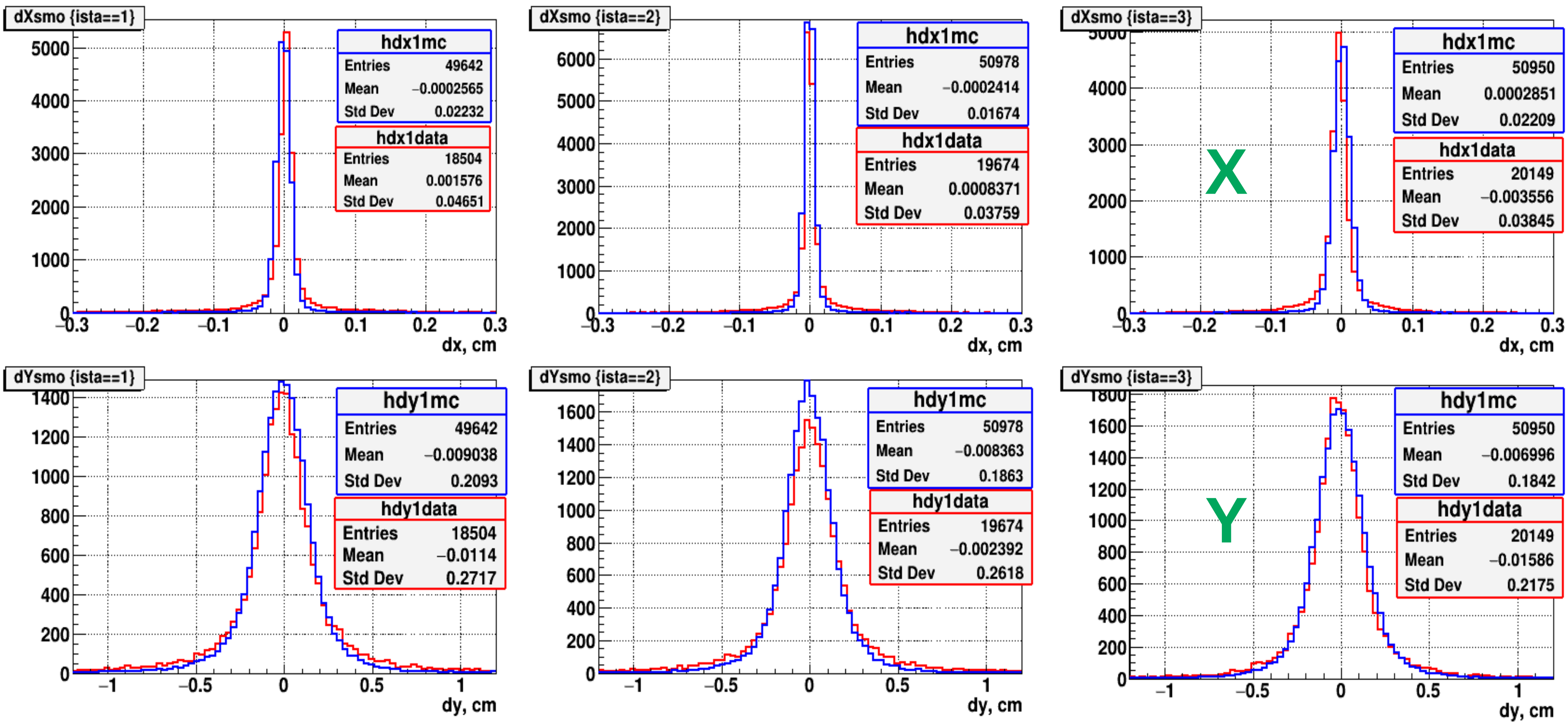
X/Y Si/GEM residuals tuning for MC

- Residuals tuning results
- χ^2/ndf for identified tracks (Data vs MC)
- DCA for $\pi+$ (Data vs MC)
- Number of tracks in PV vs DCA
- DCA in Data after background subtraction

Residuals tuning

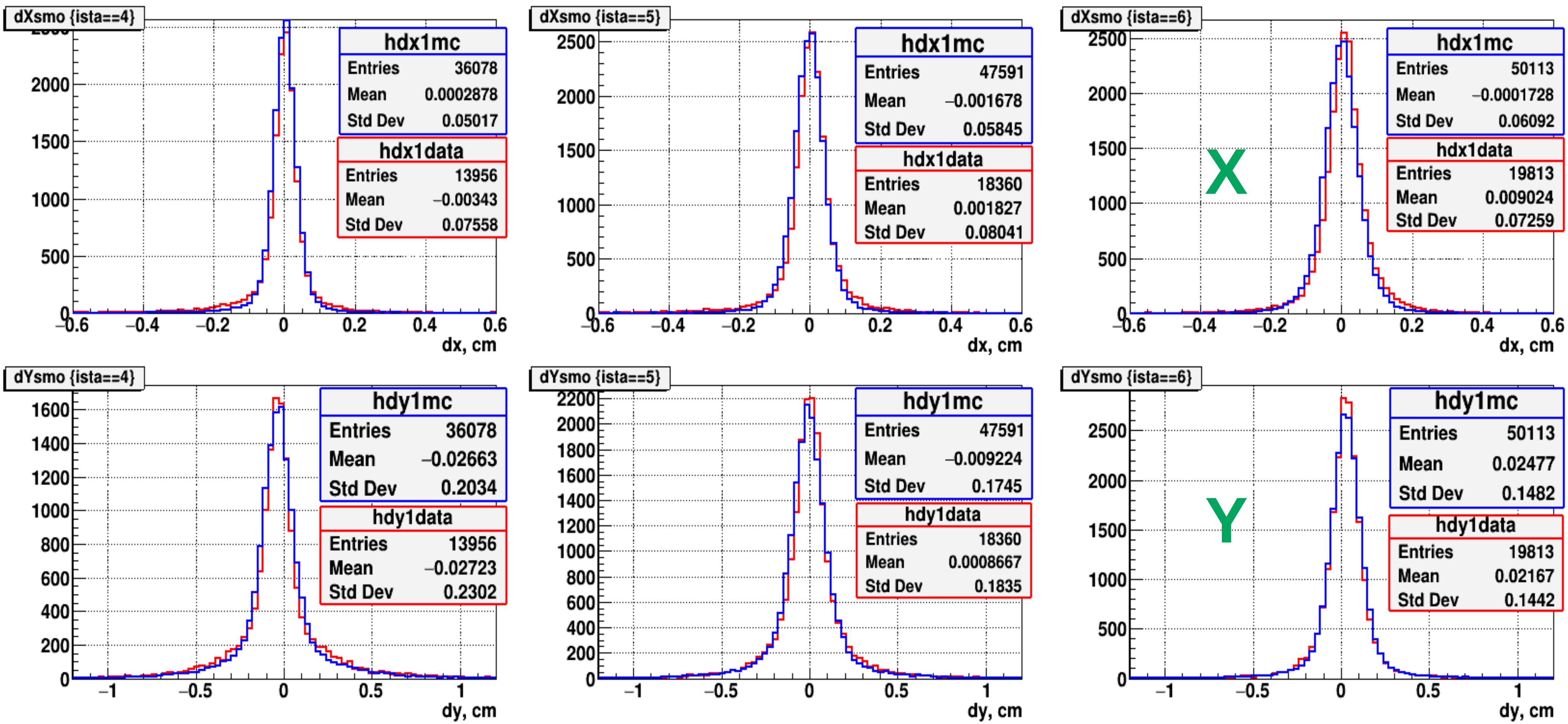
- Using the same pools for MC as for Data
- Gaussian random smearing of X/Y coordinates for Si/GEM MC points

Residuals tuning results (Si)



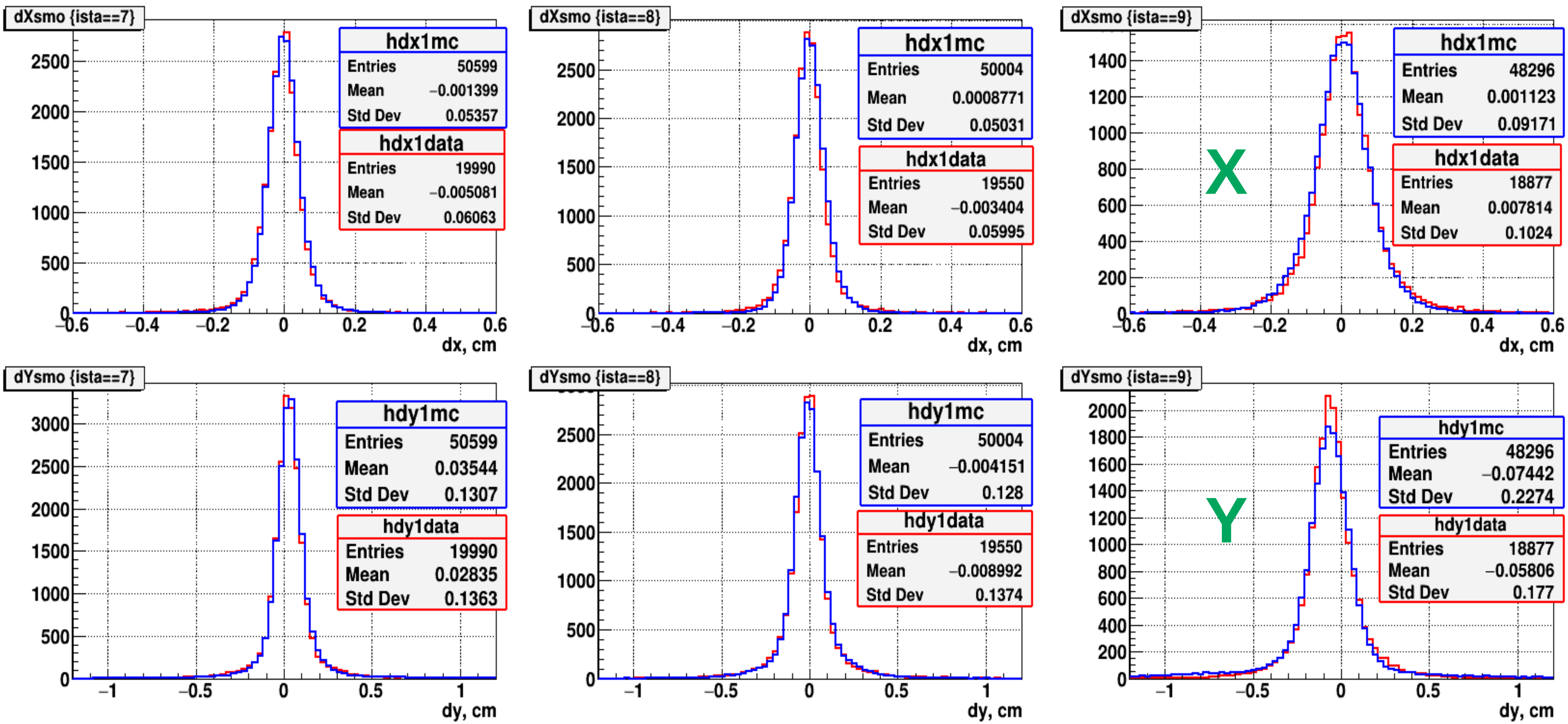
- Tails for Data larger than for MC

Residuals tuning results (GEM)



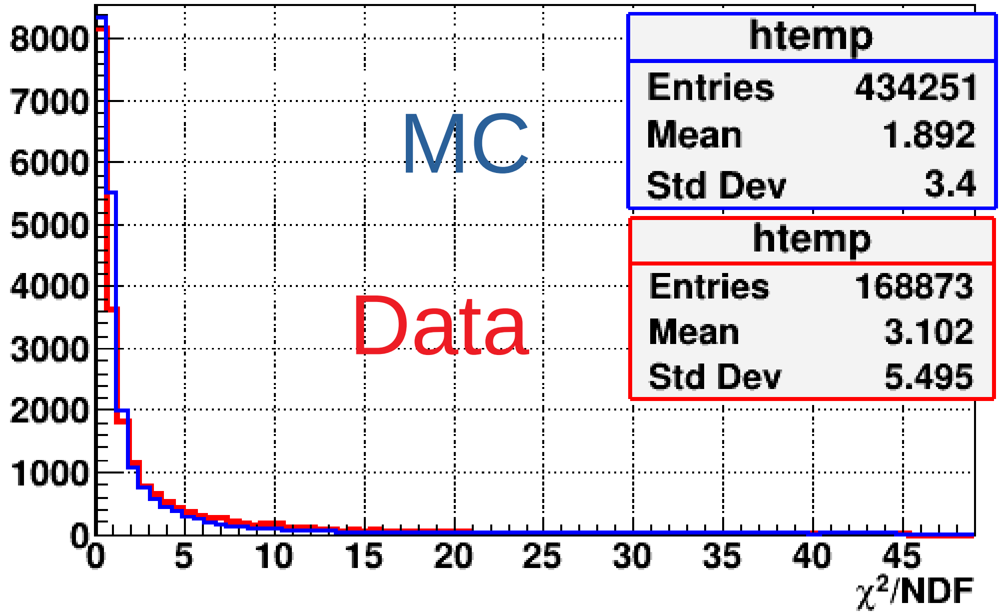
- Residuals for Data are close to MC

Residuals tuning results (GEM)



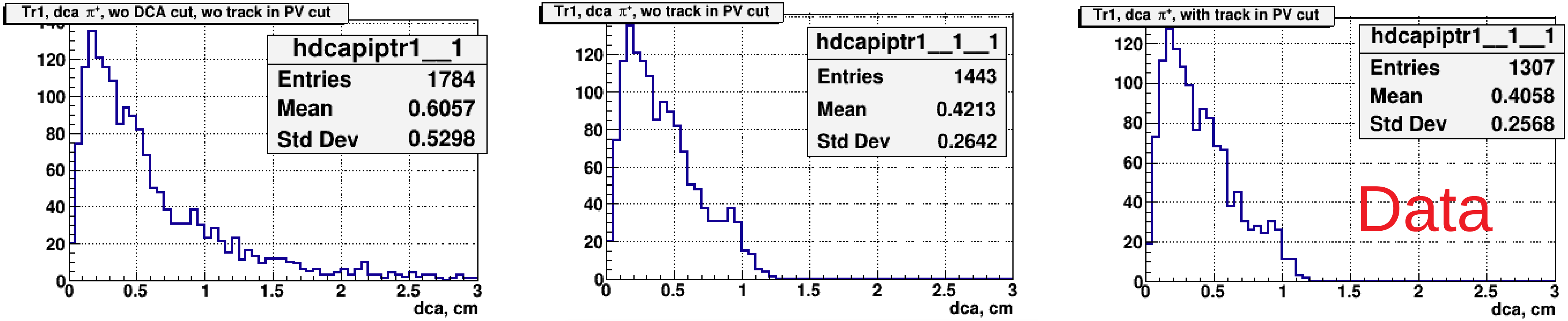
- Residuals for Data are close to MC

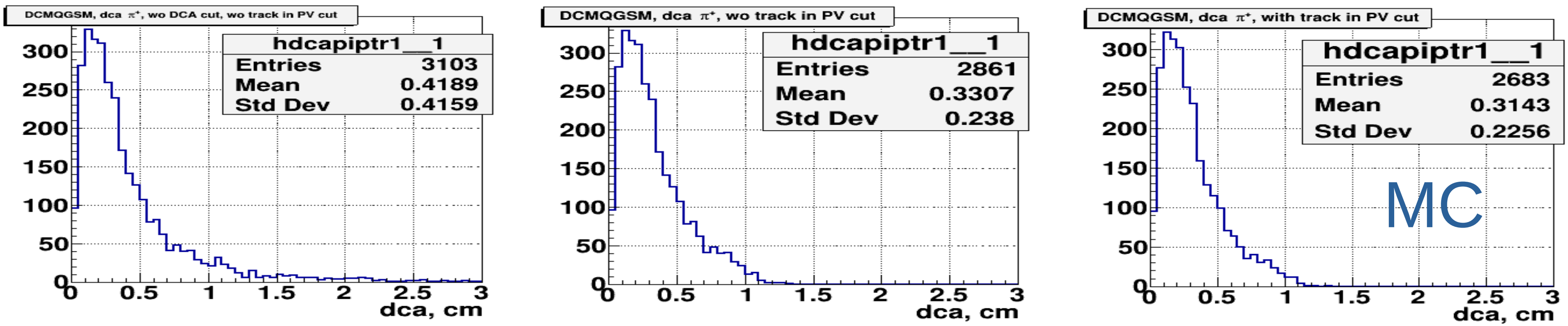
χ^2/ndf for identified tracks



- χ^2/ndf for Data and MC are close to each other

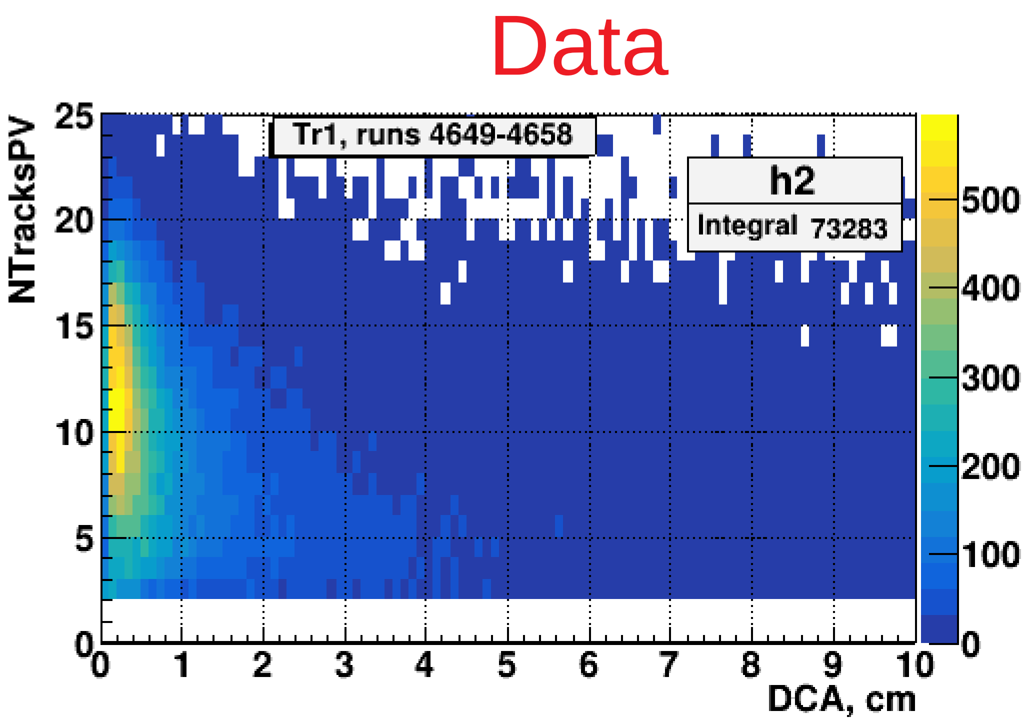
DCA for π^+

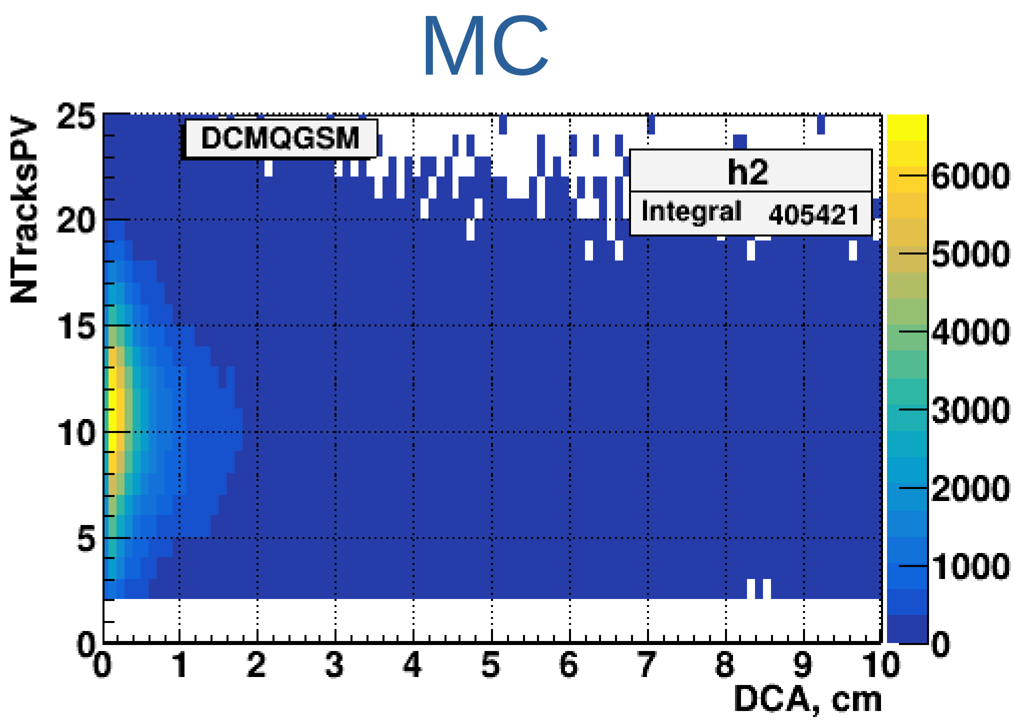




- **“Track from PV”** cut rejects ~10% tracks for Data and ~9% tracks for MC
- **DCA** cut rejects ~21% tracks for Data and ~9% tracks for MC

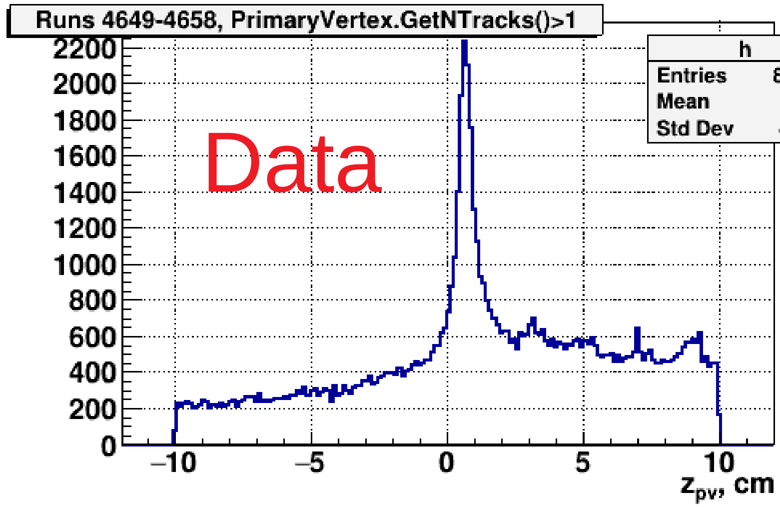
Number of tracks in PV vs DCA

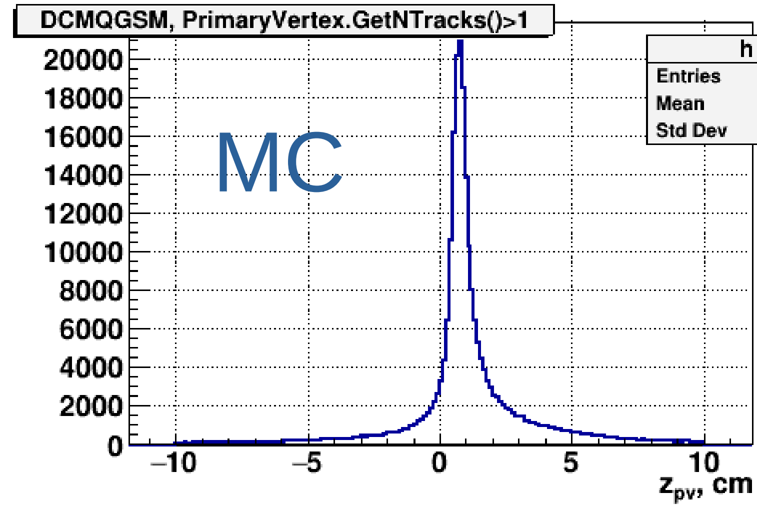


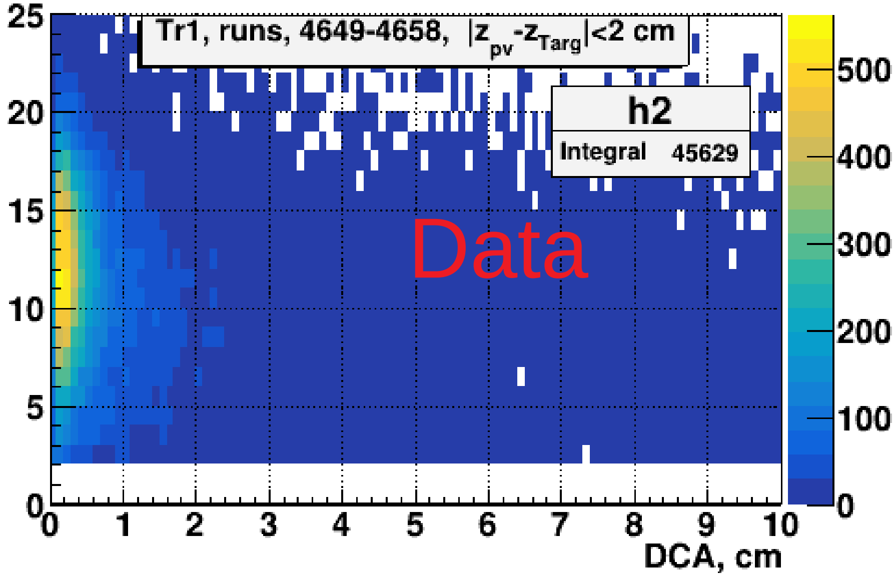


- Long DCA tail corresponds to PV with low number of tracks

Number of tracks in PV vs DCA



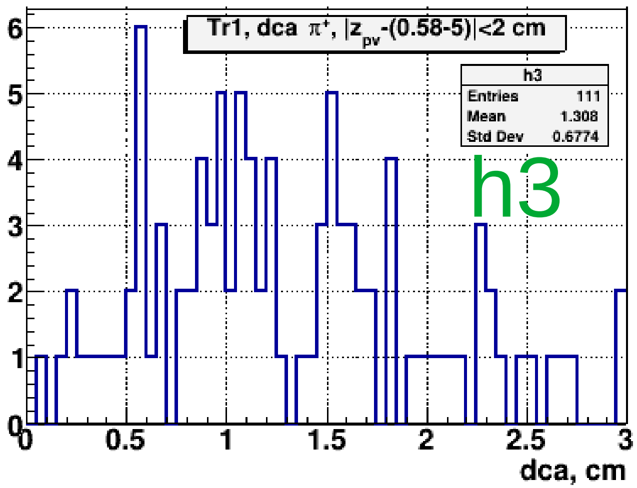


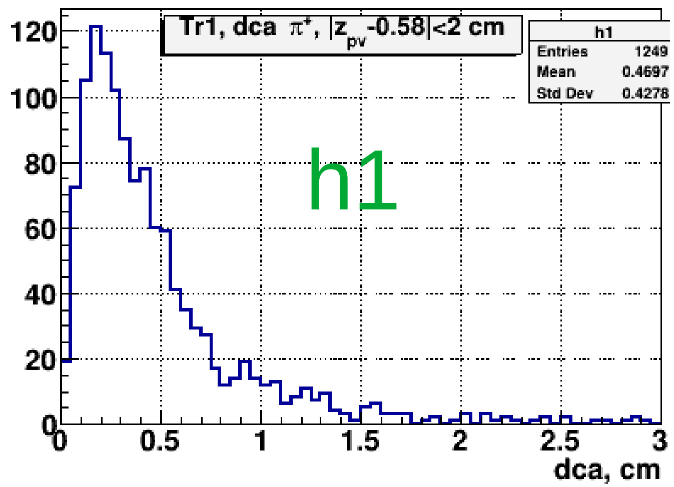


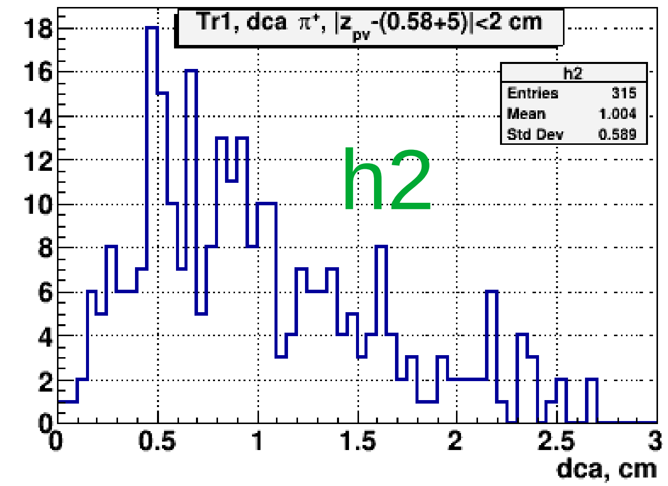
- Cut $|z_{pv}-z_{Targ}|<2$ cm eliminates long DCA tail from PV with low number of tracks

DCA in Data after background subtruction

Data

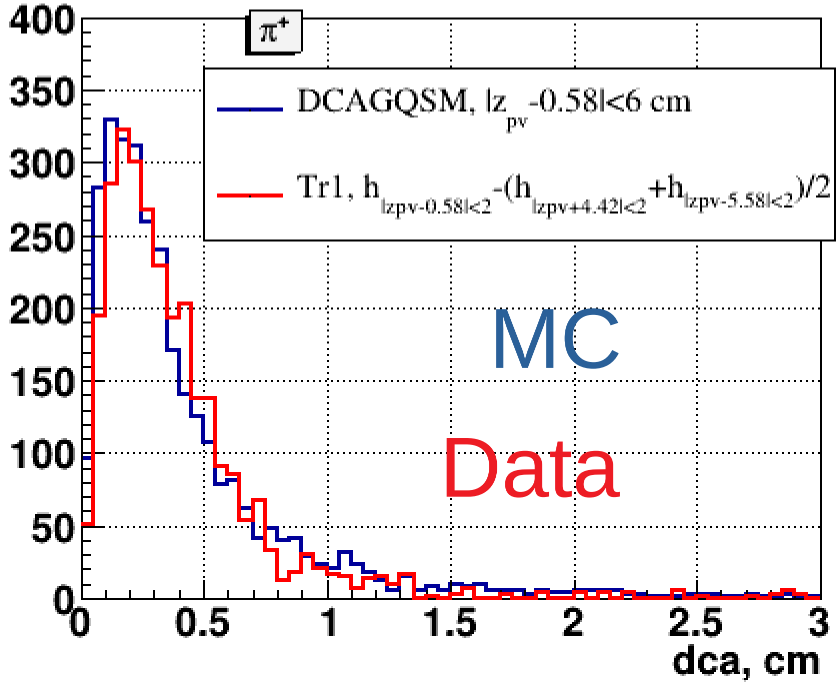






- Background DCA distributions are wider than signal and they have maximum with DCA>0.5 cm

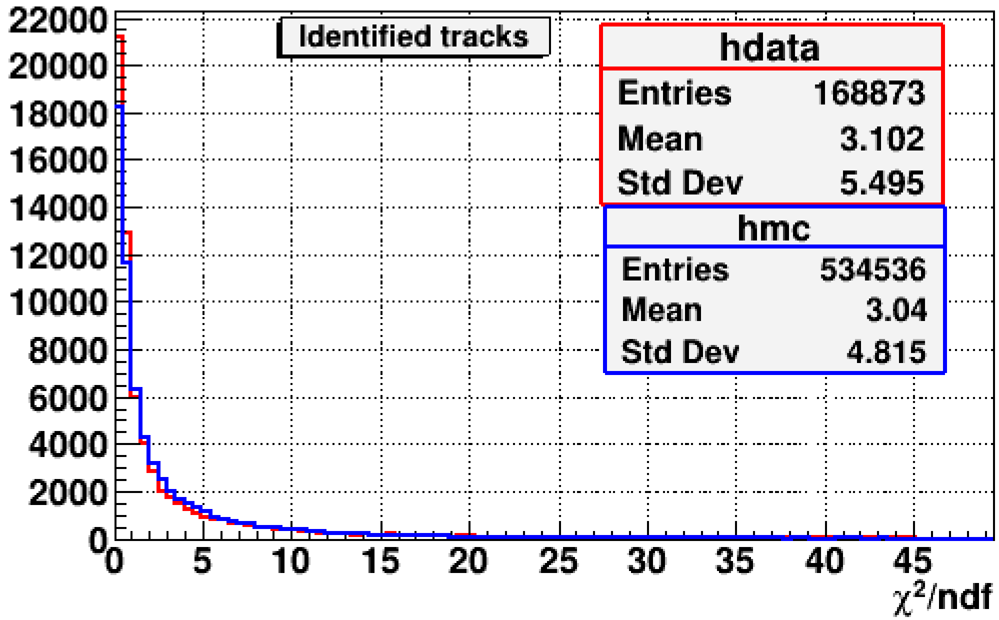
DCA in Data after background subtraction



- $h_{Data}=h1-(h2+h3)/2$
- χ^2/ndf for Data and MC are close to each other
- We need to subtract this background from yields!

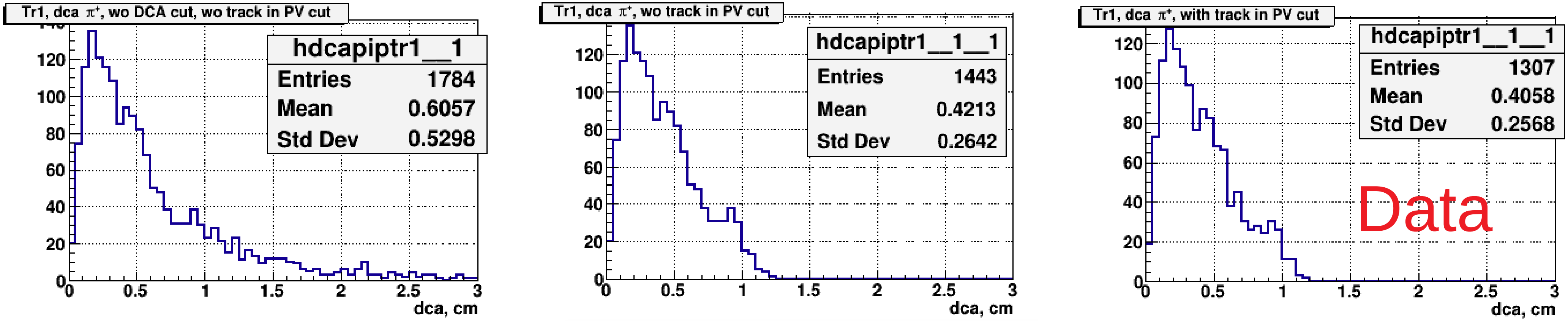
Backup

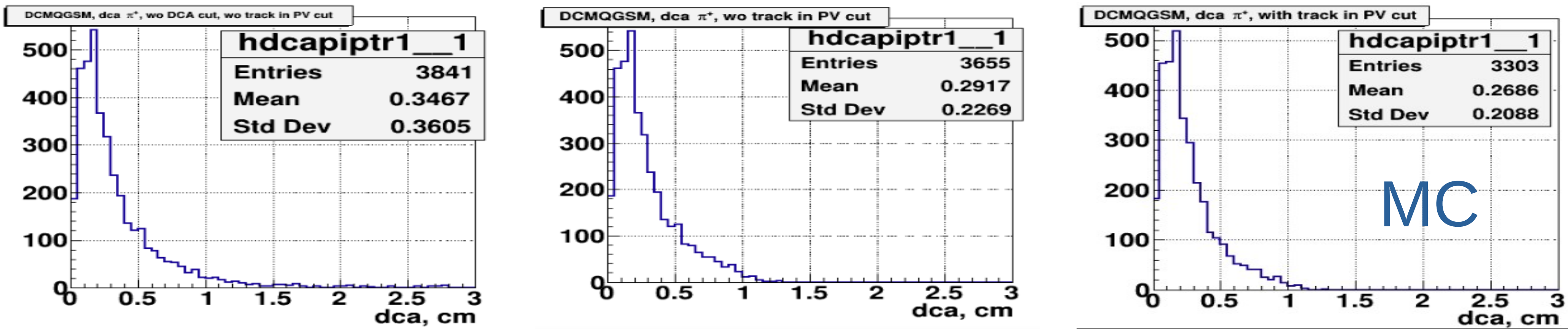
χ^2/ndf for identified tracks



- χ^2/ndf for Data and MC are close to each other

DCA for π^+





- **"Track from PV"** cut rejects ~10% tracks for Data and ~10% tracks for MC
- **DCA** cut rejects ~21% tracks for Data and ~5% tracks for MC

Track from PV cut (wo CSC)

Track from PV

	Trig / Targ	All
K^+/π^+	**Tr1**	2637/76158 = **0,03463**
	Tr2	1674/60779 = **0,02754**
	Tr3	1460/38114 = **0,03831**

$0.5<p_{\pi+}<2.0$ GeV/c

$0.5<p_{K+}<2.0$ GeV/c

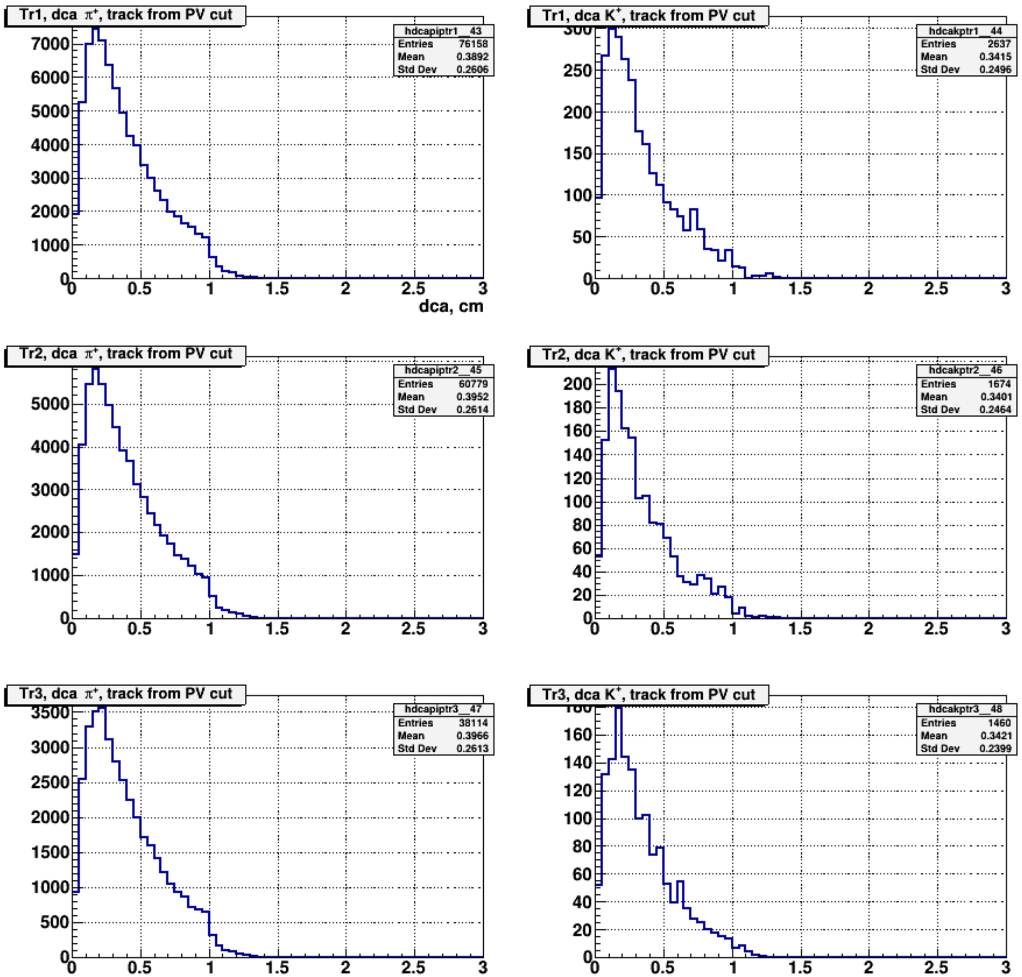
Wo track from PV cut

	Trig / Targ	All
K^+/π^+	**Tr1**	4079/109842 = **0,03714**
	Tr2	2464/84117 = **0,02929**
	Tr3	2168/54104 = **0,04007**

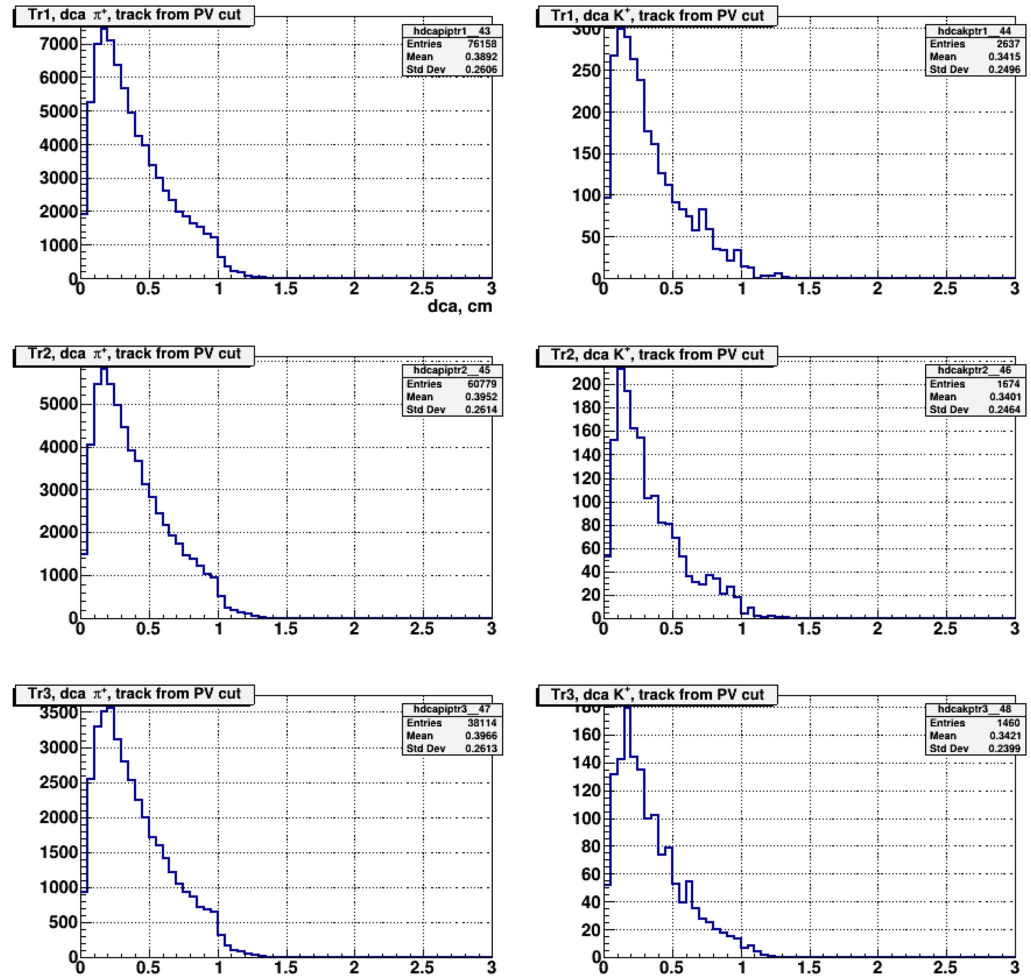
- Statistics almost twice smaller with track from **PV** cut
- K^+/π^+ values for **triggers** with and without track from **PV** cut are close

Track from **PV** cut (wo CSC)

Track from PV



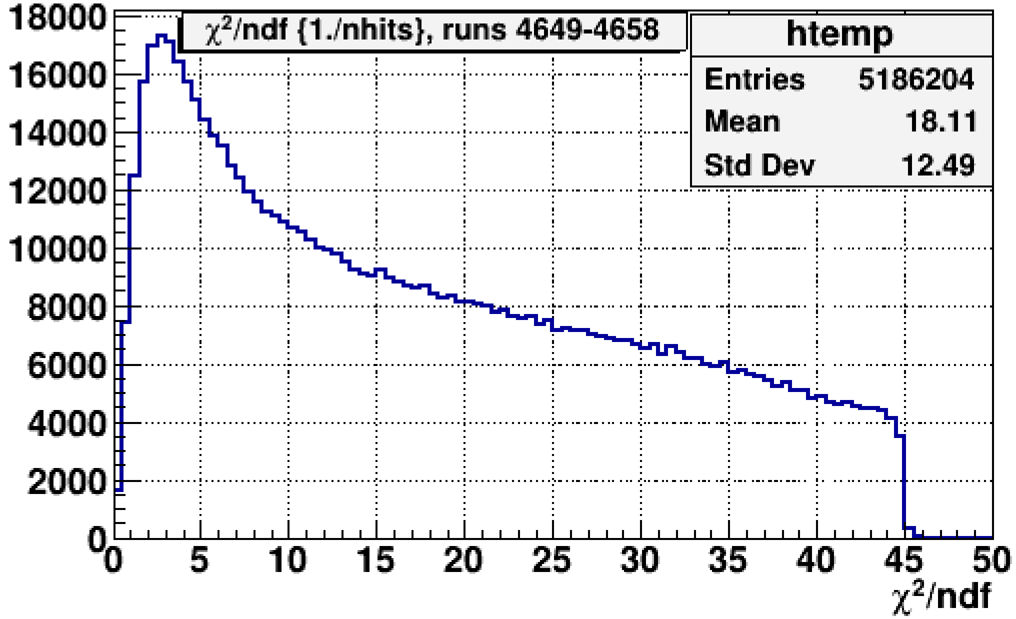
Wo track from PV cut



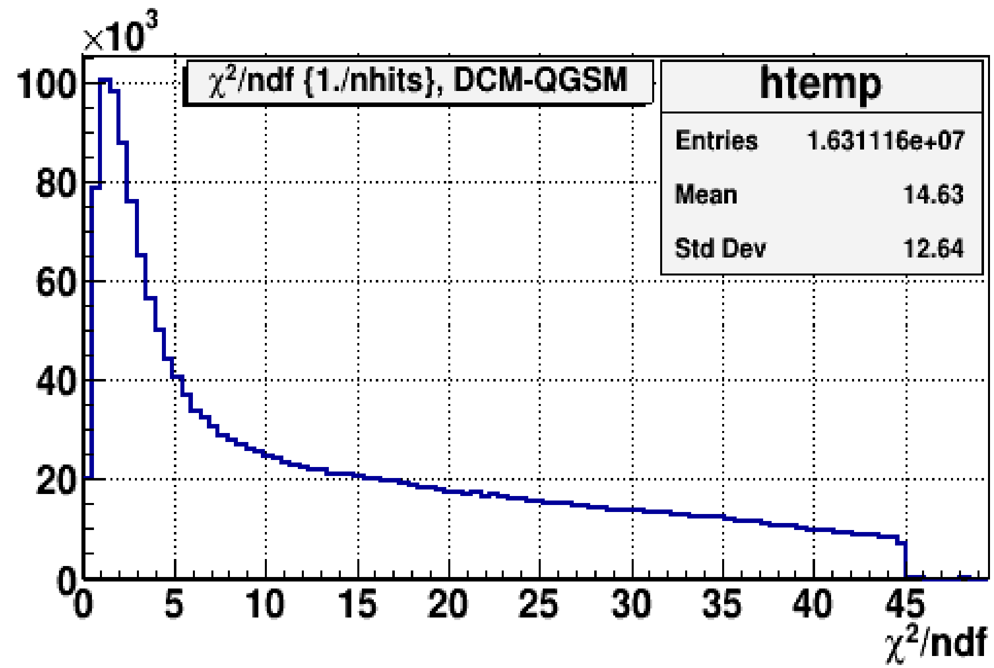
- DCA with cut narrower than without cut
- Tracks with $0<\chi^2/NDF<3.5^2$ are included in PV

χ^2/ndf Data vs MC for unidentified tracks

Data



DCM-QGSM

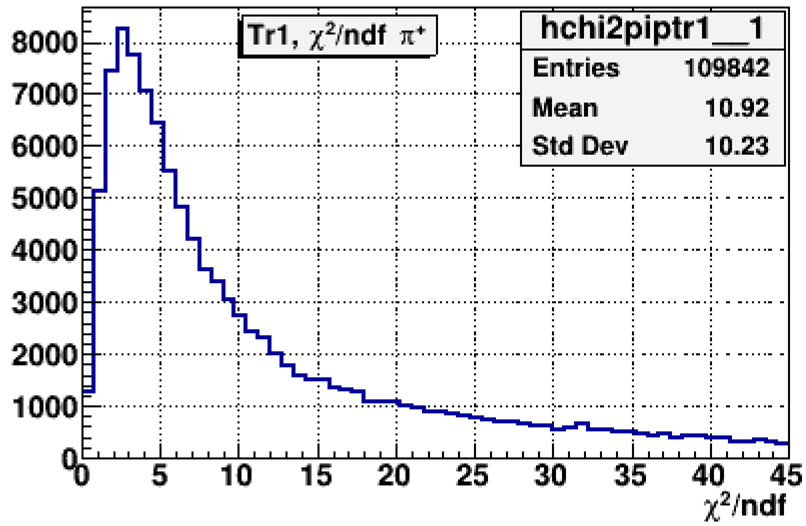


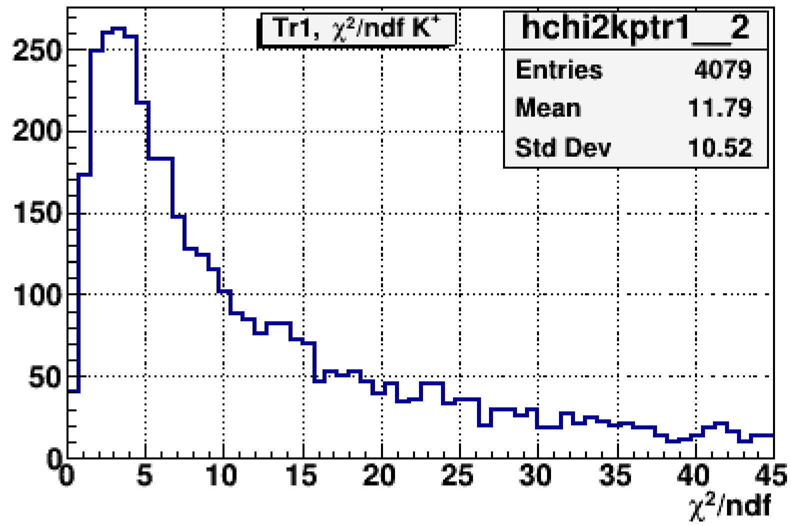
- χ^2/ndf for Data significantly wider than for MC

Cuts for unidentified tracks

- nSiHits>1 & nGemHits>2

χ^2/ndf Data for identified tracks





- χ^2/ndf for identified tracks significantly narrower than for unidentified tracks