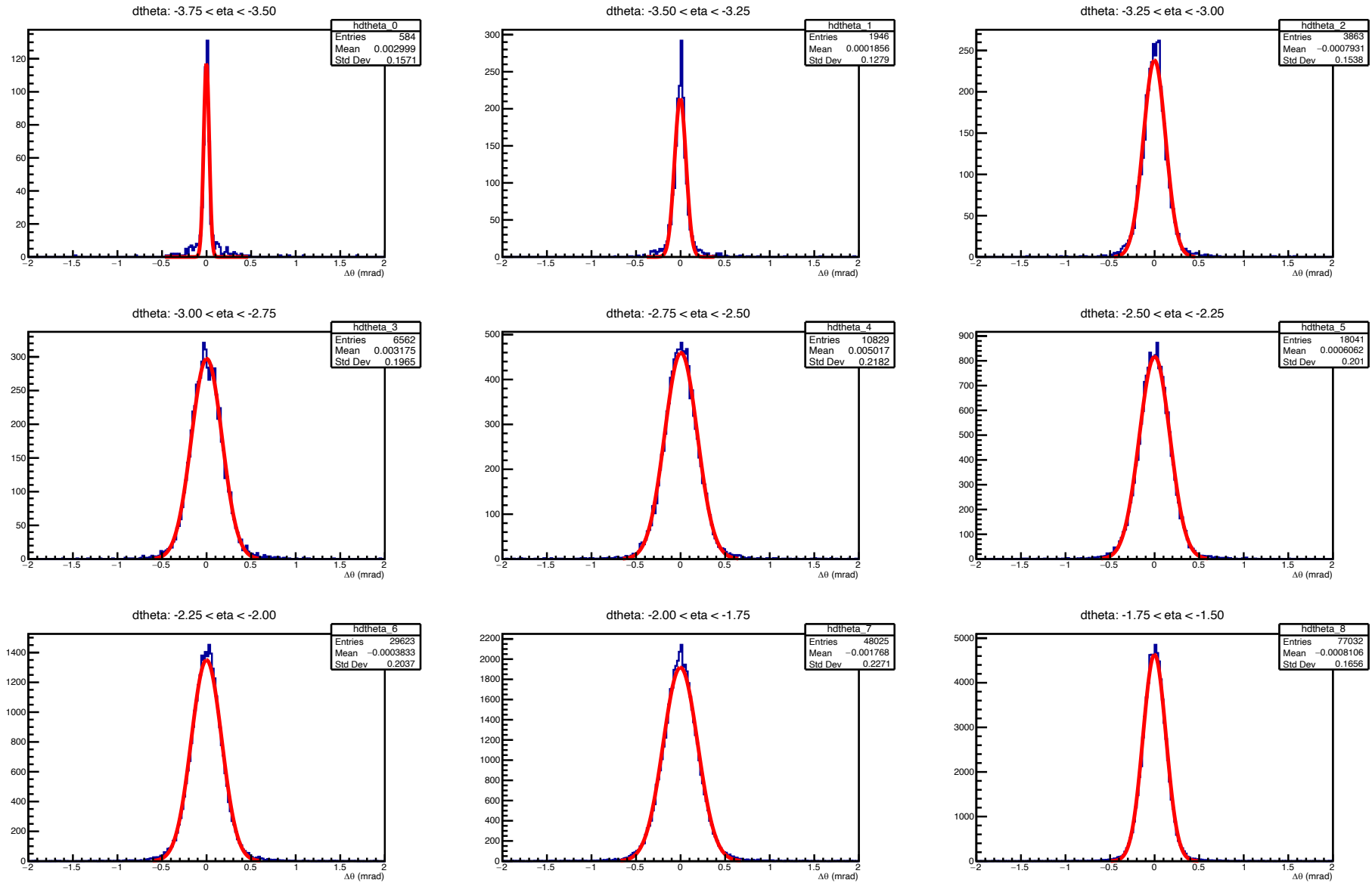
Ernst Sichtermann: [ePIC Tracking WG \(10/13/22\)](#)



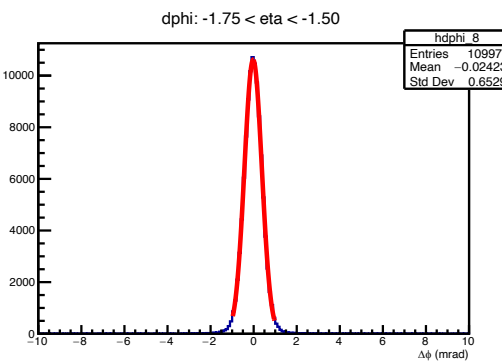
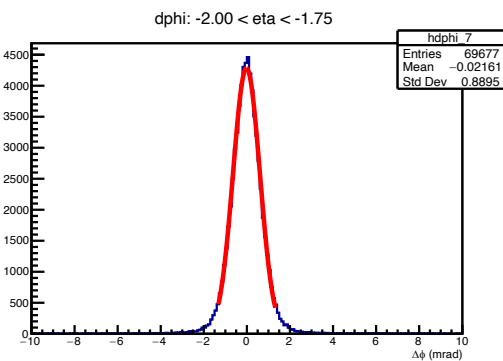
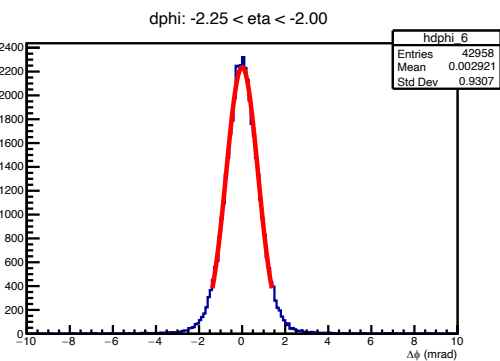
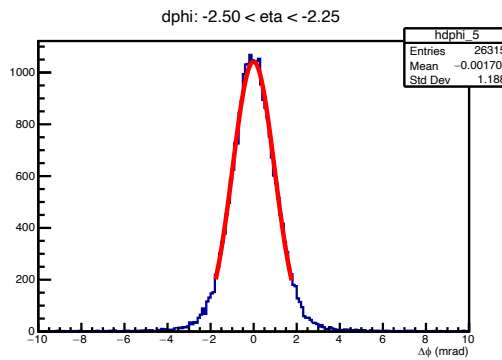
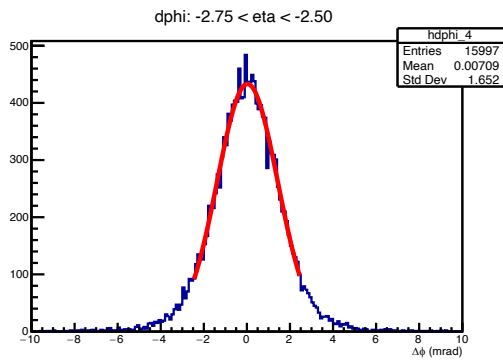
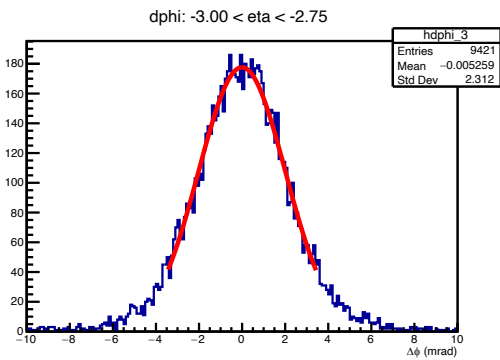
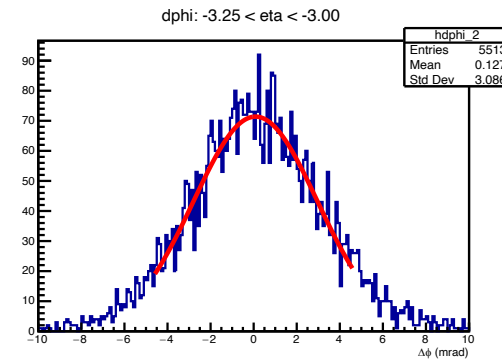
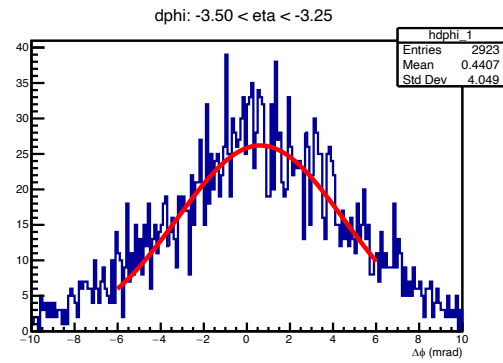
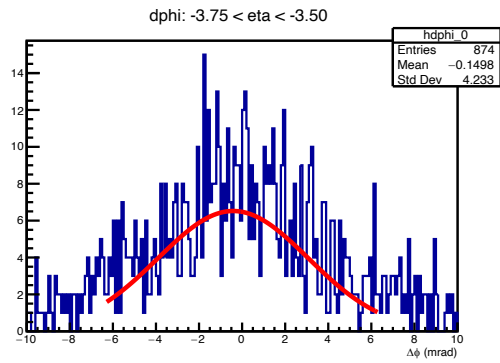
$\Delta\theta$ Fits: 22.11.2 (@vertex)



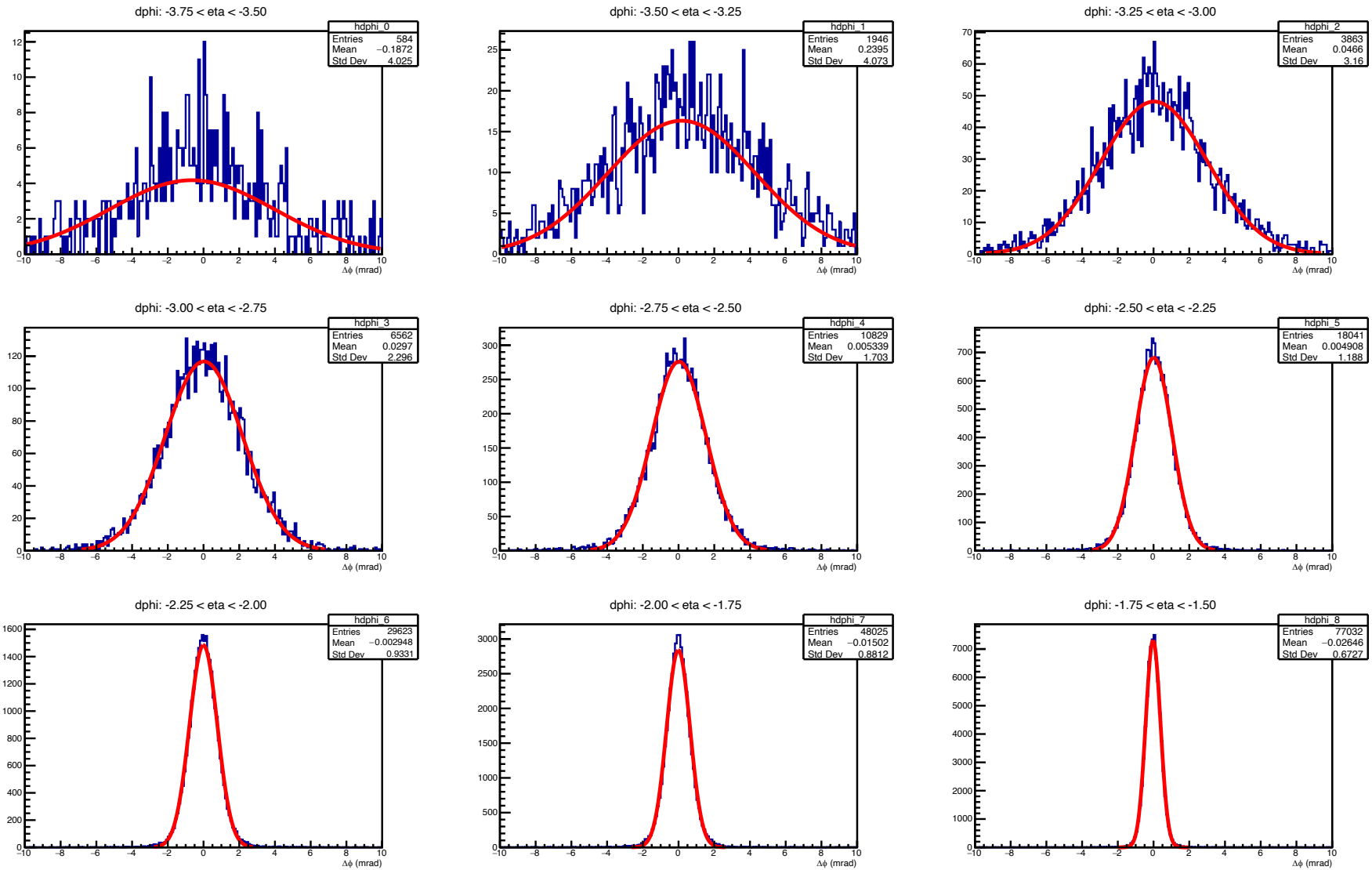
$\Delta\theta$ Fits: main (@vertex)



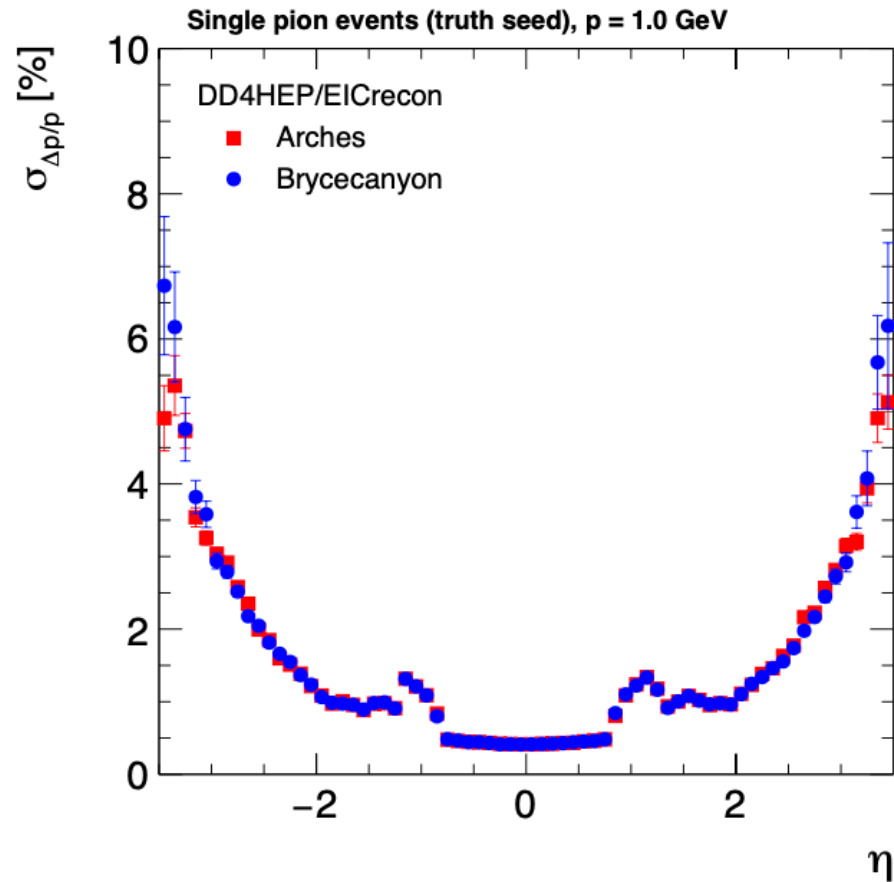
$\Delta\phi$ Fits: 22.11.2 (@vertex)



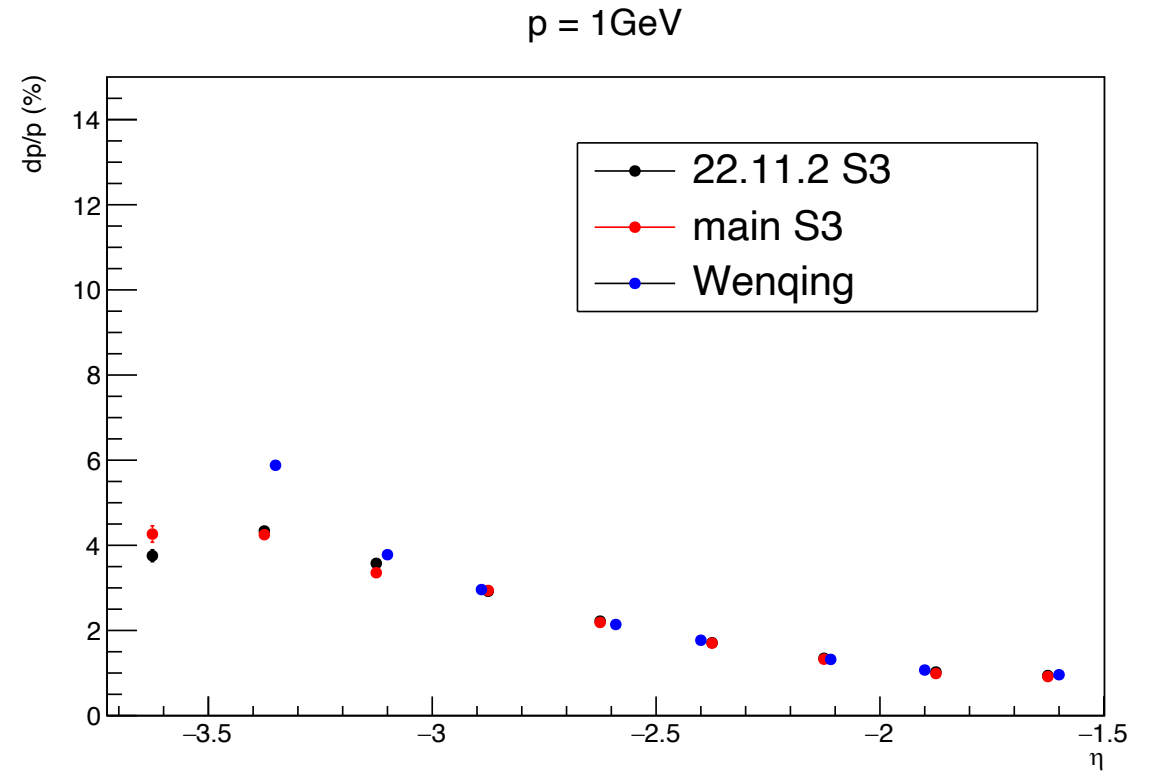
$\Delta\phi$ Fits: main (@vertex)



Consistency Check: $p = 1$ GeV

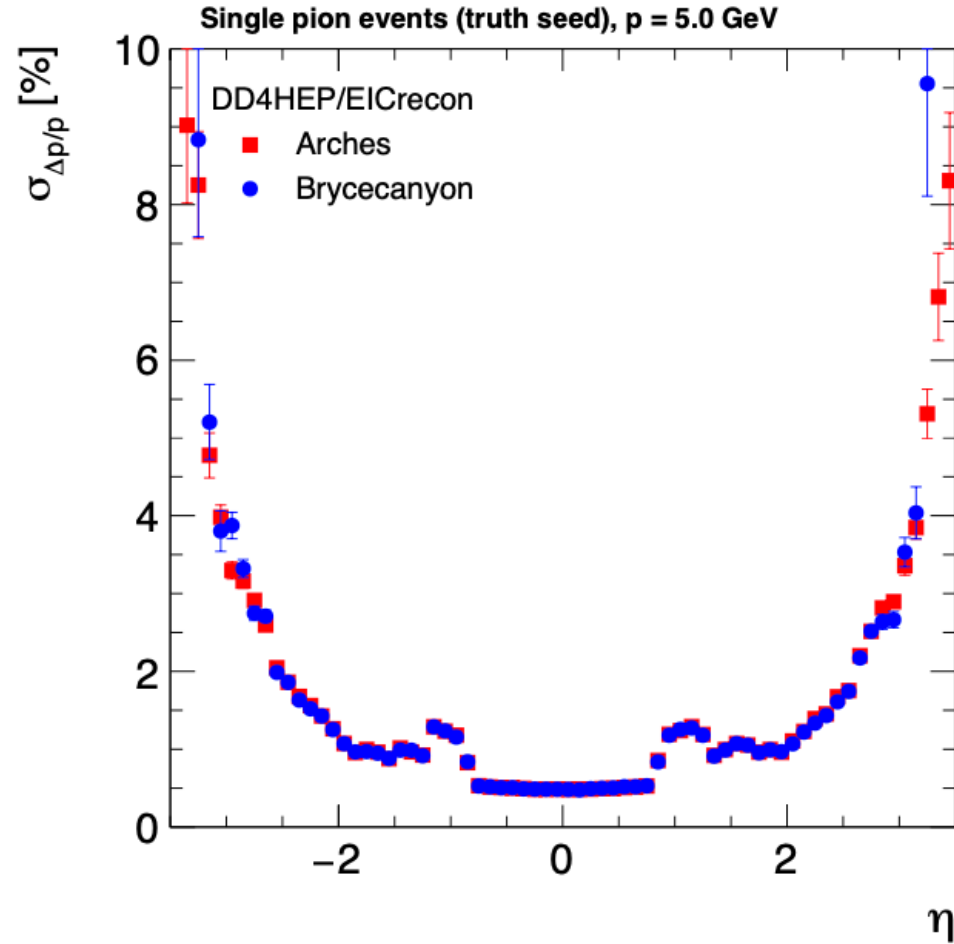


[Wenqing: ePIC Tracking WG 12/08/22](#)

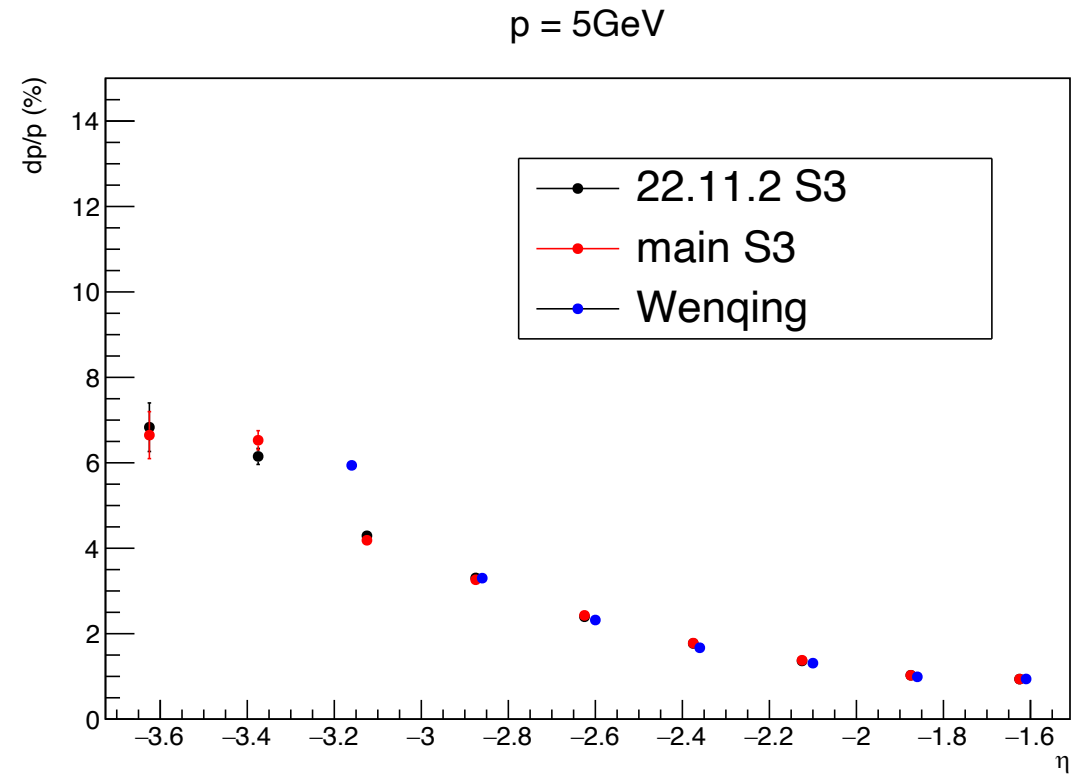


22.11.2 and main productions are consistent with what Wenqing presented

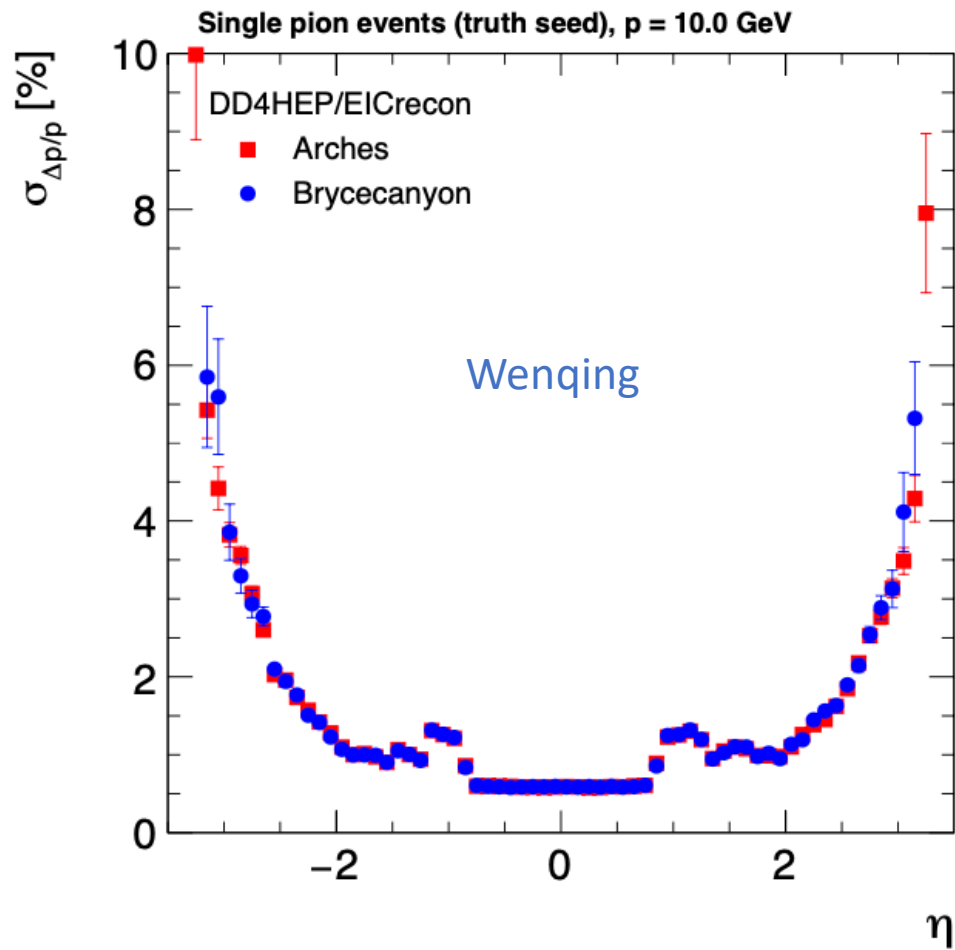
Consistency Check: 5 GeV



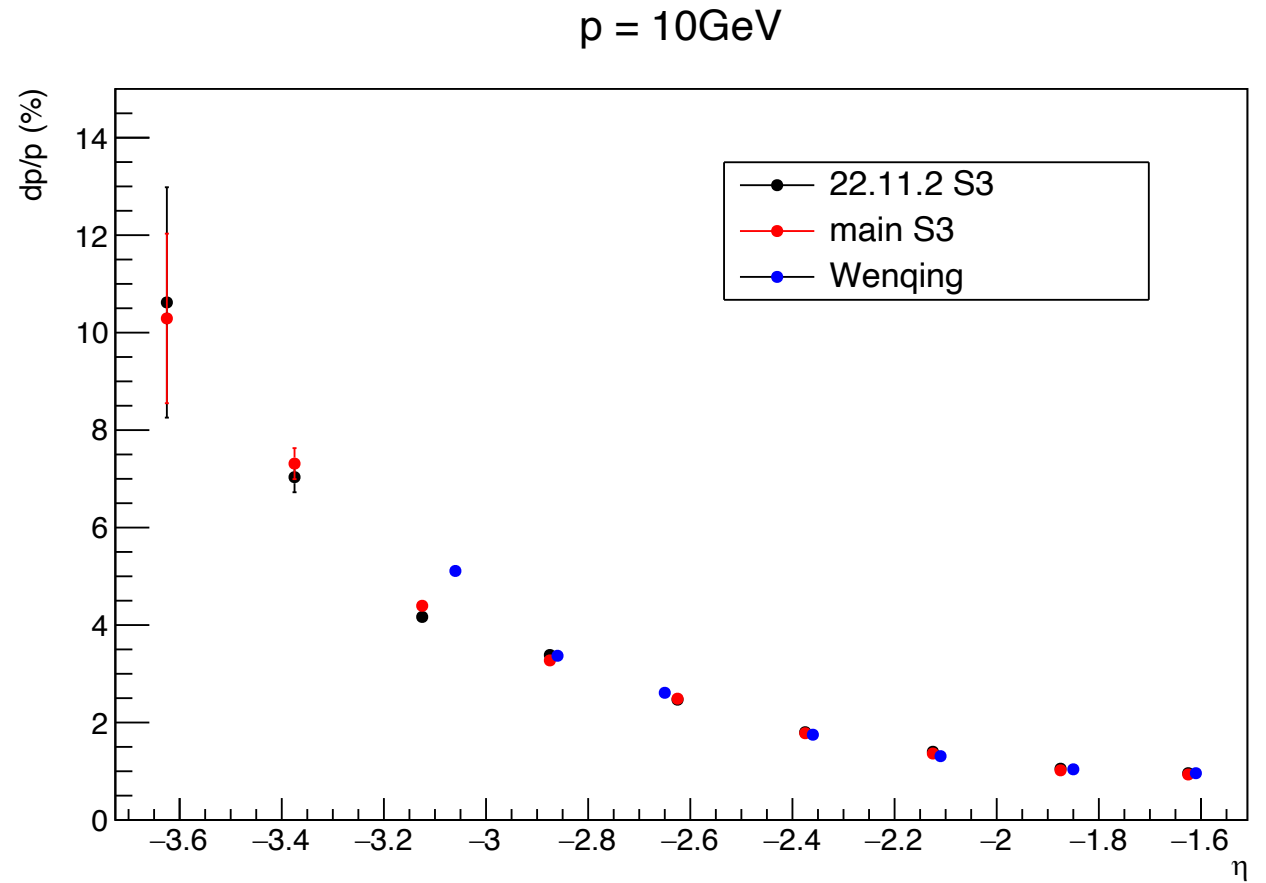
[Wenqing: ePIC Tracking WG 12/08/22](#)



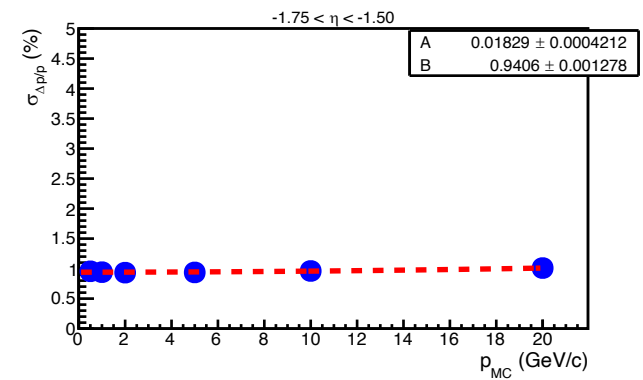
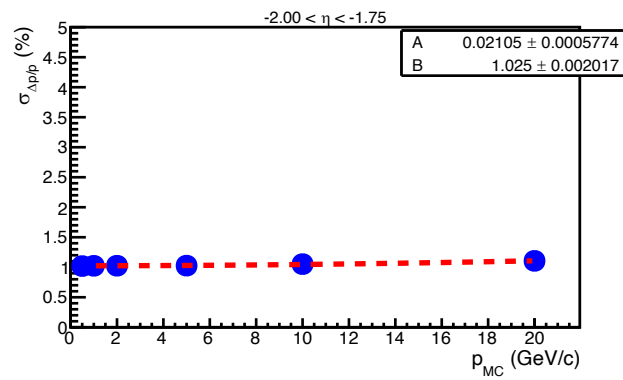
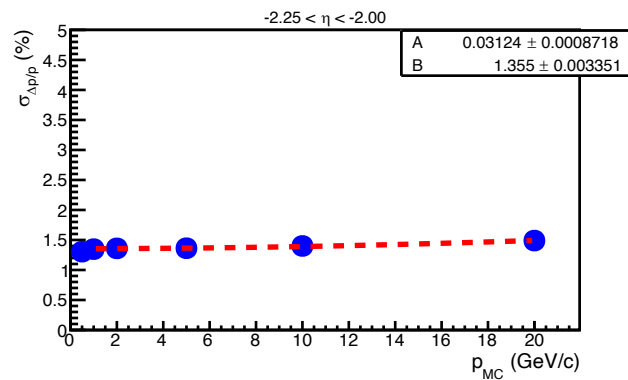
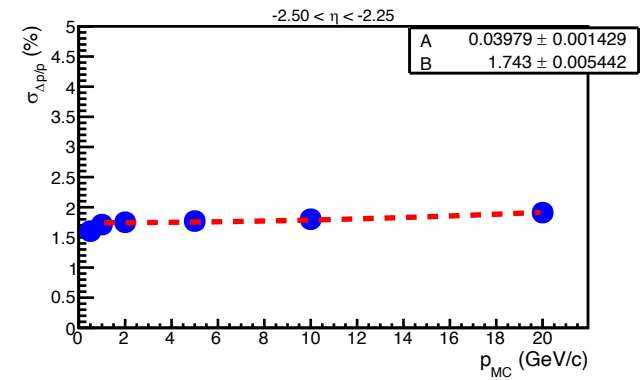
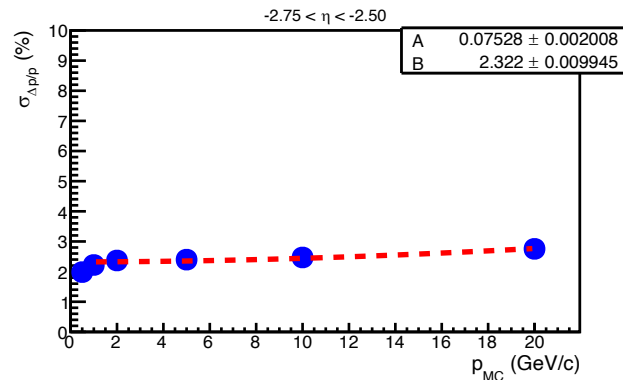
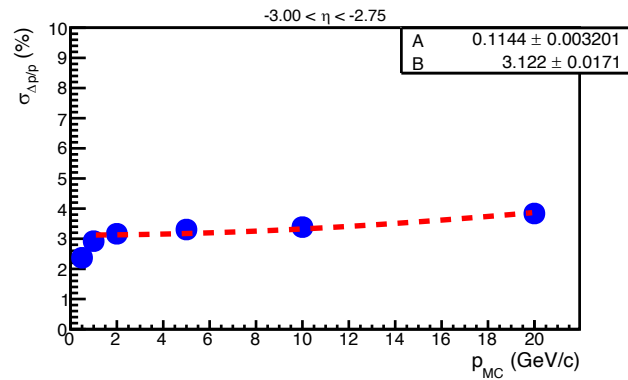
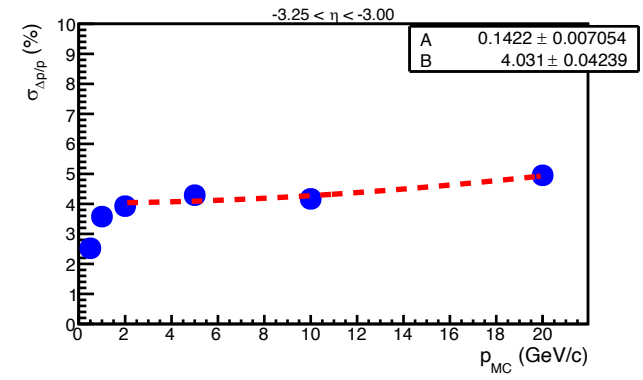
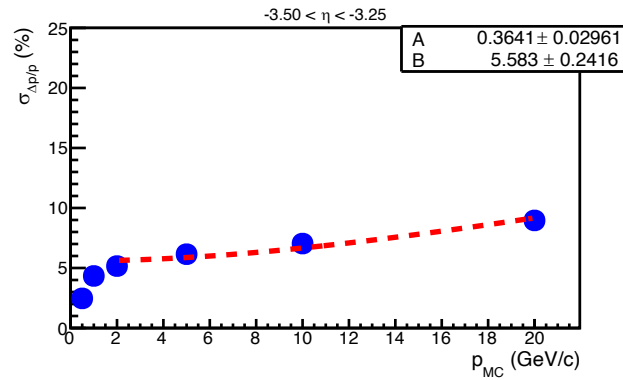
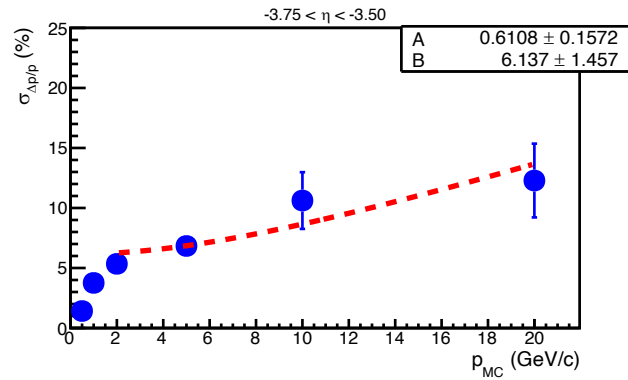
Consistency Check



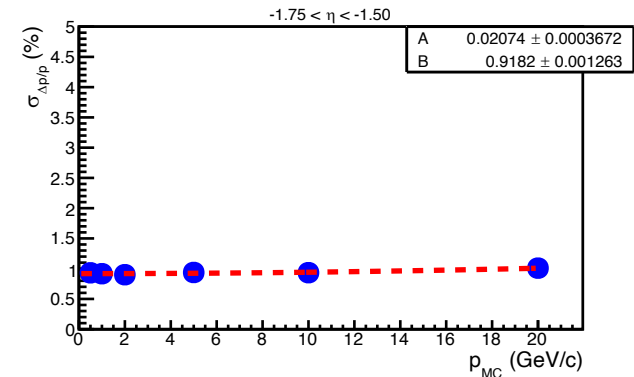
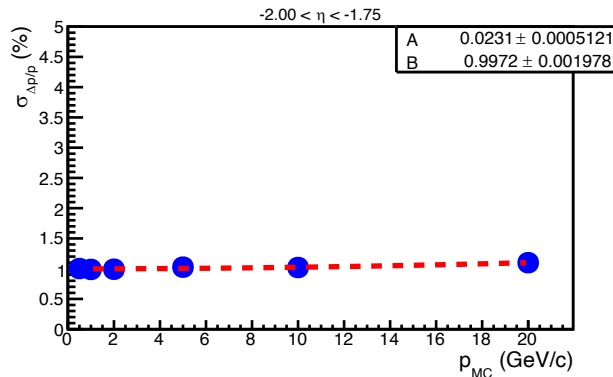
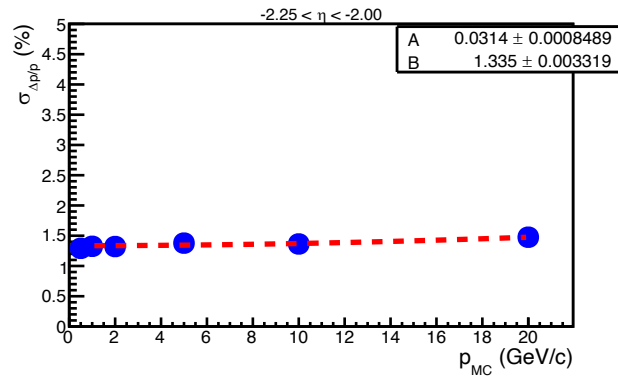
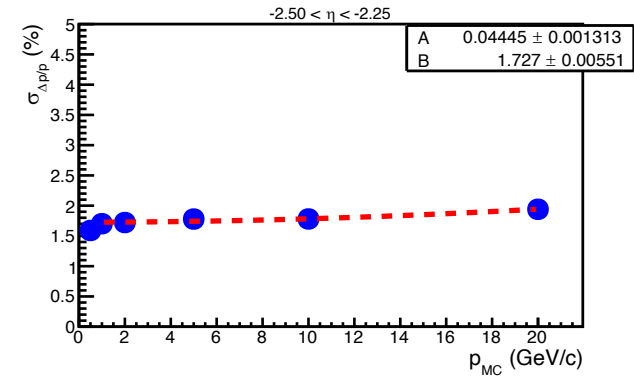
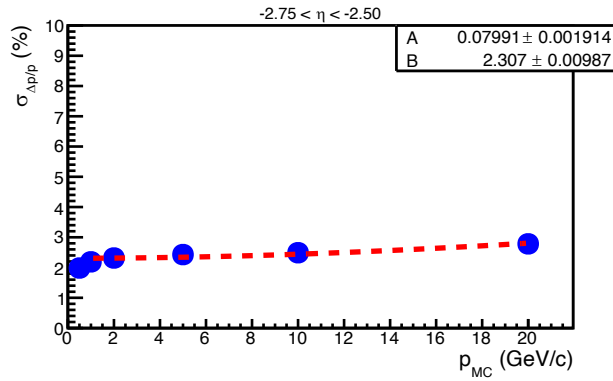
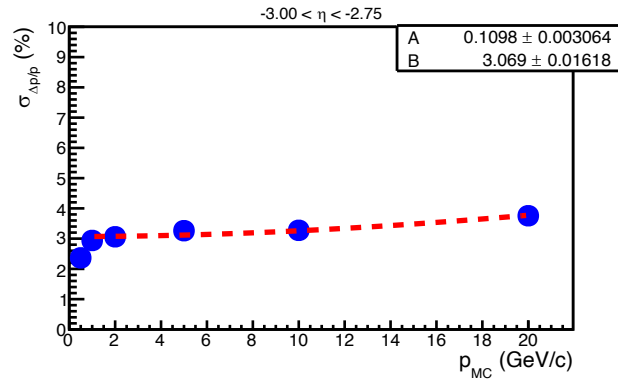
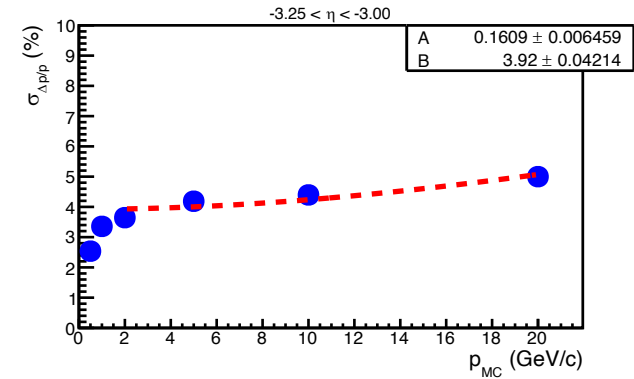
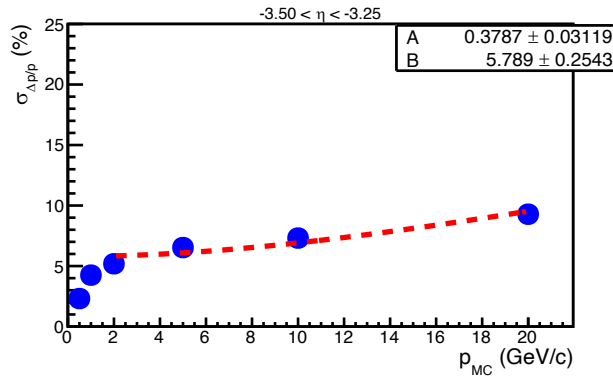
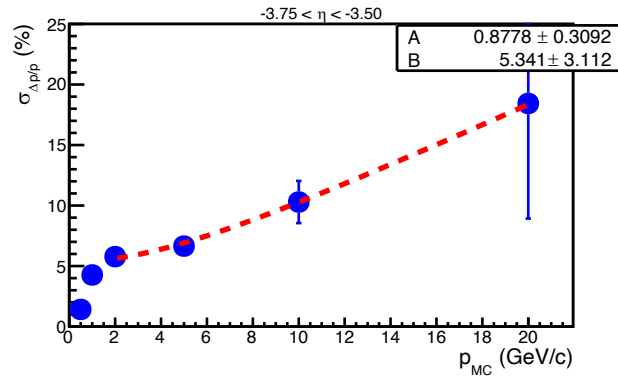
[Wenqing: ePIC Tracking WG 12/08/22](#)



$$F(p) = \sqrt{(A \cdot p)^2 + B^2}$$

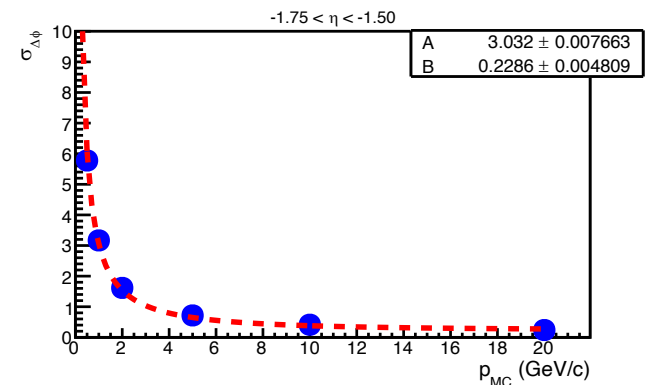
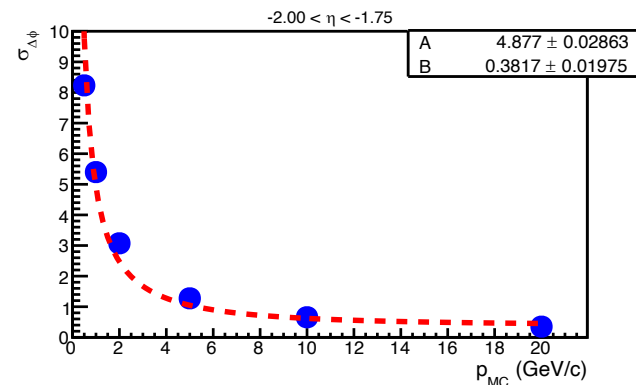
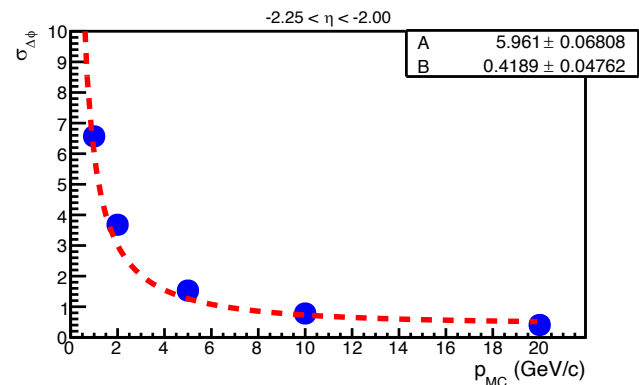
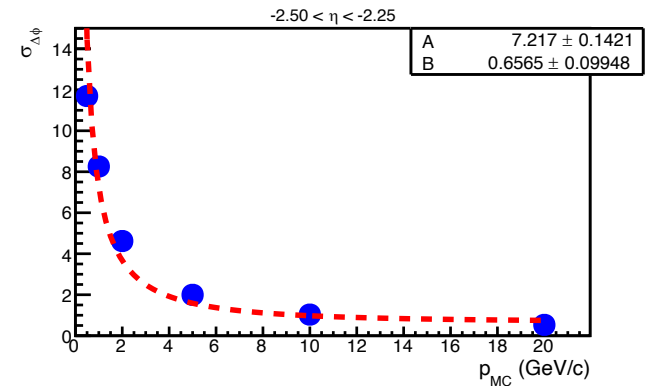
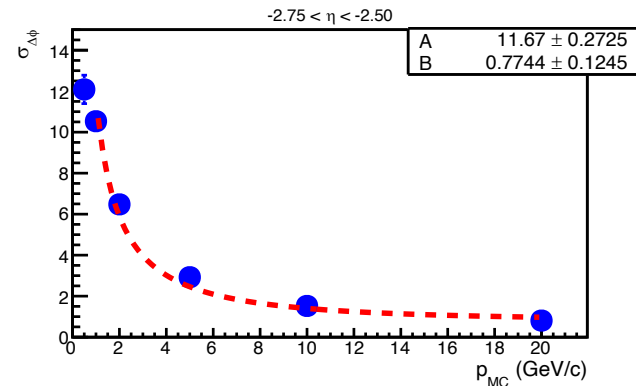
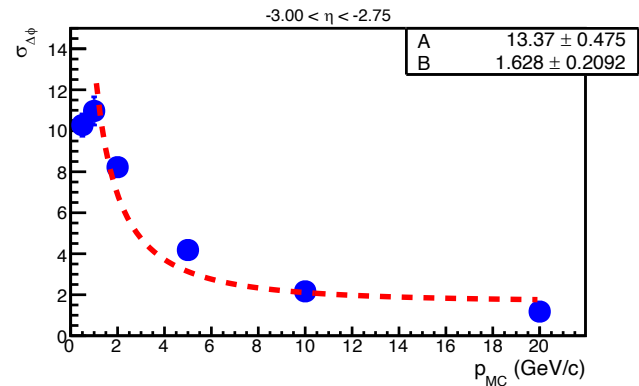
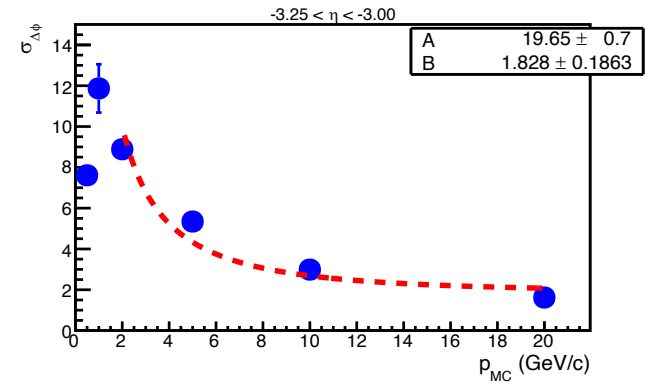
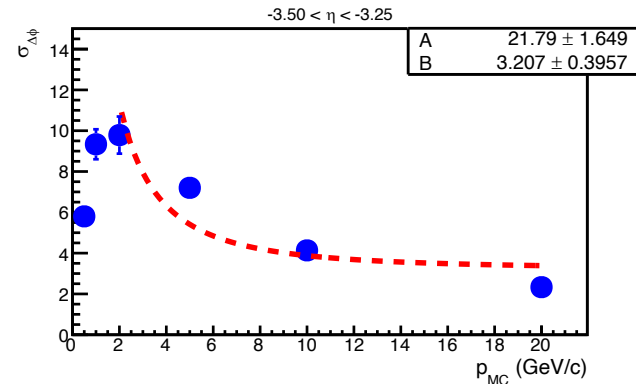
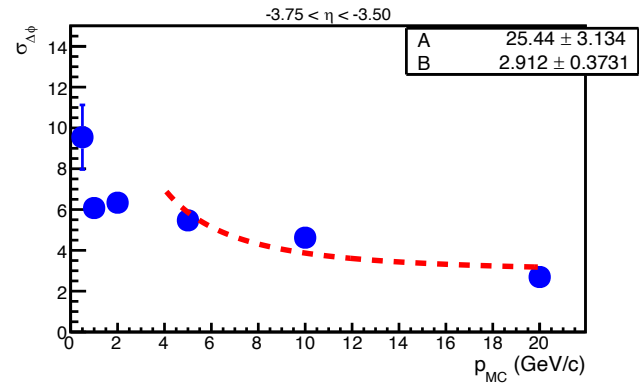


$$F(p) = \sqrt{(A \cdot p)^2 + B^2}$$



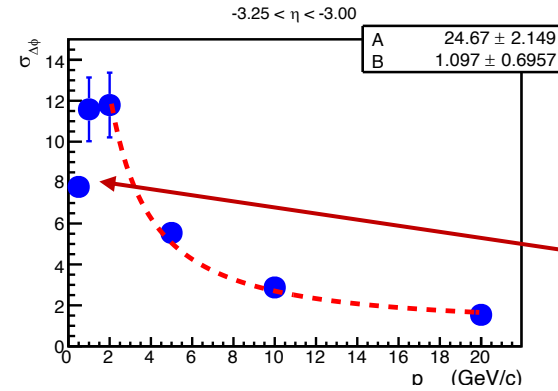
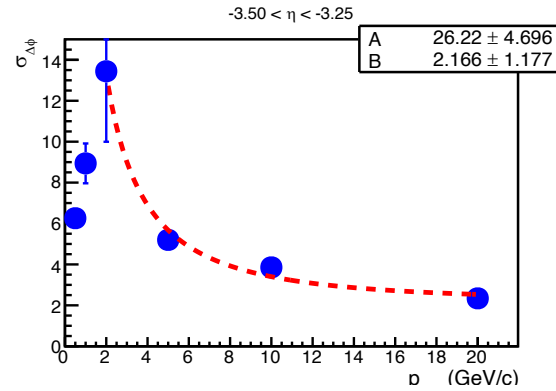
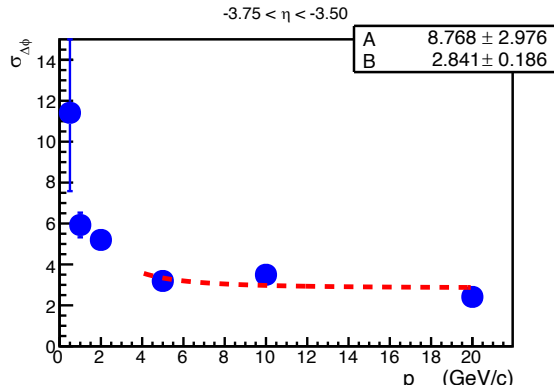
$\Delta\phi$ – main (@vertex)

$$F(p) = \sqrt{(A/p)^2 + B^2}$$

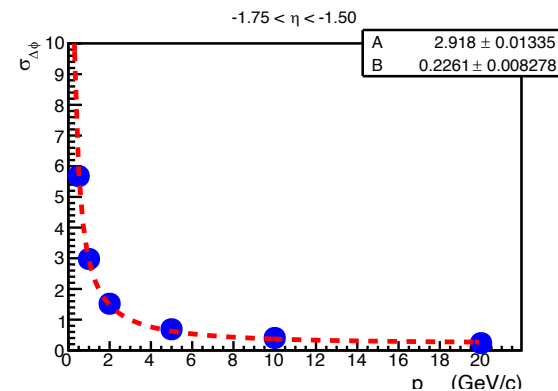
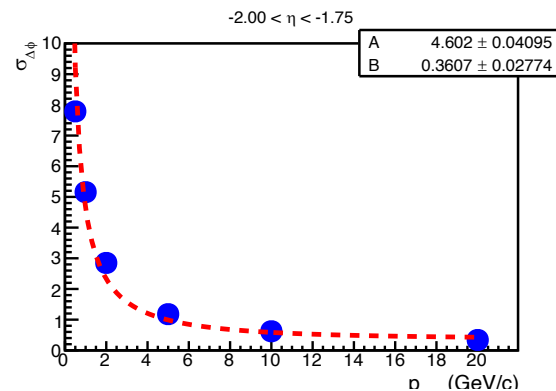
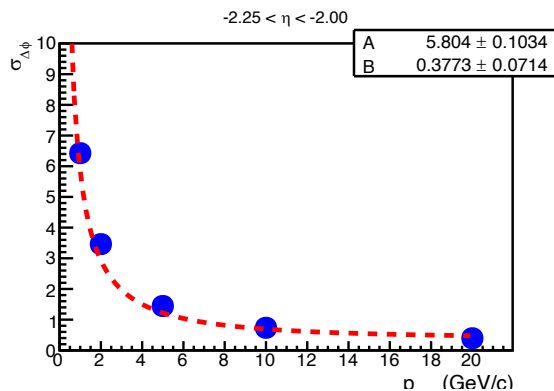
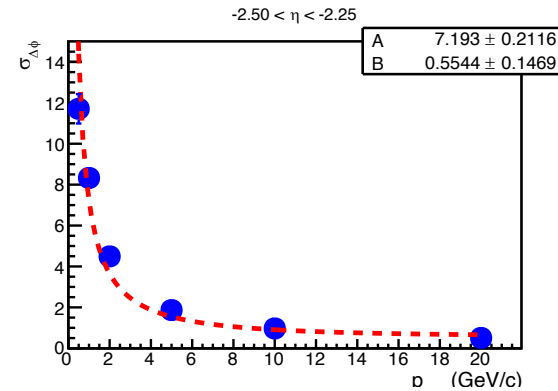
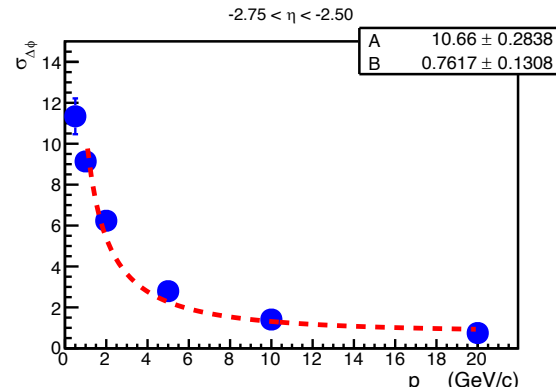
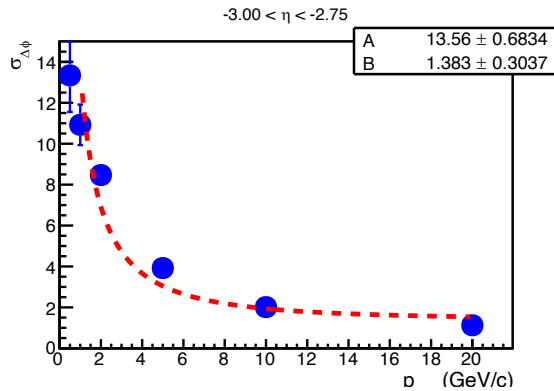


$\Delta\phi - 22.11.2$ (@vertex)

$$F(p) = \sqrt{(A/p)^2 + B^2}$$

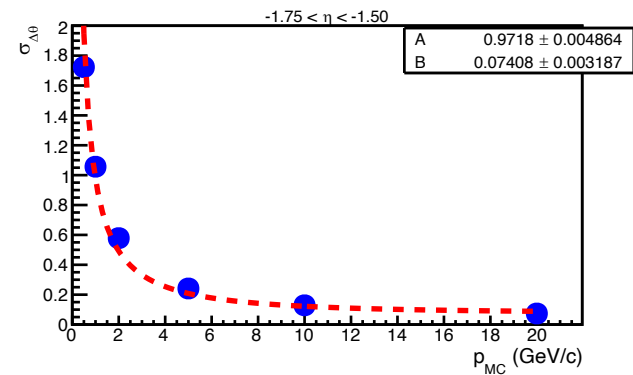
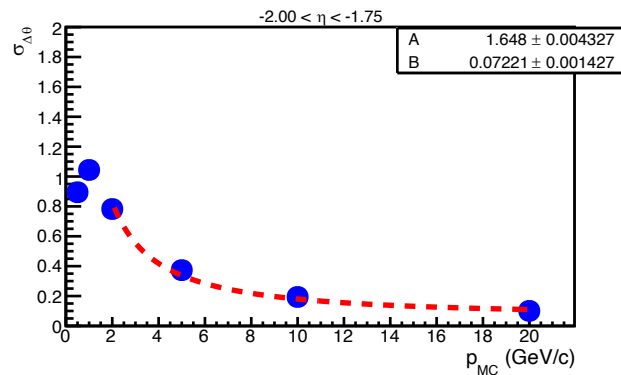
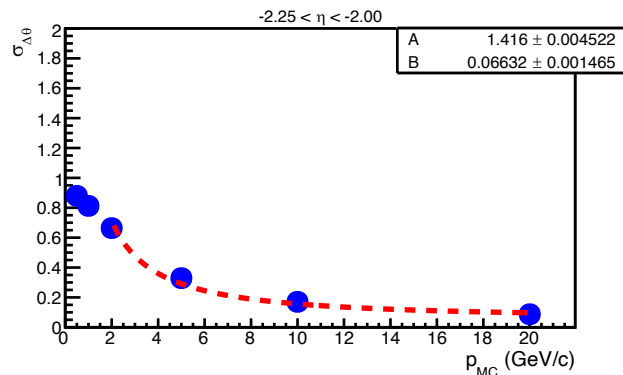
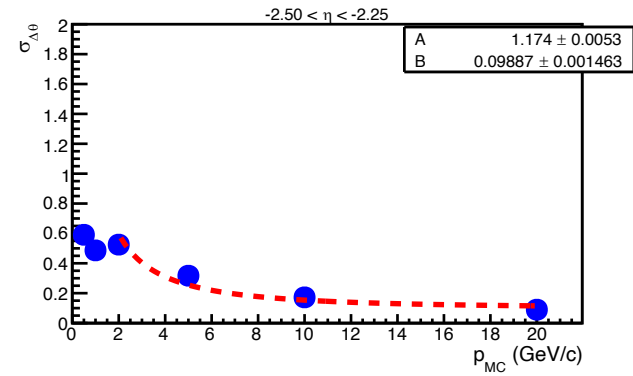
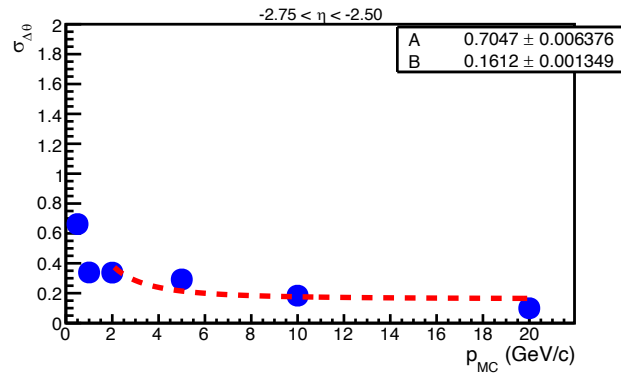
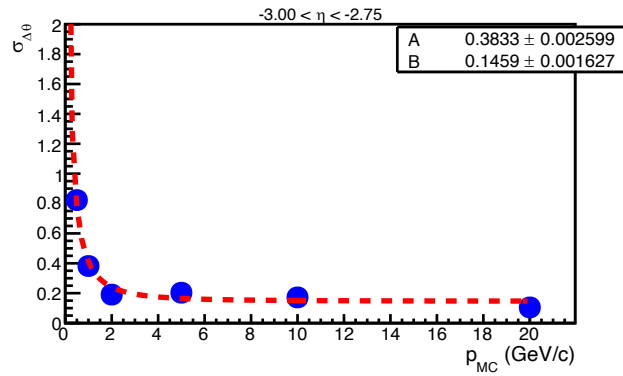
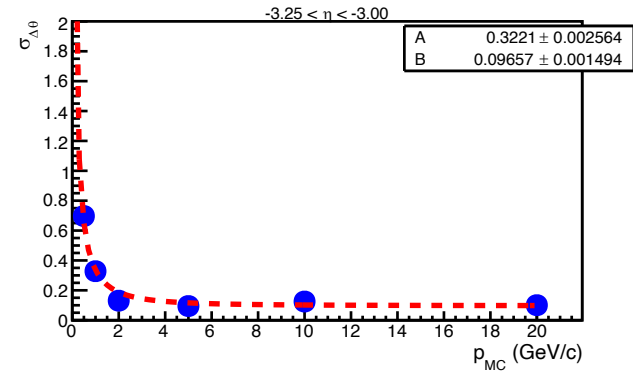
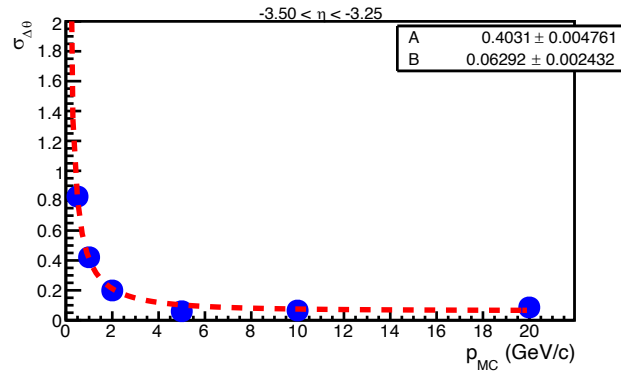
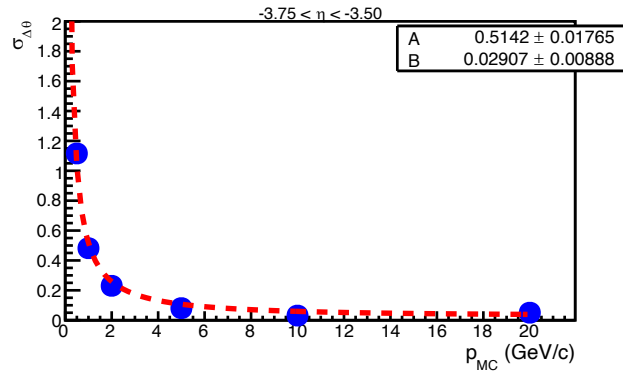


Turn over related to not smearing truth inputs. Mostly large eta-low momentum



$\Delta\theta$ – main (@vertex)

$$F(p) = \sqrt{(A/p)^2 + B^2}$$



$\Delta\theta - 22.11.2$ (@vertex)

$$F(p) = \sqrt{(A/p)^2 + B^2}$$

