dRICH update

Alessio Del Dotto

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New PID strategy

1) $IRT \rightarrow (\theta_C^M | track, rad)$
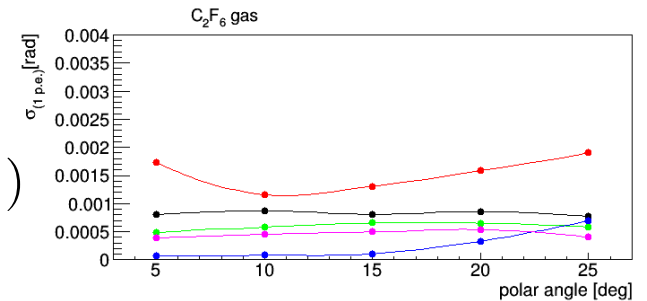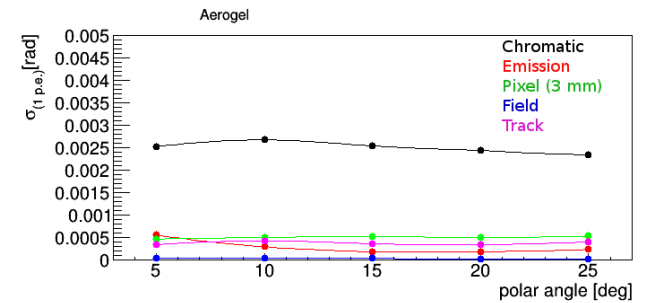
2) Each photon assigned to one track only, or bk

$$P_{track,rad}^{photon} = Gauss(\theta_C^M | \theta_C^T, \sigma_{\theta_C}) * \sum Pois(N_{pe}^M + 1, \langle N_{pe} \rangle)$$

$$P_B = C * \sum Pois(N_{pe}^B + 1, \langle N_{pe}^B \rangle)$$

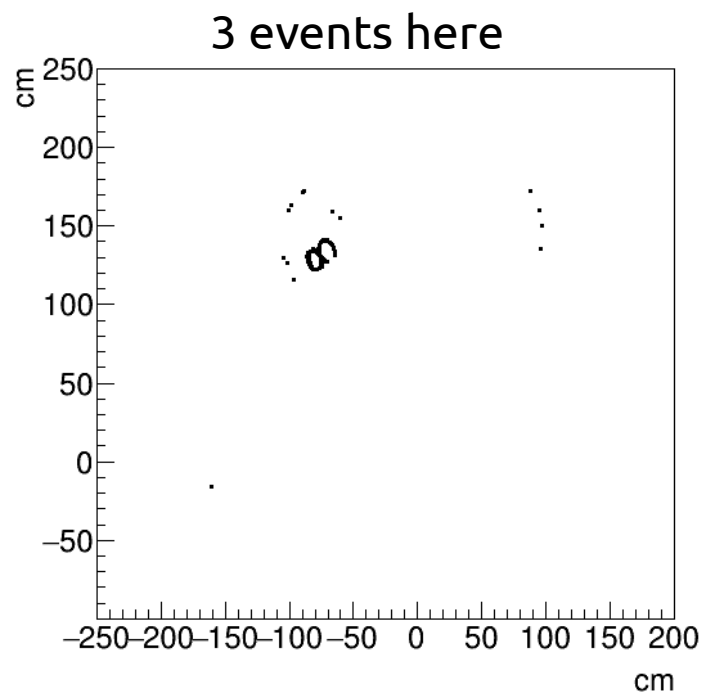3) The max L privide the most probable PID configuration of the entire event

$$L = \sum_{track,rad} ln(Gauss(\theta_C^M | \theta_C^T, \sigma_{\theta_C}/\sqrt{N_{pe}}) * \sum Pois(N_{pe}^M + 1, \langle N_{pe} \rangle)) + ln(C^{N_{pe}^B} * \sum Pois(N_{pe}^B + 1, \langle N_{pe}^B \rangle))$$
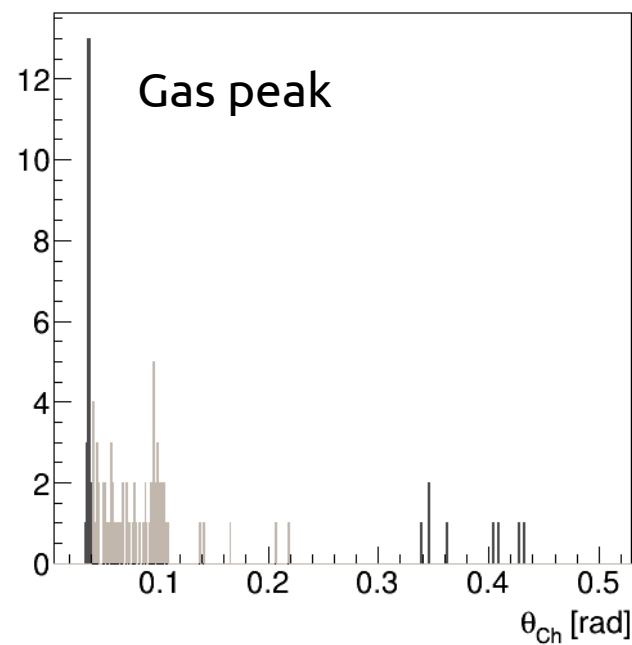
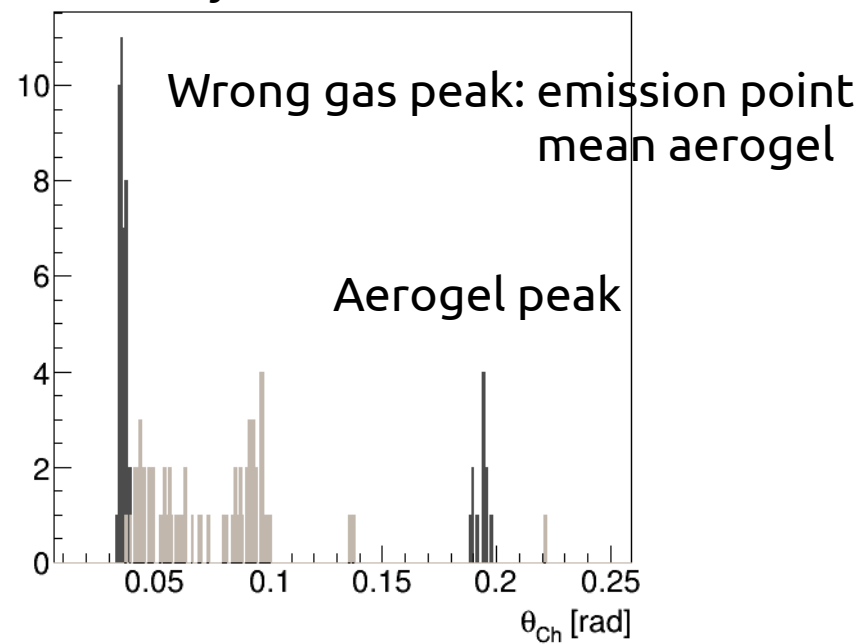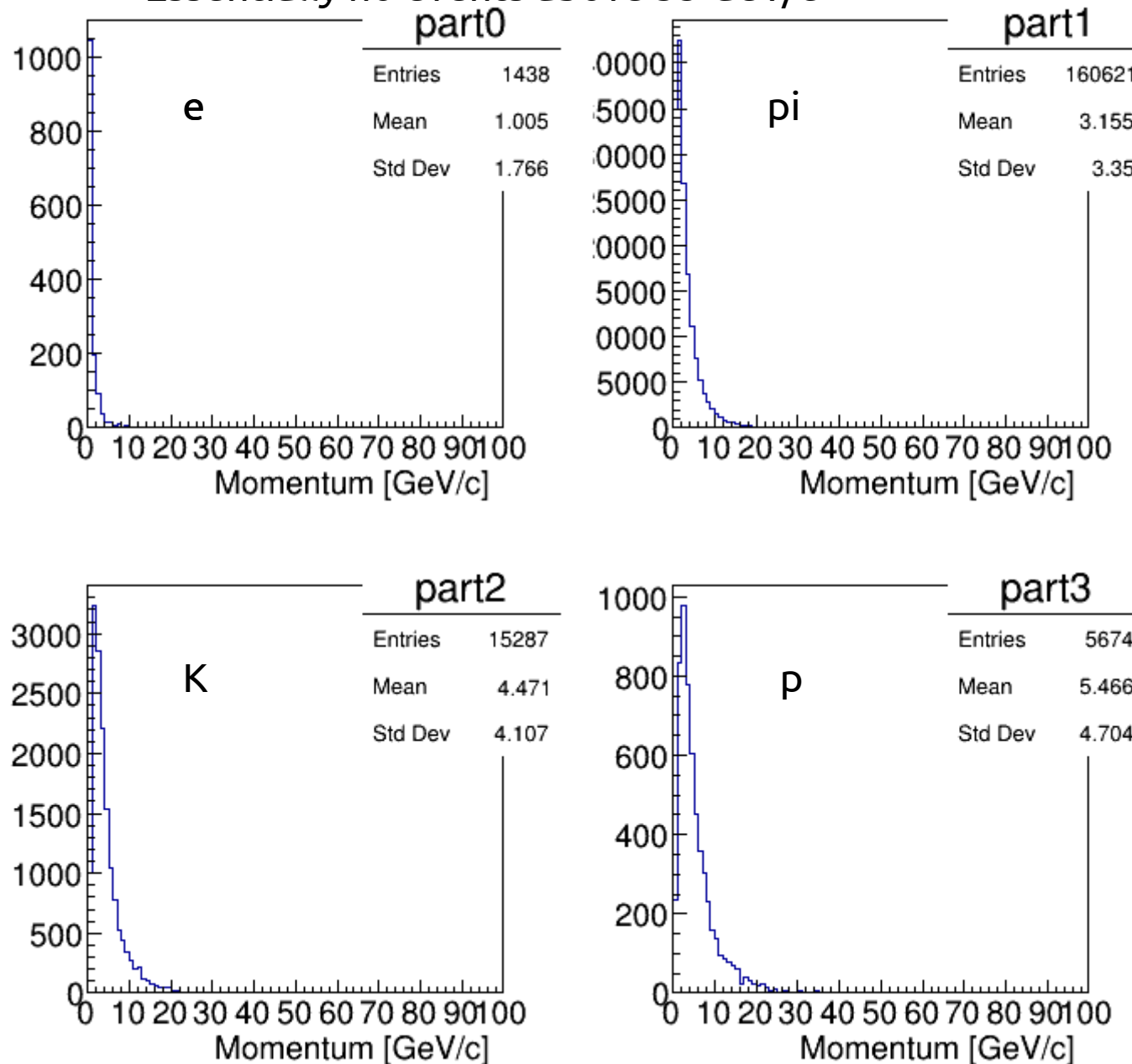This is an IRT event based reconstruction now!

Draft paper under progress::
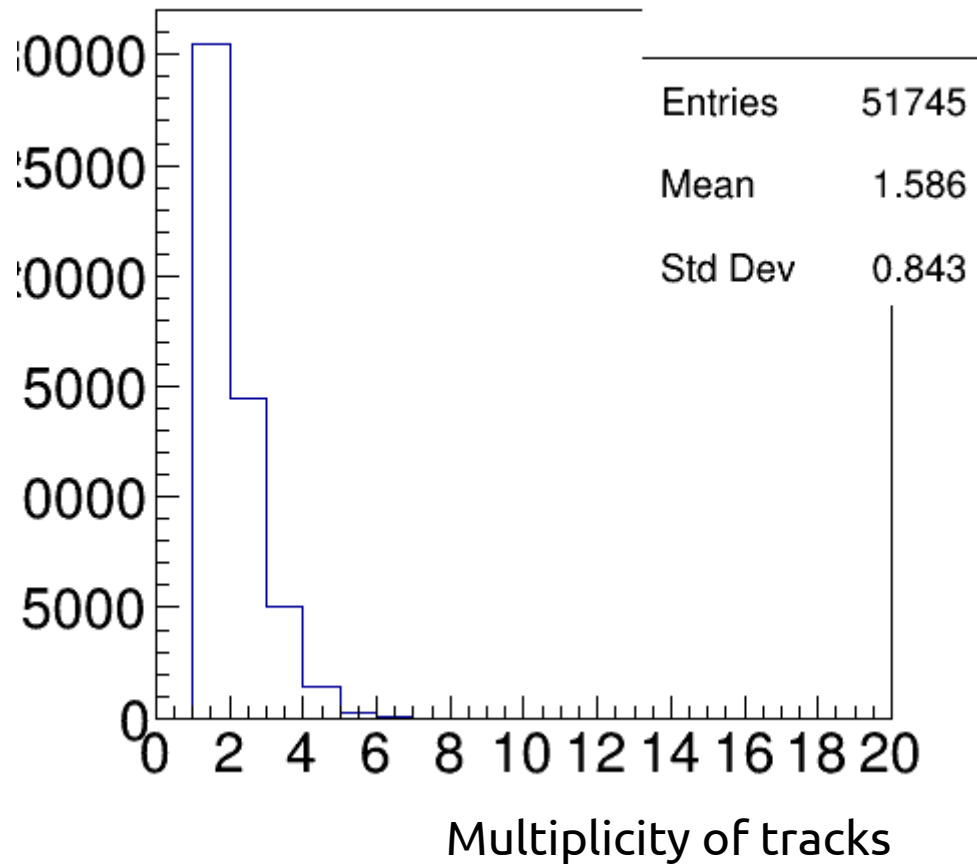https://www.overleaf.com/read/fpvtwtpsknsb
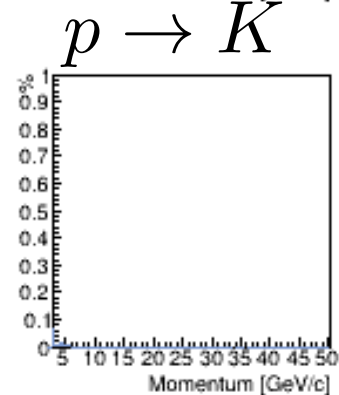

2

Black histo belongs
to just one selected track
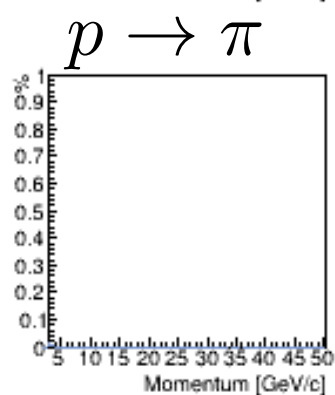
3 events here

Wrong gas peak: emission point
mean aerogel

Aerogel peak

θ_{Ch} [rad]

Gas peak

θ_{Ch} [rad]

90000 events processed
Essentially no events above 35 GeV/c

part0	
Entries	1438
Mean	1.005
Std Dev	1.766

e

part1	
Entries	160621
Mean	3.155
Std Dev	3.35

pi

part2	
Entries	15287
Mean	4.471
Std Dev	4.107

K

part3	
Entries	5674
Mean	5.466
Std Dev	4.704

p

Momentum [GeV/c]

Field off in the simulation!

Entries	51745
Mean	1.586
Std Dev	0.843

Multiplicity of tracks

$e \rightarrow e$ $e \rightarrow \pi$ $e \rightarrow K$ $e \rightarrow p$

$\pi \rightarrow e$ $\pi \rightarrow \pi$ $\pi \rightarrow K$ $\pi \rightarrow p$

$K \rightarrow e$ $K \rightarrow \pi$ $K \rightarrow K$ $K \rightarrow p$

$p \rightarrow e$ $p \rightarrow \pi$ $p \rightarrow K$ $p \rightarrow p$
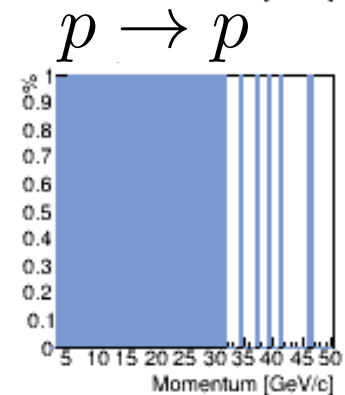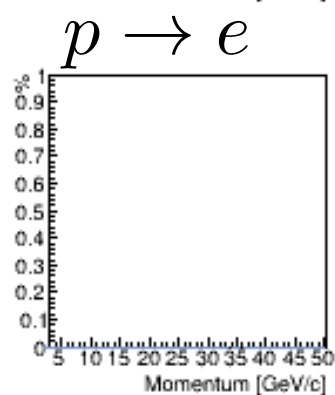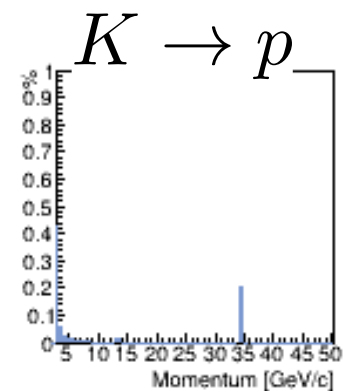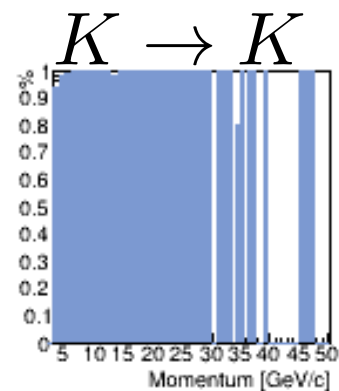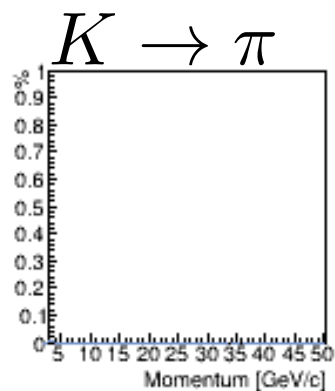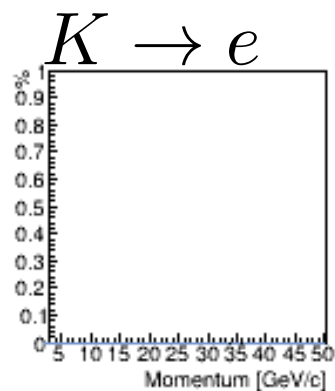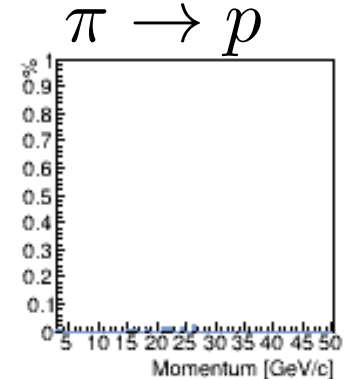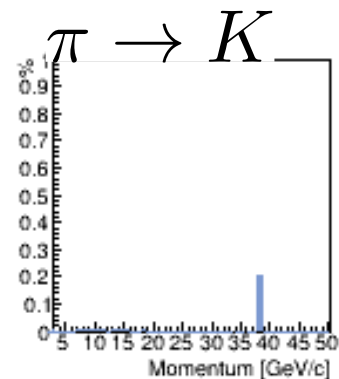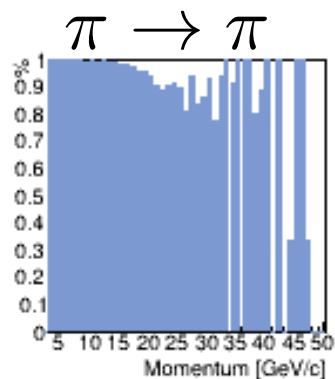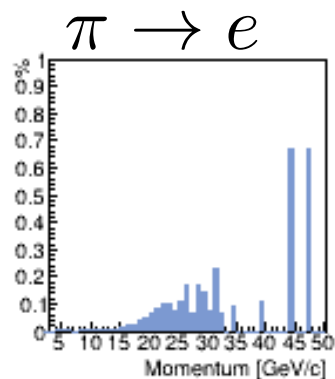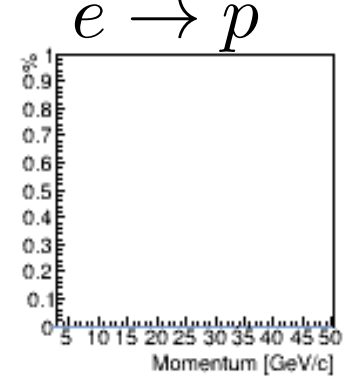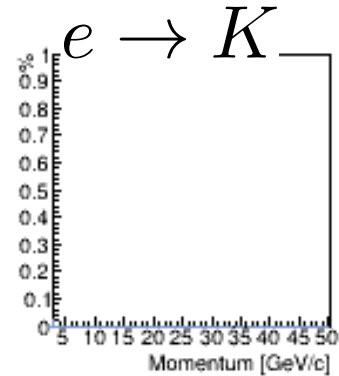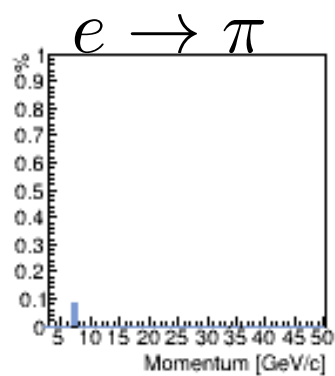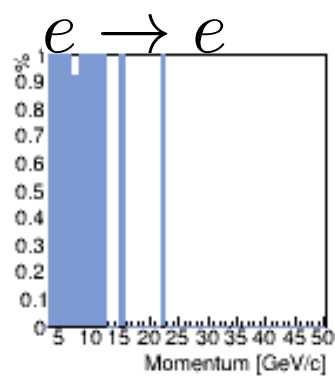
Comments & to do

The dRICH works well, as expected by design

Working on …

- Data with field on under running
- dRICH report & publication draft