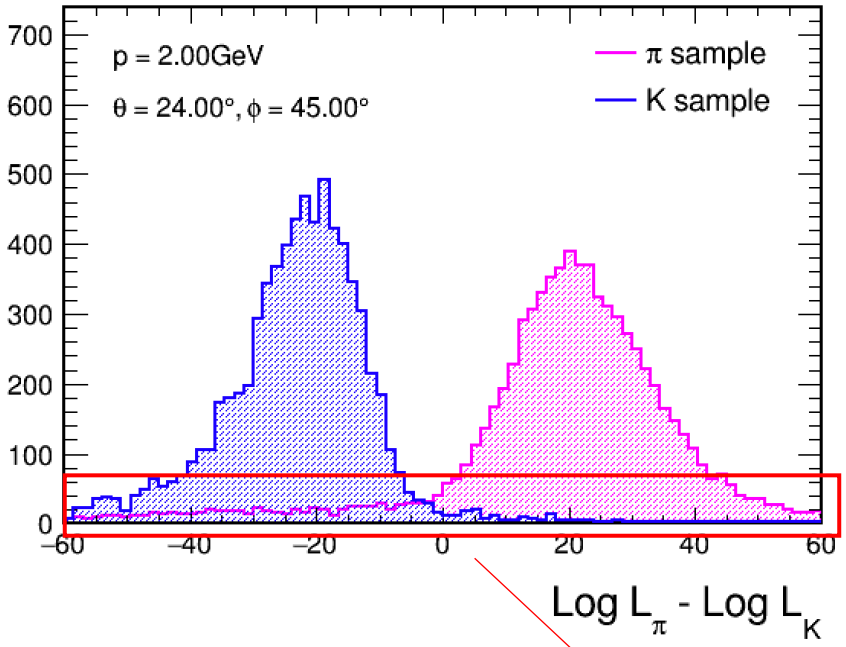
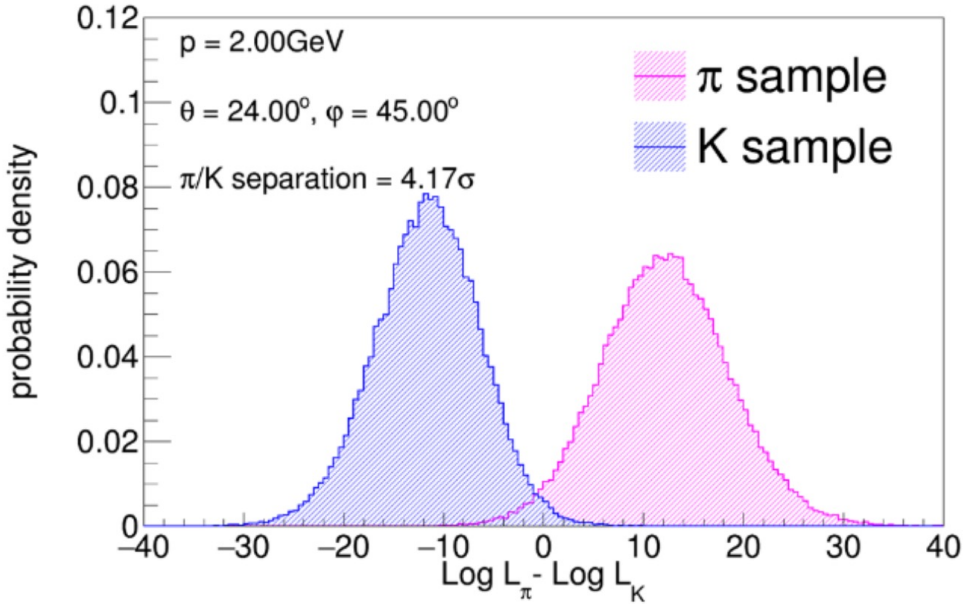
$$\mathcal{L}_h = \prod_{i=1}^{n} f_h\left(TOF_i^h\right), \quad \text{i for each detected photon}$$



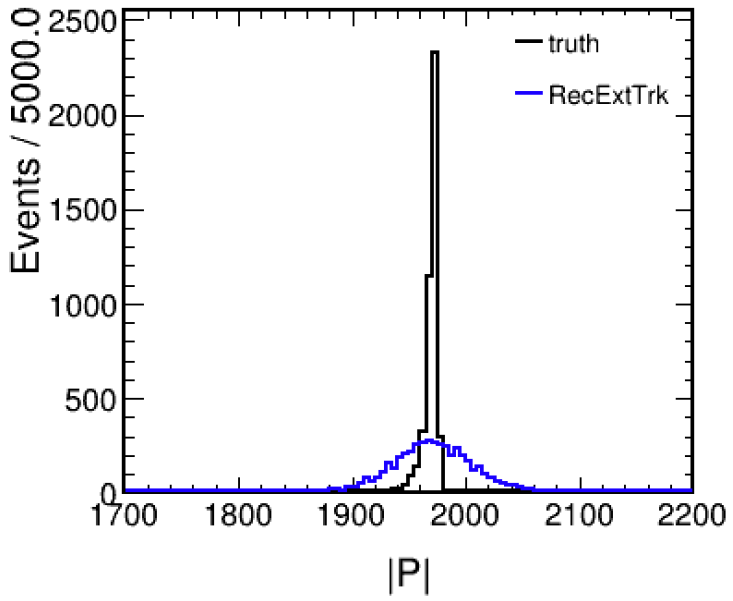
From Binbin

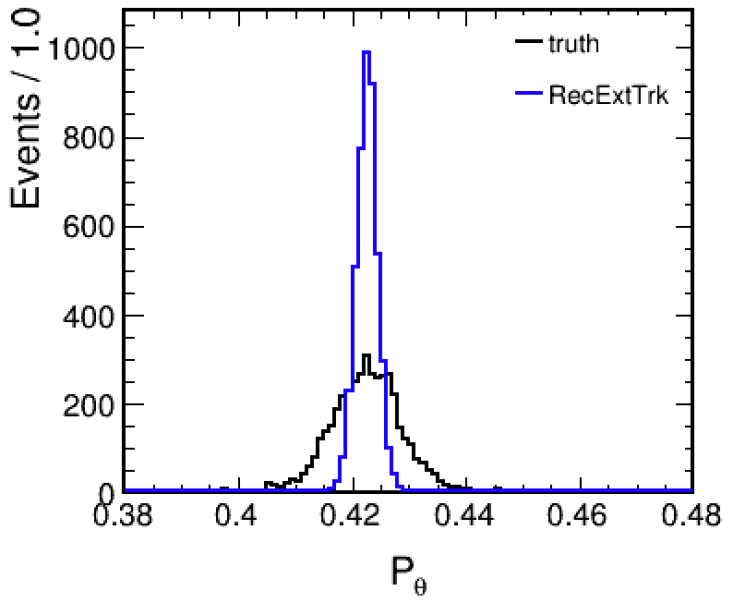


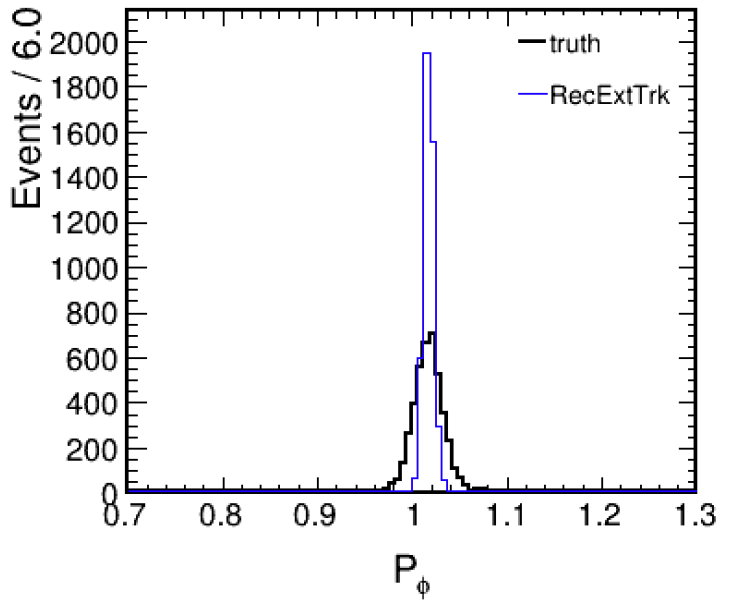
$$logL = \log\left(\frac{1}{\sqrt{2\pi\sigma}} e^{-\frac{\left(TOF_{hypo}-TOF\right)^2}{2\sigma^2}} + backped\right)$$

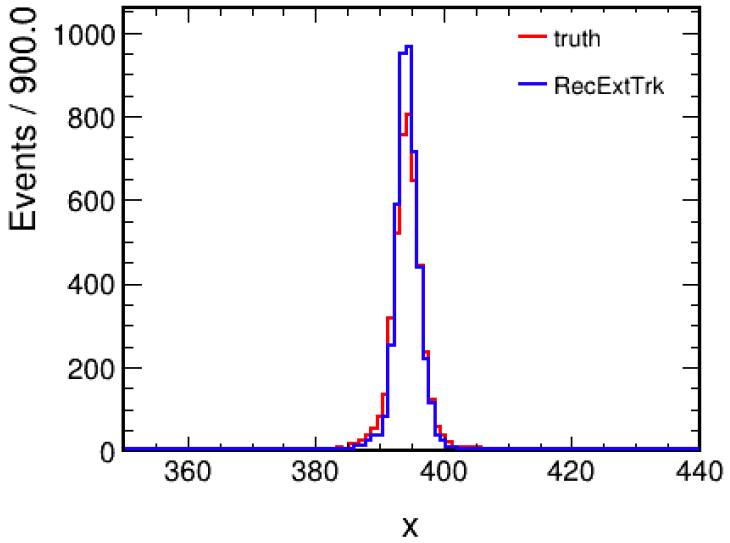
To suppress the influence from time resolution

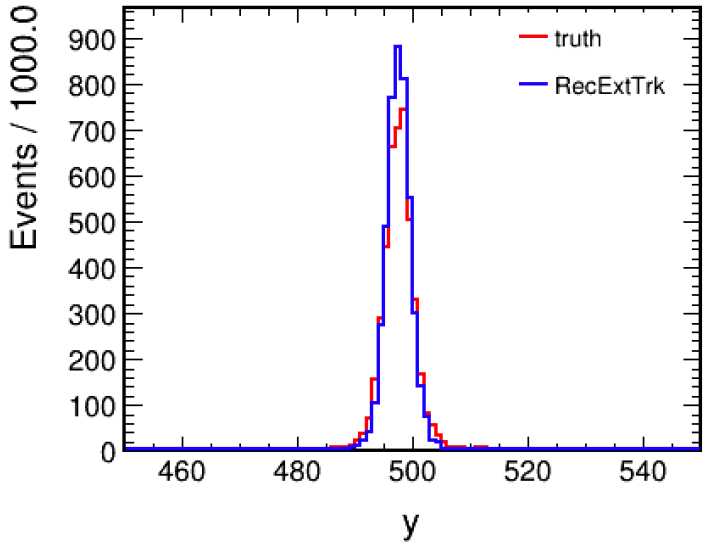
Comparison between truth & RecExtTrk in DTOF

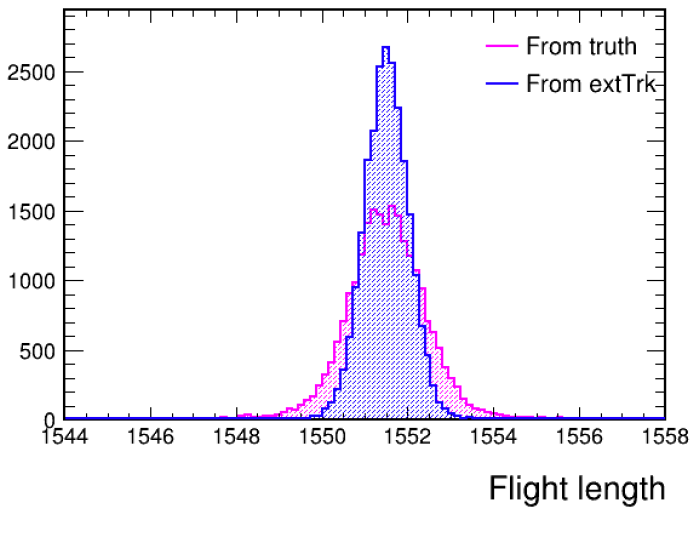












With $\sigma_{TTS}\sim 0.07ns$, without σ_{T_0}

$$TOF = T - \boxed{TOP}^{\vec{r},\vec{p}} - T_0$$

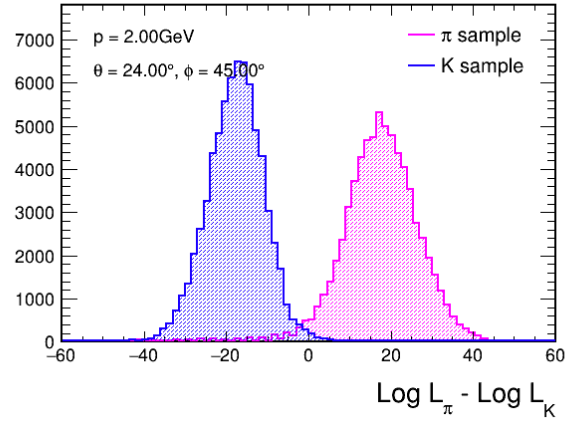
TrkFlyLength

$$logL(TOF, \boxed{TOF_{hypo}})$$

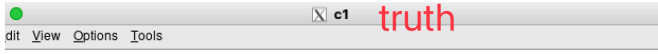
Remove the events with decay and other interactions.

	truth	Tru $\vec{r},\vec{p}$+ext FlyL	Tru FlyL+ext $\vec{r},\vec{p}$	ExtTrkRec
Separation/σ	4.88	4.81	4.35	4.36

May $\vec{r},\vec{p}$ from ExtTrkRec influence larger

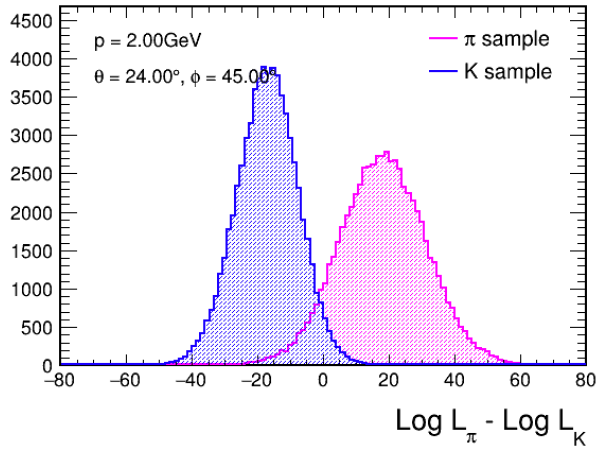


With $\sigma_{TTS}\sim 0.07ns$ + $\sigma_{T_0}\sim 0.04ns$



	truth	Tru $\vec{r},\vec{p}$+ext FlyL	Tru FlyL+ext $\vec{r},\vec{p}$	ExtTrkRec
Separation/σ	3.17	3.05	3.03	3.05

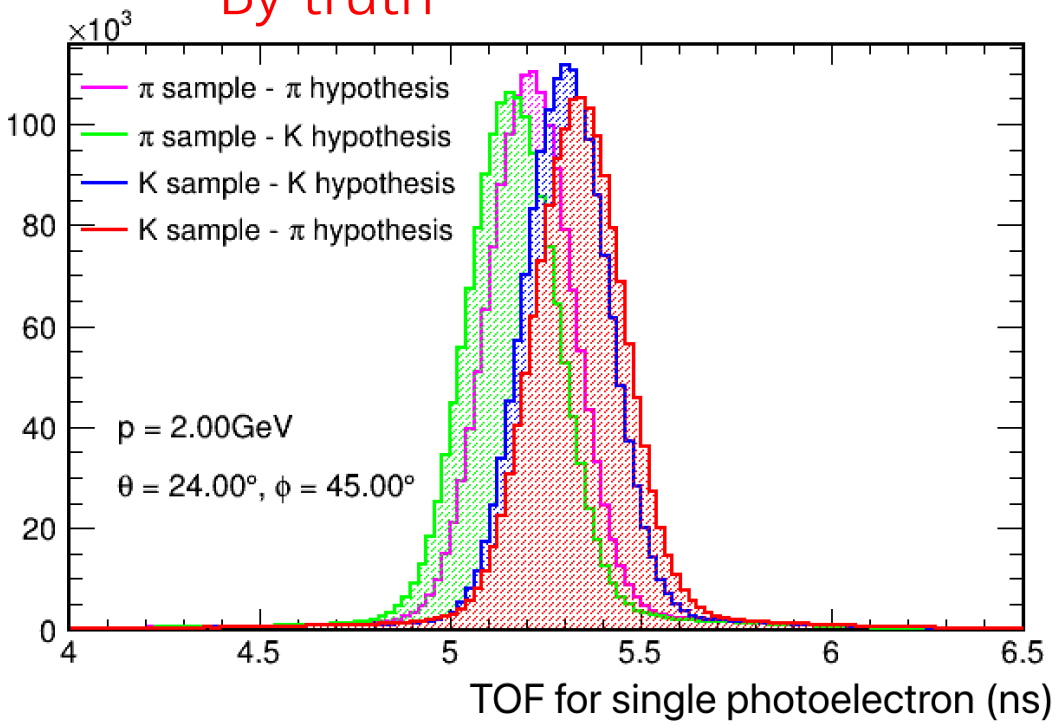
<<4.17σ

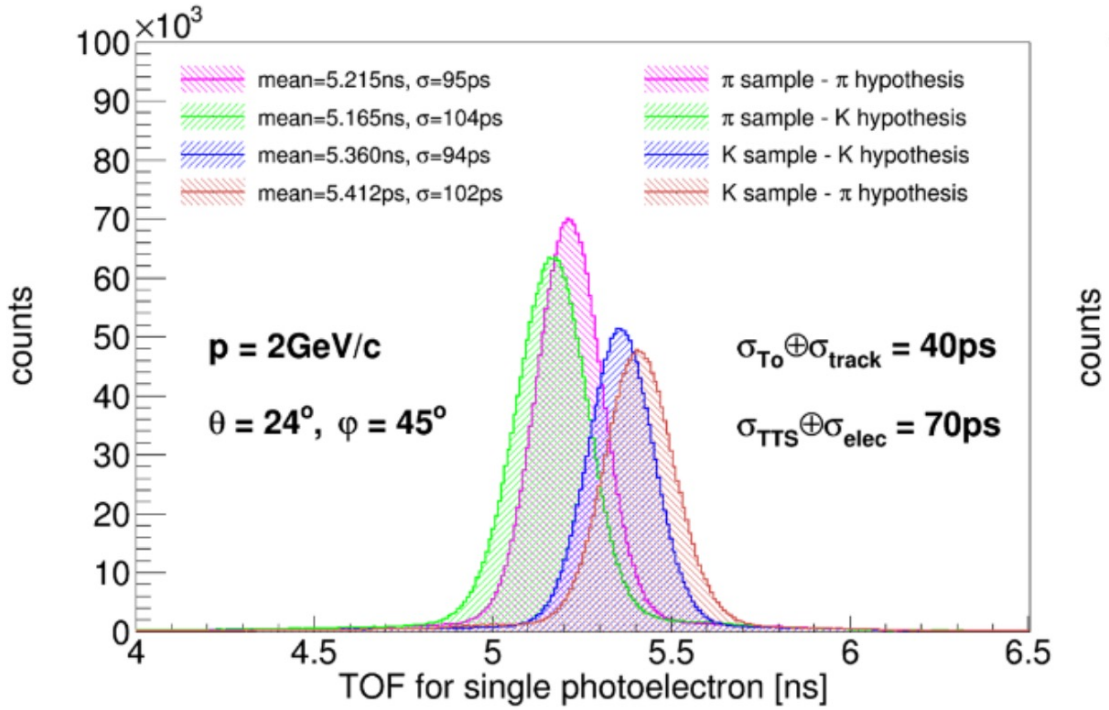


σ_{TTS}~0.07ns & σ_{T_0}~0.04ns

$$TOF = T - TOP - T_0$$

By truth





	$\pi - hypo\ \pi$		$\pi - hypo\ K$		$K - hypo\ K$		$K - hypo\ \pi$	
Mean/ns	5.213	5.215	5.165	5.165	5.306	5.360	5.340	5.412
Sigma/ps	115	95	120	104	113	94	121	102

Up to do

- Let $\sigma_{TTS} = 0$ & $\sigma_{T_0} = 0$ to get RecTOF distribution
- Get the distribution of $LOP_{truth} - LOP_{rec}$
- Multi-Tracks identification

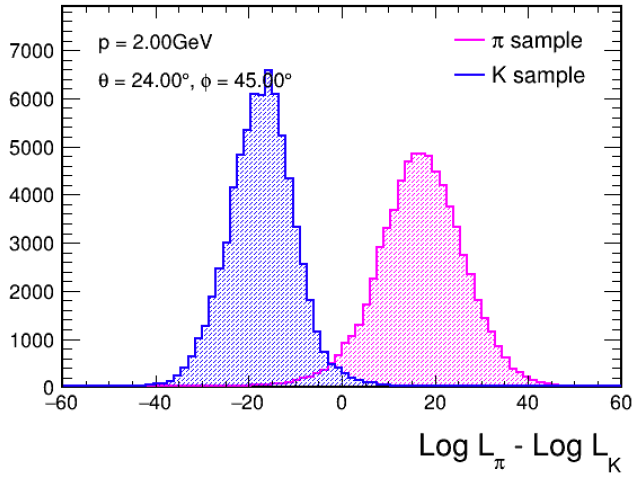
Back up

```
[ytfeng@stc102 get_for]$rt
[root [0] sqrt(115*115 - 95*95)
 (double) 64.807407
[root [1] sqrt(113*113-94*94)
 (double) 62.713635
[root [2] sqrt(120*!20-104*104)
 (double) -nan
[root [3] sqrt(120*120-104*104)
 (double) 59.866518
[root [4] sqrt(121*121-102*102)
 (double) 65.092242
[root [5] .q
```

With σ_{TTS}~$0.07ns$, without σ_{T_0}

Only remove the samples from decay

By ExtTrkRec ~ 3.88σ

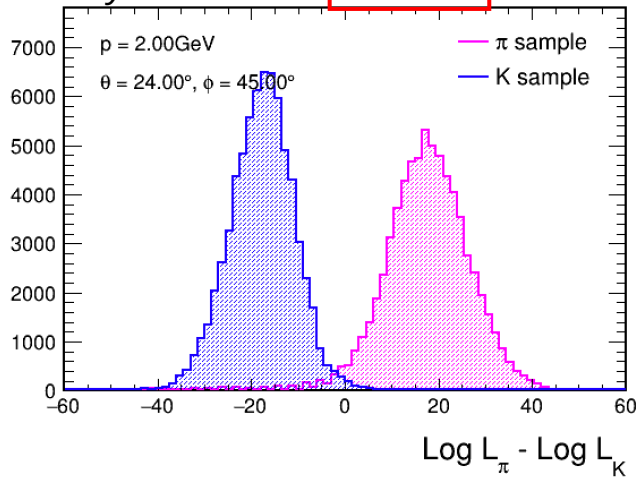


$$TOF = T - \overbrace{TOP}^{\vec{r},\vec{p}} - T_0$$

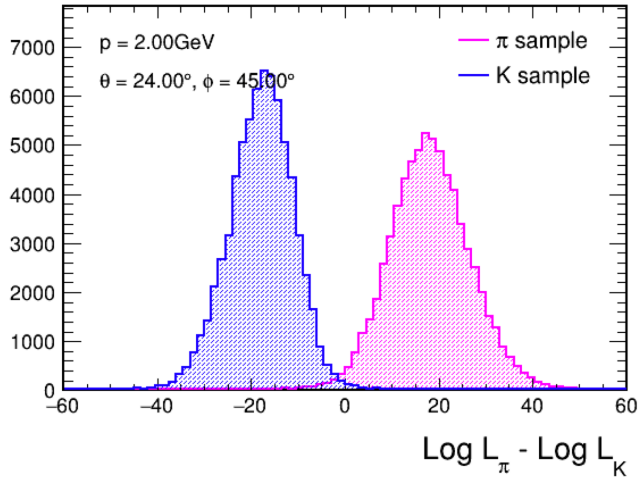
$$logL(TOF, TOF_{hypo})$$

TrkFlyLength

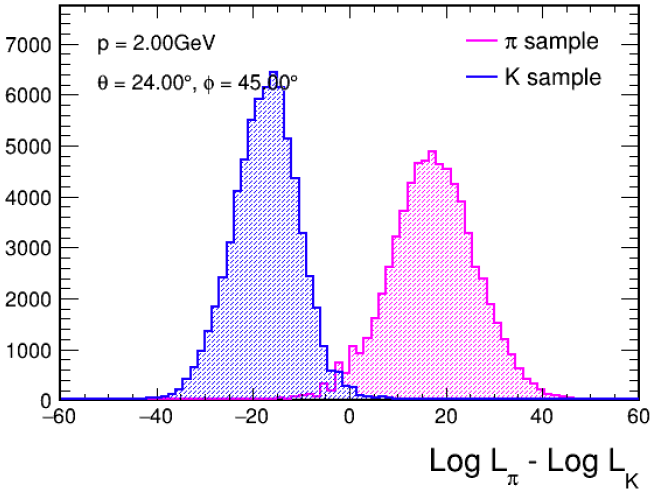
By Truth ~ 4.17σ



TrkFlyL from extTrkRec & $\vec{r},\vec{p}$ from truth ~ 4.46σ

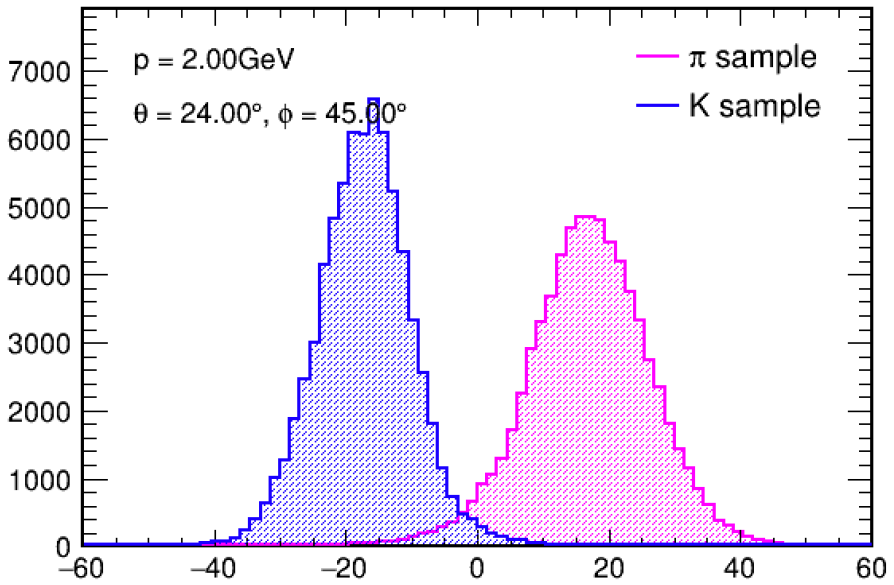


TrkFlyL from truth & $\vec{r},\vec{p}$ from ExtTrkRec ~ 4.13σ



With σ_{TTS}~0.07ns, without σ_{T_0}; Used info from ExtTrkRecAlg

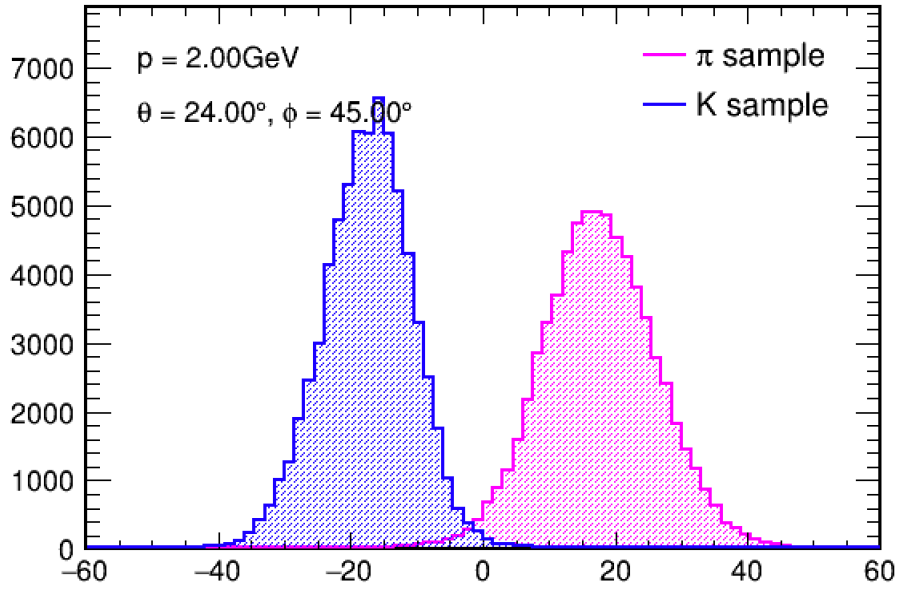
Remove the samples from decay



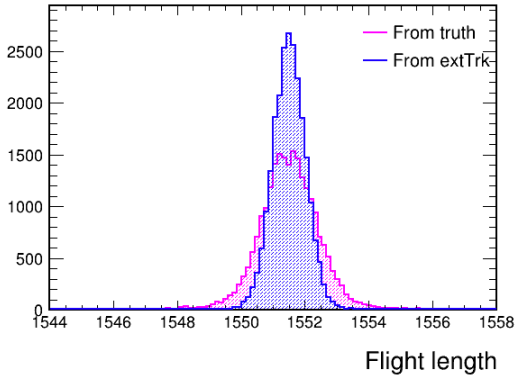
Separation ~ 3.88σ

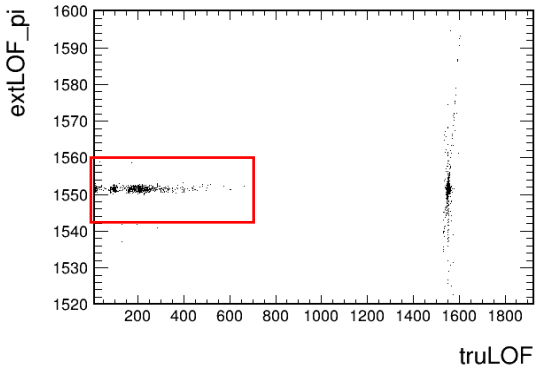
Trks with strong interaction or othrs.

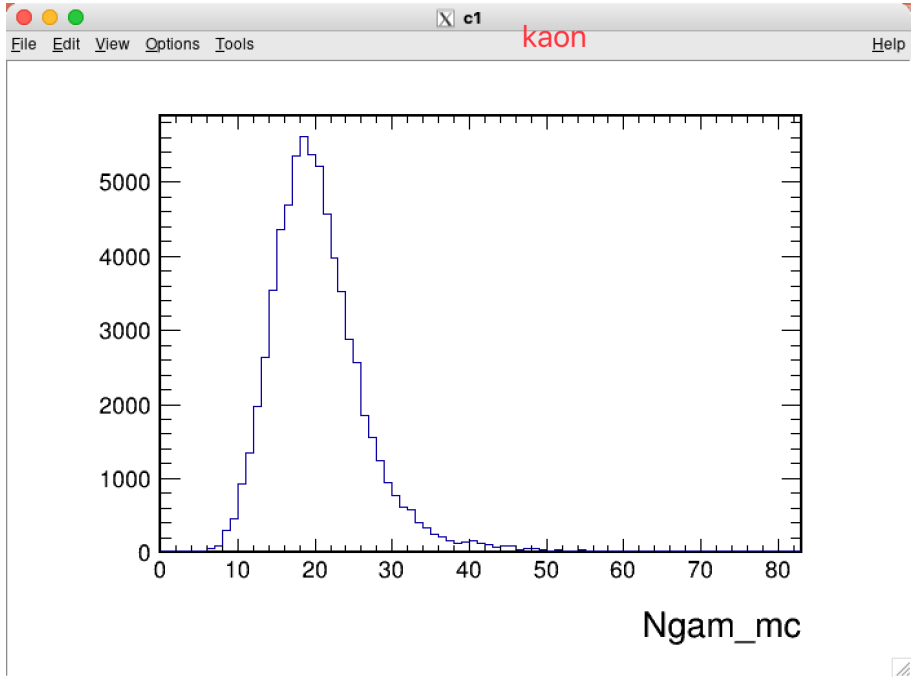
But the type didn`t changed



Separation ~ 4.36σ



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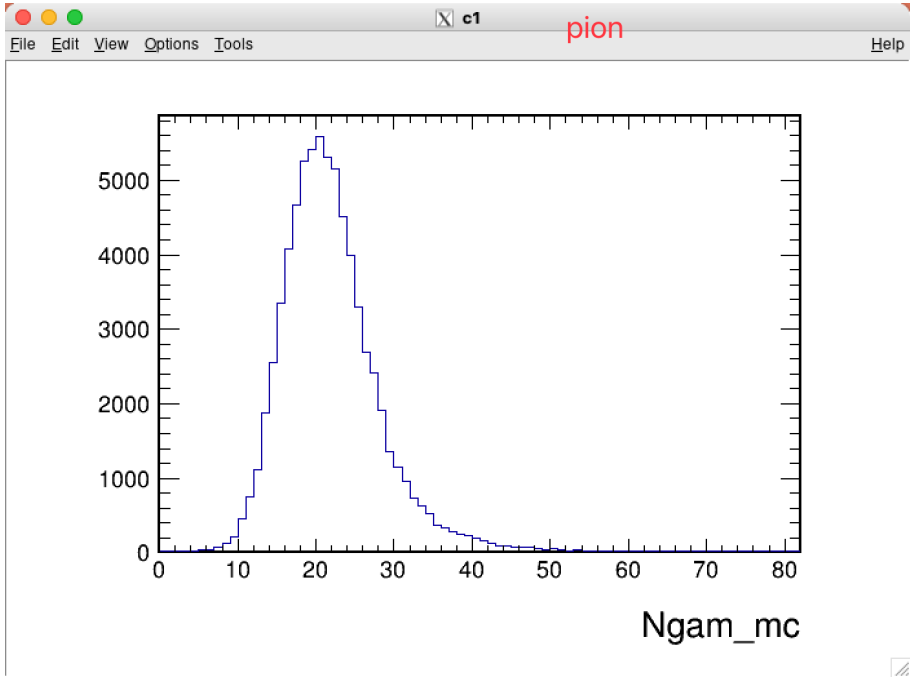
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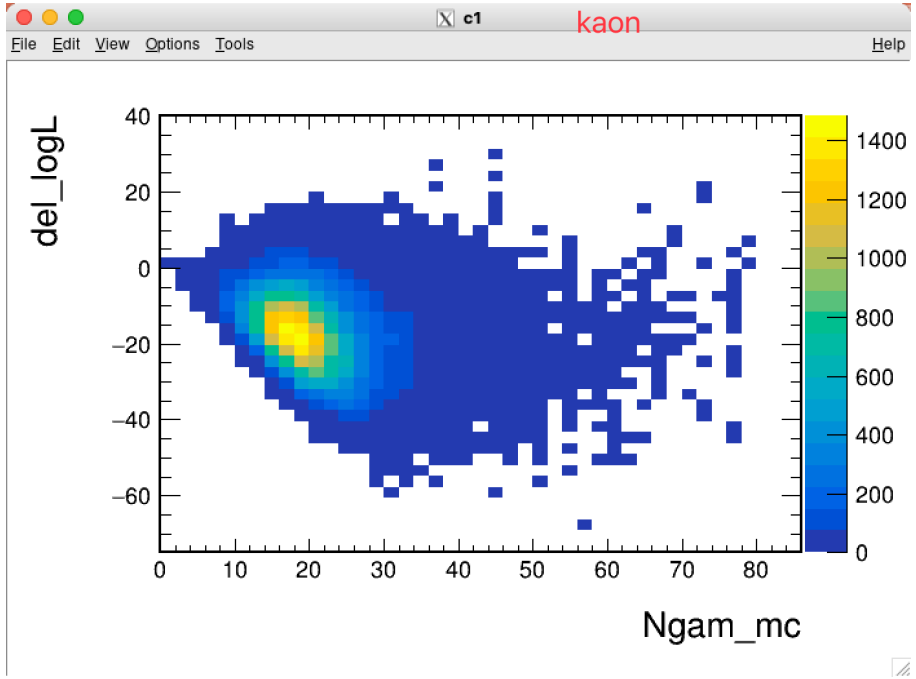
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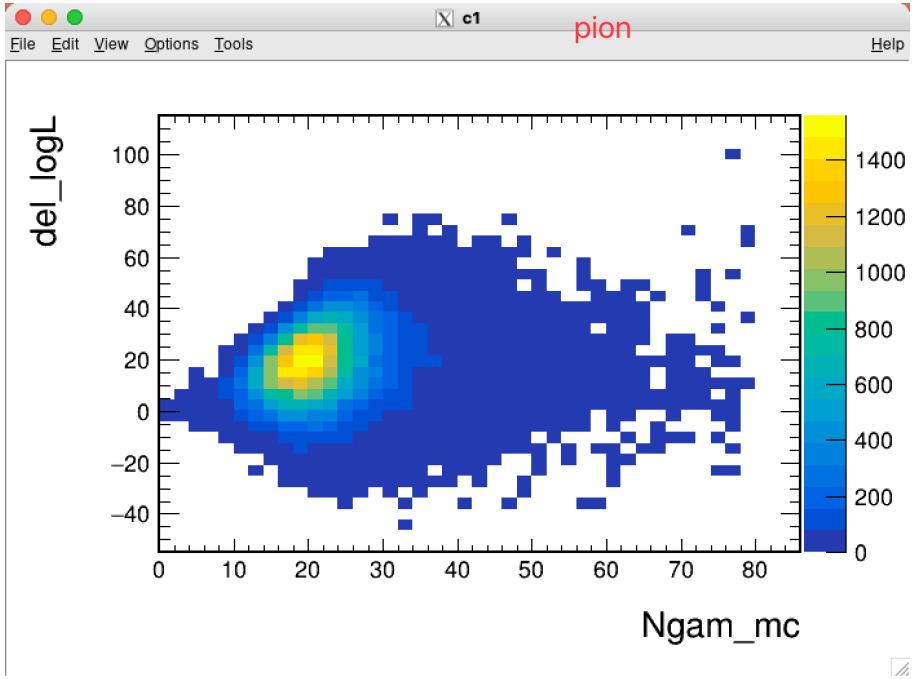
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