



DCA distribution check at 3 GeV 2021 Dataset

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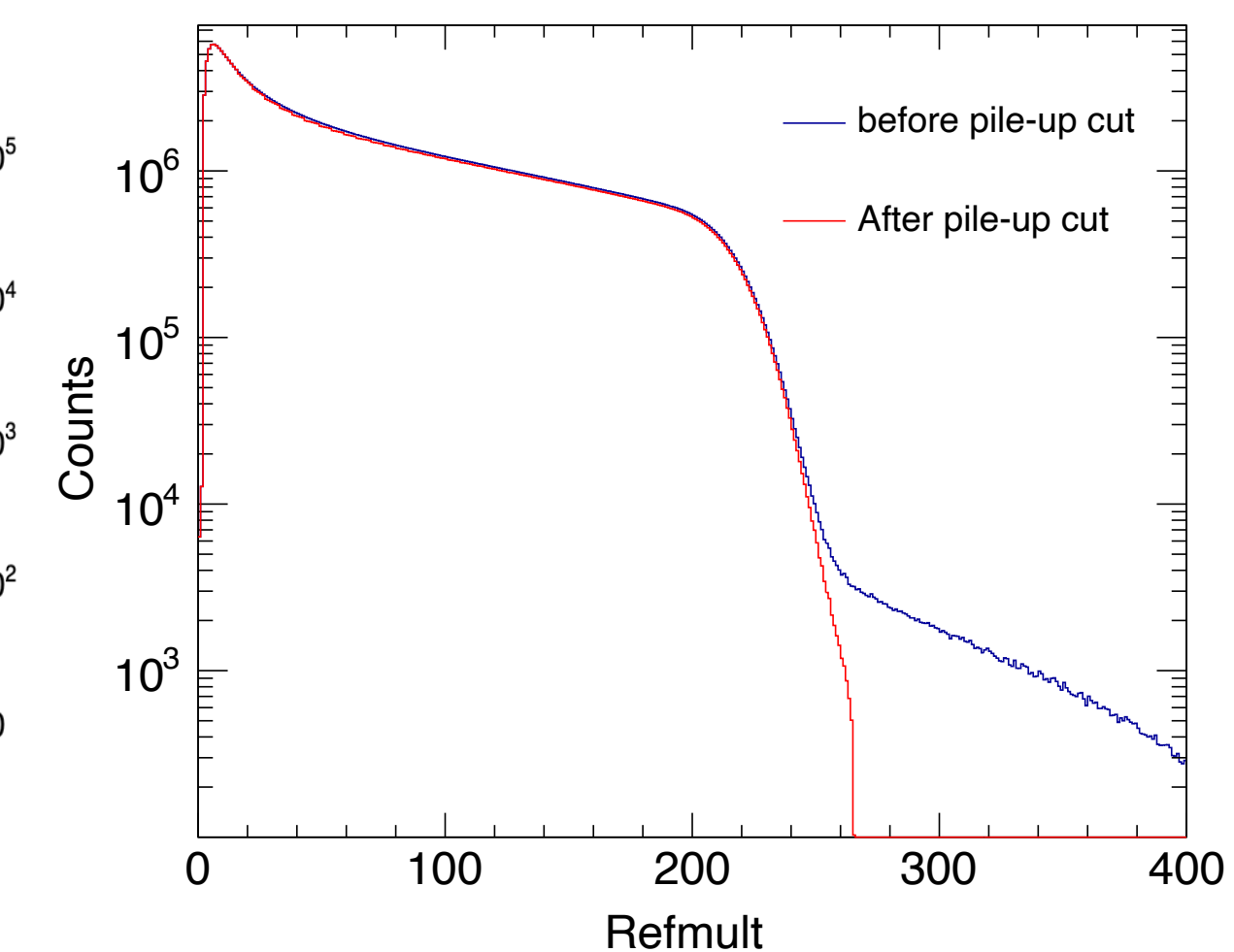
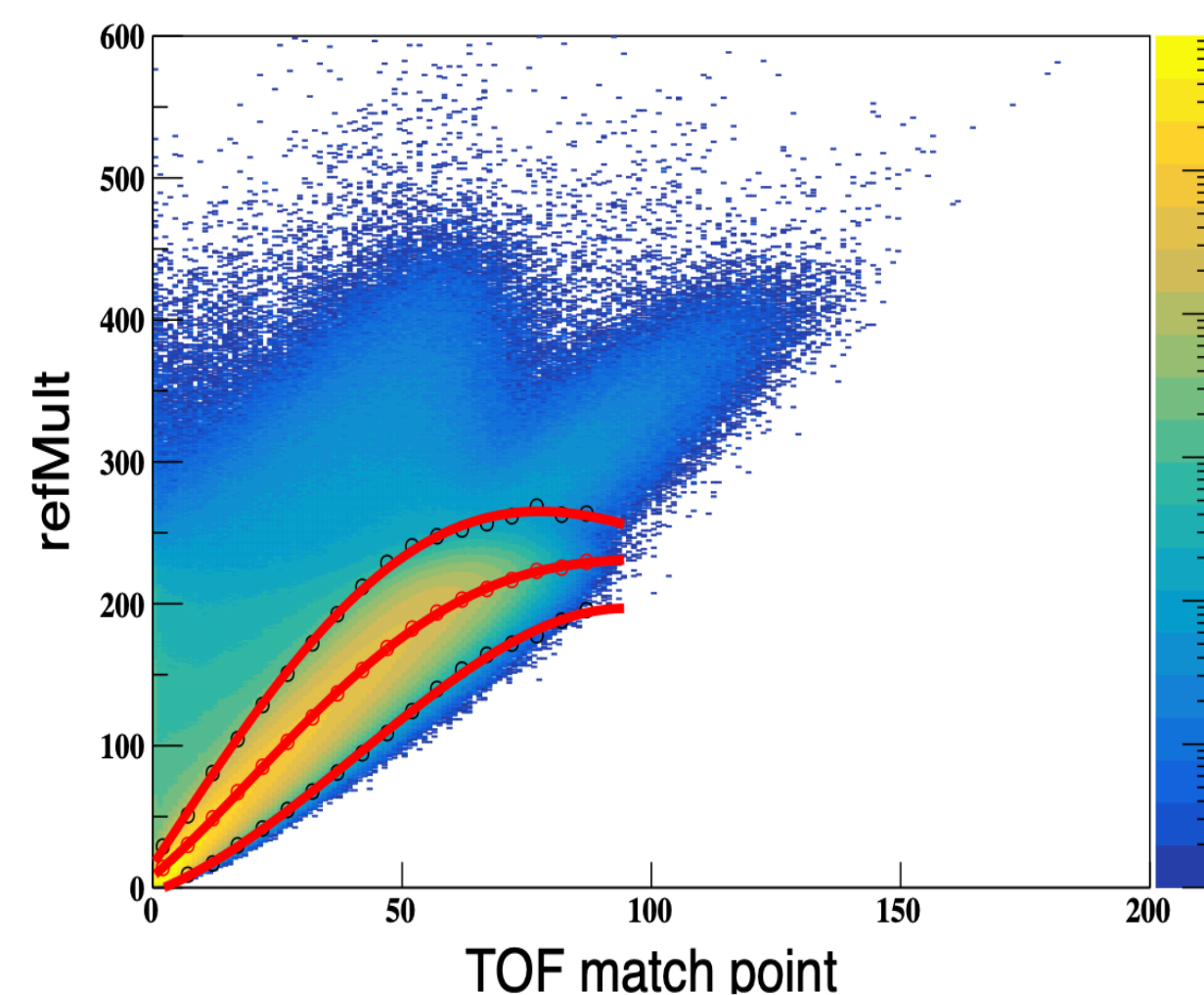
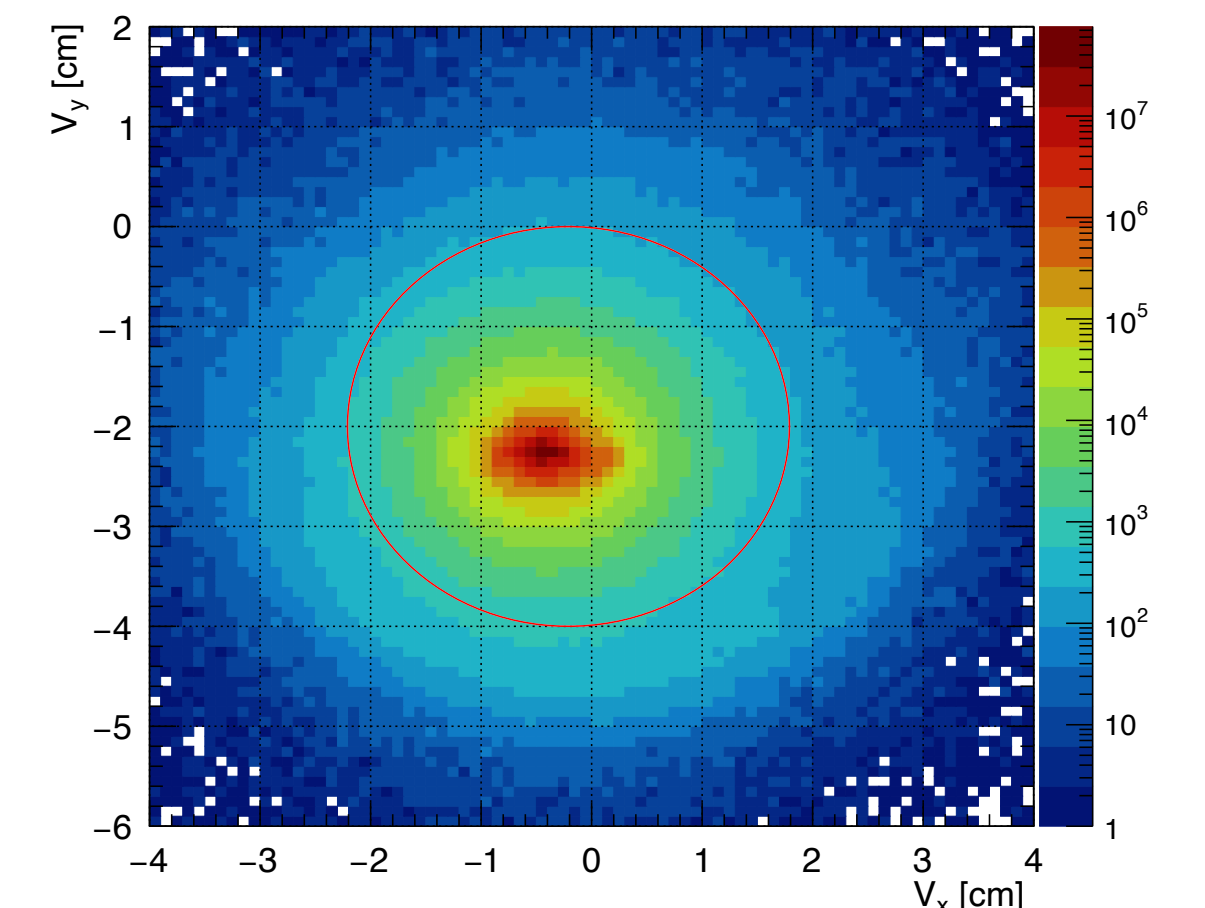
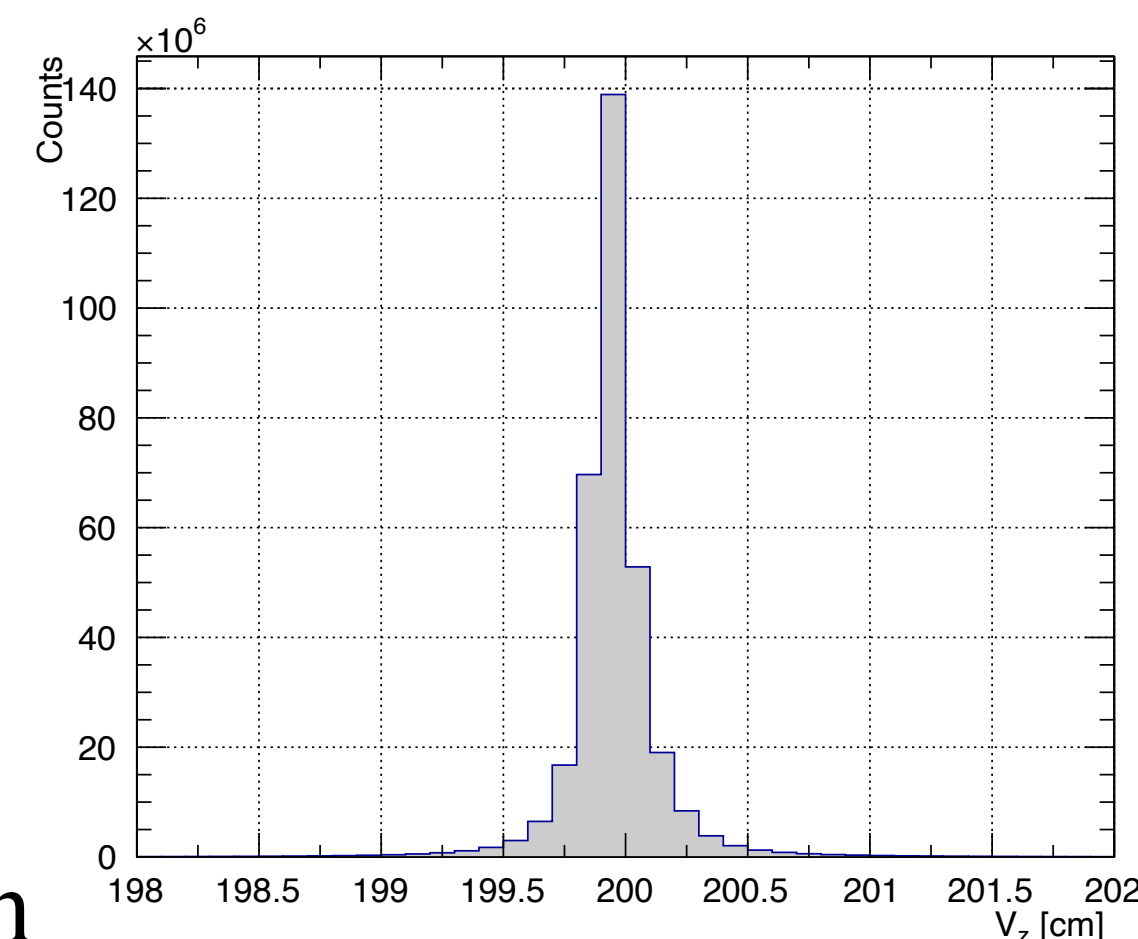
Sep 9, 2026



Measurement at 2021 3.0 GeV

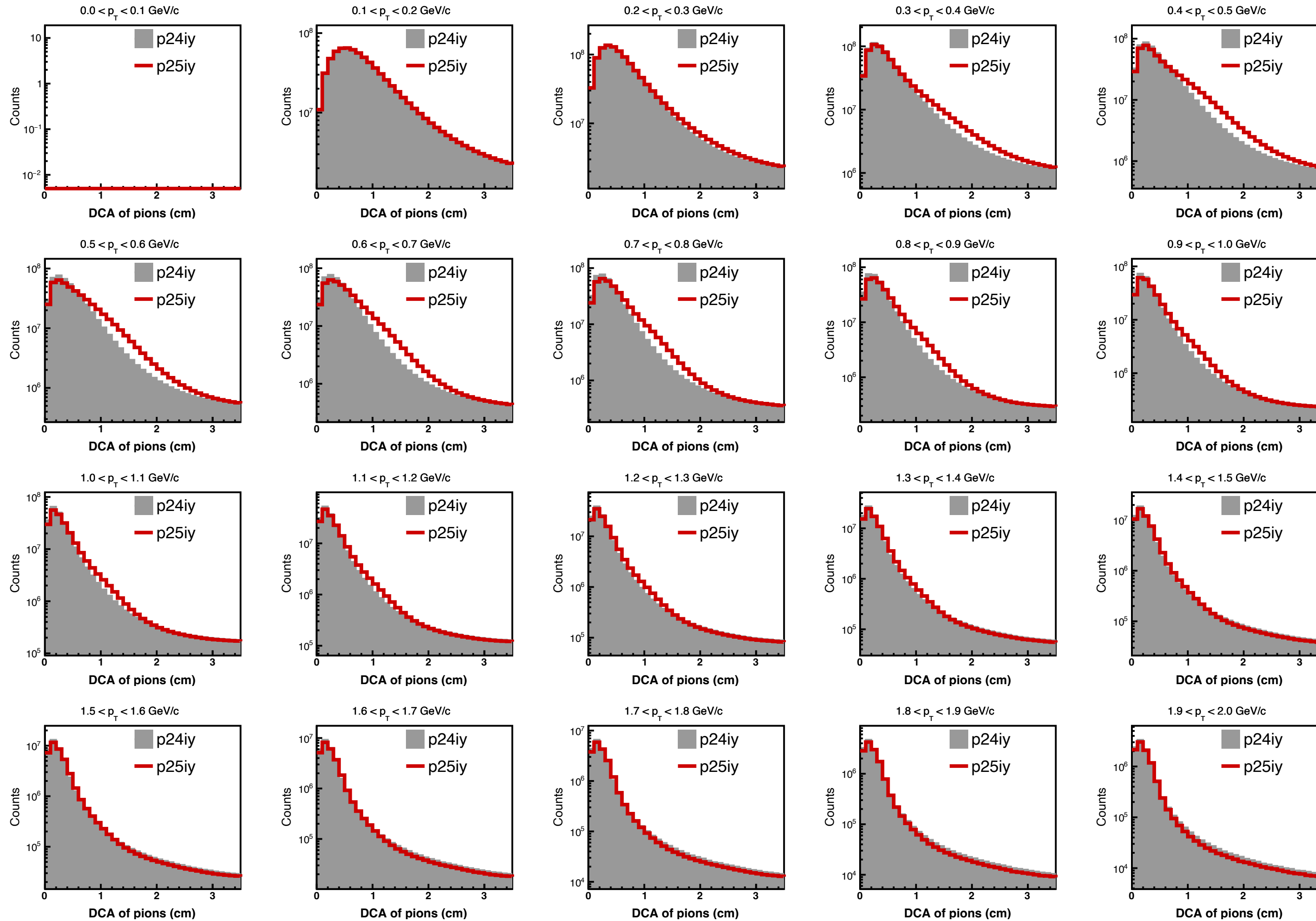


- Dataset: Au+Au $\sqrt{s_{NN}} = 3.0$ GeV, 2021
- Production Tag: P25iy, SL25y
- Triggers used: 820010, 820020, 820030
- Vertex cut: $198 < V_z < 202$ cm, $\sqrt{V_x^2 + (V_y + 2)^2} < 2$ cm
- Bad run, pile-up events are rejected
- Centrality definition (refmult >):
 $\{5, 10, 19, 33, 51, 77, 111, 155, 183\}$
- Event statistics: 300 M





Pions DCA comparison: P25iy vs. P24iy



Track selection:

$n\text{HitsFit} > 15$

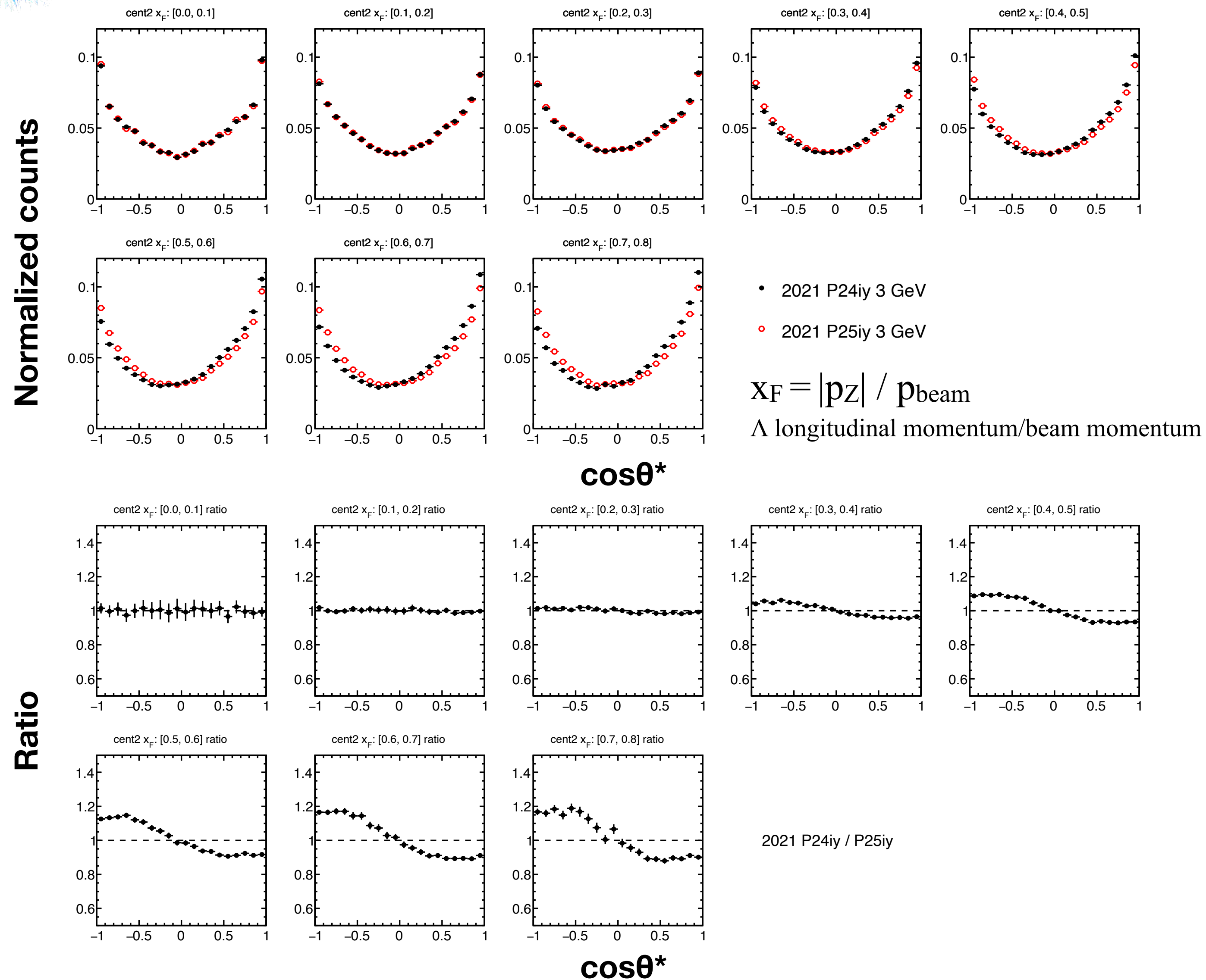
$n\text{HitsRatio} > 0.52$

$|\text{nSigma pion}| < 3$

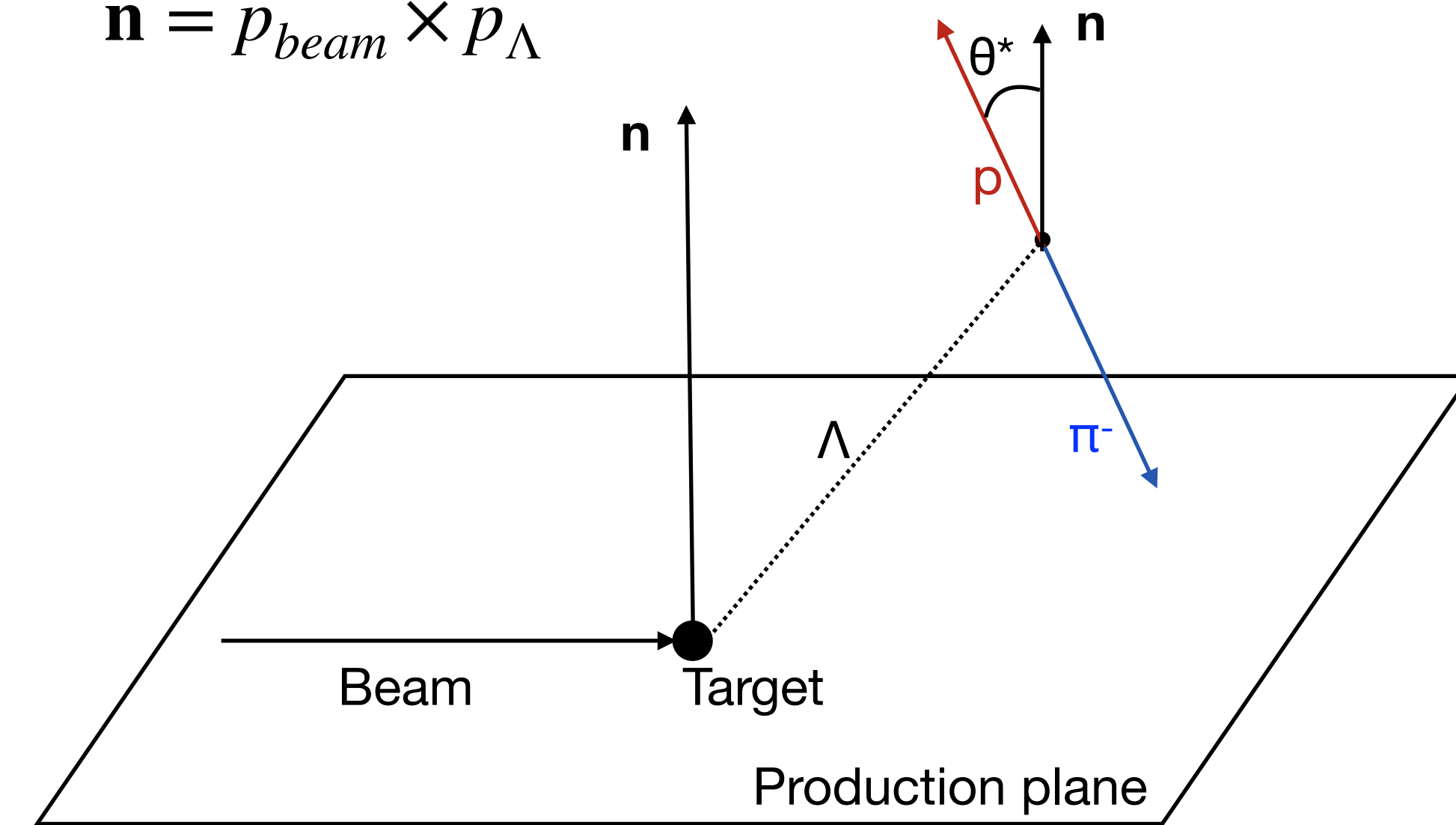
- New calibration (P25iy) pions DCA significantly differ from the p24iy especially p_T [0.3, 1.0] GeV/c



Influence to Λ polarization measurements



$$\mathbf{n} = \vec{p}_{beam} \times \vec{p}_{\Lambda}$$



- P25iy $\cos\theta^*$ significantly differ with P24iy version



Summary



- Pion DCA distributions with the P25iy calibration differ markedly from those with P24iy. This difference will affect the polarization measurement
- Which updates may have caused this change?

Hello,

Email of P25iy updates

Following up on the production of production_3p85GeV_fixedTarget_2021 with calibrated ET0F...

As noted previously (see the referenced email below), we already had a P24iy production of the low luminosity part of this dataset without ET0F calibrated, so we have moved to a new production tag for the production of the low luminosity with ET0F calibrated: P25iy. Hopefully there isn't too much confusion about this, but please ask if you are uncertain.

Thank you very much!



Backup

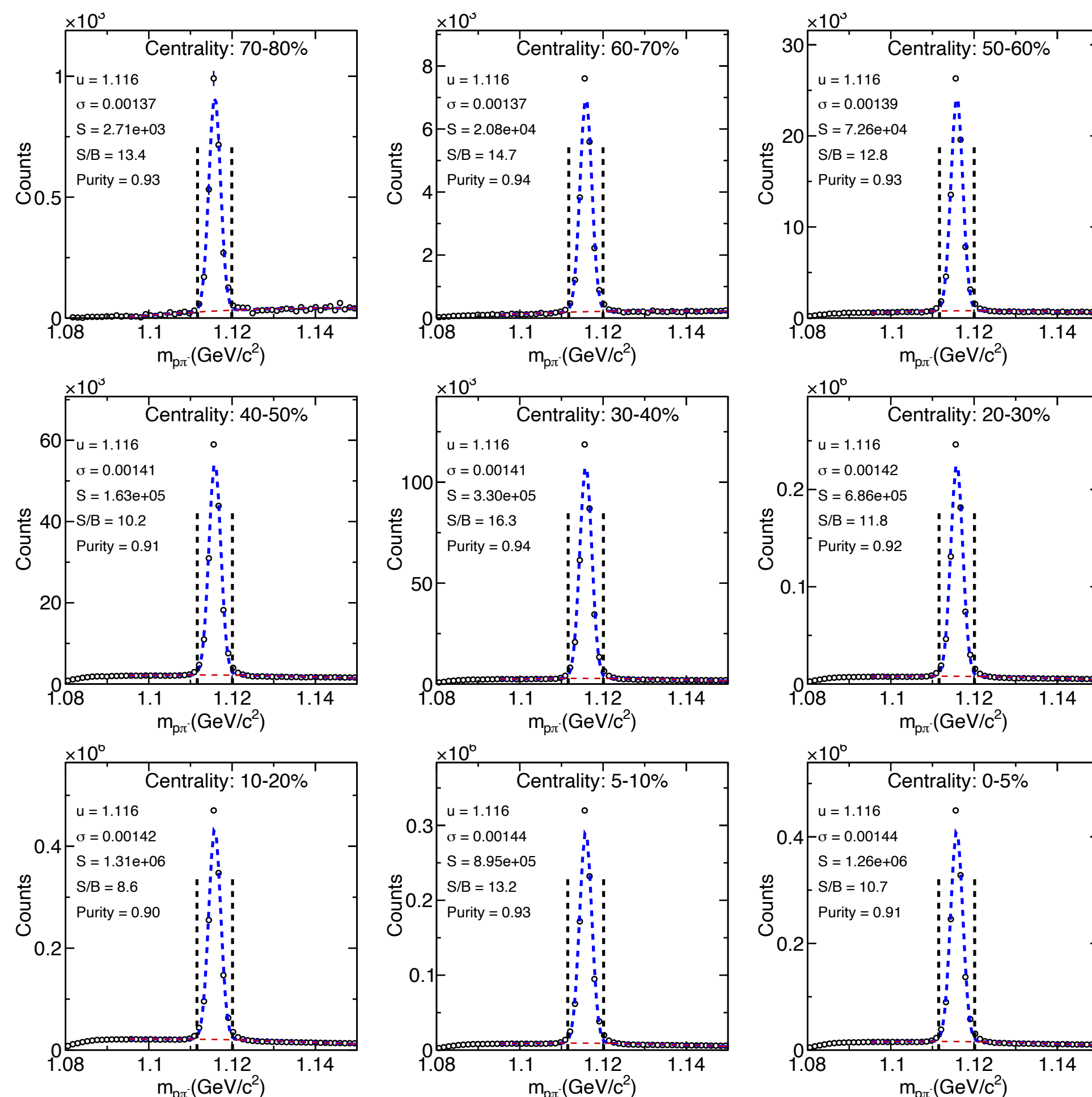




Backup: Λ reco in Data



Au+Au 3.0 GeV (2021), P25iy, SL25y



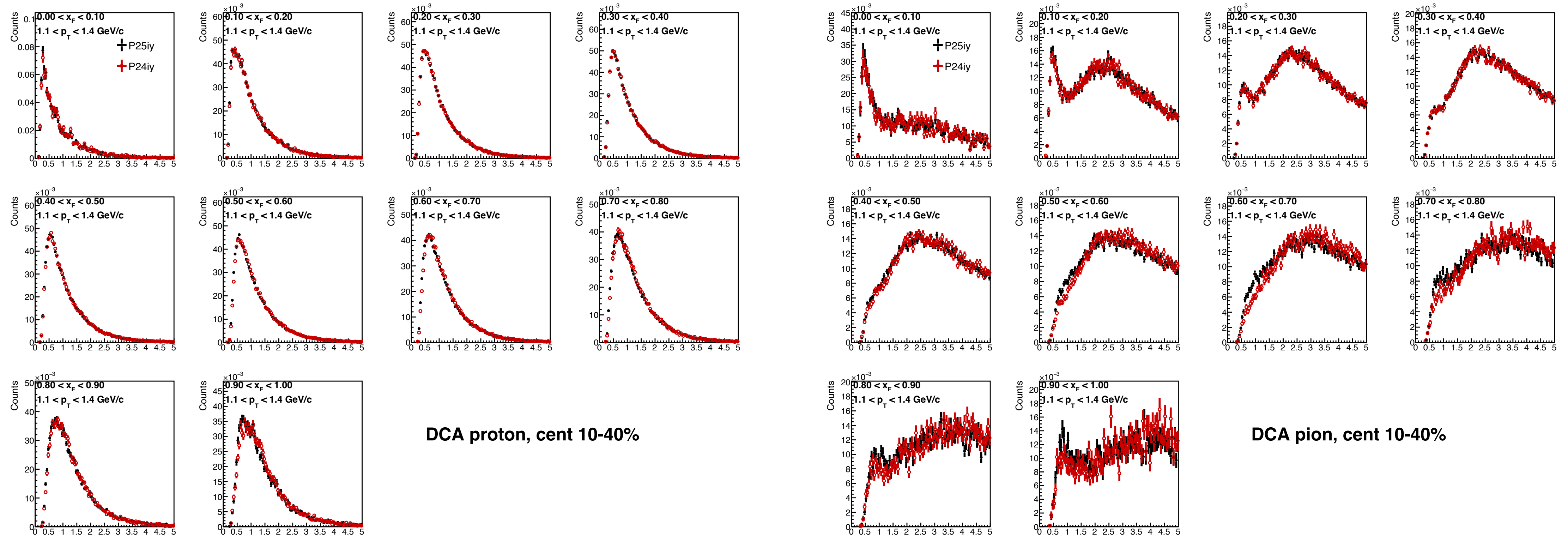
Reconstruction cuts:

- Decay length > 5 cm
- Daughter dca < 0.65 cm
- Λ dca < 0.65 cm
- nHitsFit > 15
- nHitsRatio > 0.52
- $|\ln\text{Sigma}| < 1.5$
- cosrp > 0.995
- DCA/err of proton > 20
- DCA/err of pion > 4

- Purity $> 90\%$ for each centrality



Daughter DCA comparison



- Data P25iy-P24iy comparison: proton DCA is in good agreement, while pion DCA show slight difference