Third Production –Part 1 Analysis

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3rd Production (Events ~ 15M)

EVENT level

triggerId : 200001, 200003, 200013
Primary vertex position along the beam axis :
|zvertex| < 10 cm
Resolution of the primary vertex position along the beam axis:
$|\sigma_{zvertex}|$< 200μm

TRACKS level

Number of hits in the vertex detectors:
SiliconHits>1
Momentum of tracks
$P_\pi+P_K$ > 1.5 GeV/c
Ratio TPC hits Fitted/Possible > 0.51
Pseudo-rapidity : **|η|<1.2**
dEdxTrackLength>40 cm
DCA to Primary vertex (transverse),
DCA_{xy}< .2 cm
Radius of first hit on track :
< 9 cm if number of silicon hits =2
< 13 cm else

D^0 candidate
$|y(D^0)|<1$
$|\cos(\theta^*)|<0.8$

DECAY FIT level

Probability of fit >0.01 && |sLength|<.1cm

Particle ID : ndEdx : **$|n\sigma_K|<2.5$, $|n\sigma_\pi|<2.5$**

Cuts used in Pico file

$|\mathrm{Cos}(\theta^*)|<0.6$

$|\mathrm{Rapidity}|<0.5$

$DCA_{XY} < 0.1$ cm

SiHits > 2

$|n\sigma_{K,\pi}| < 2$

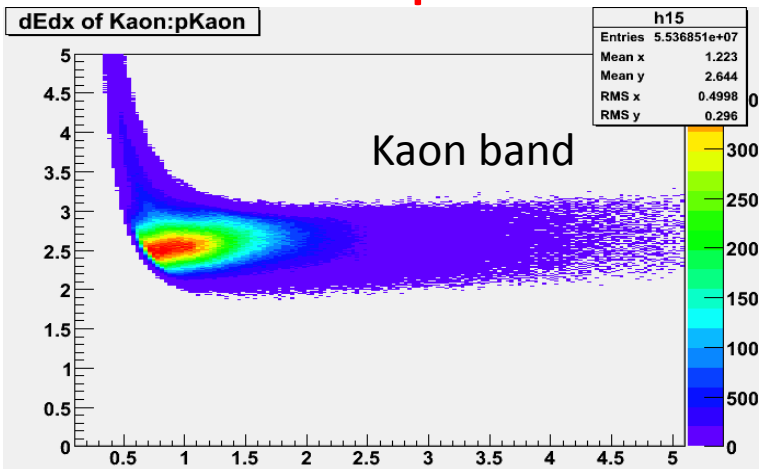
$|\mathrm{EtaD0}| < 1.85$

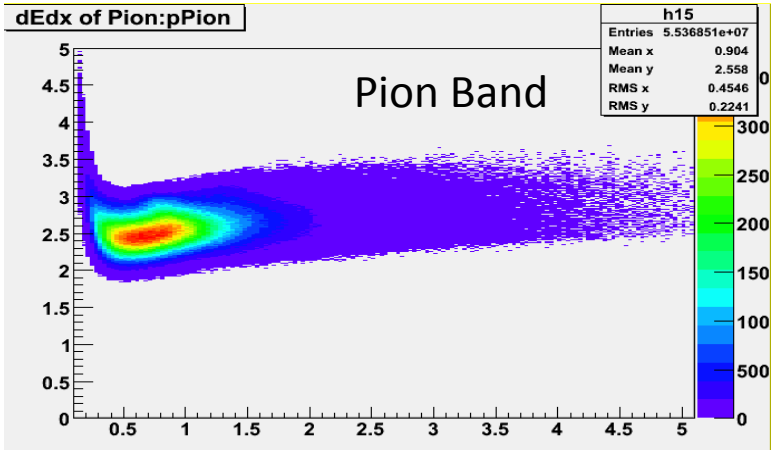
Probability > 0.1

Diagnostic QA histograms

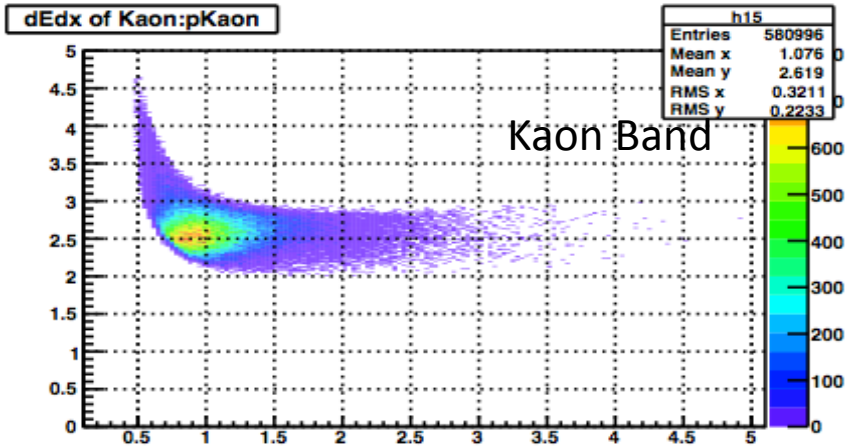
dE/dx

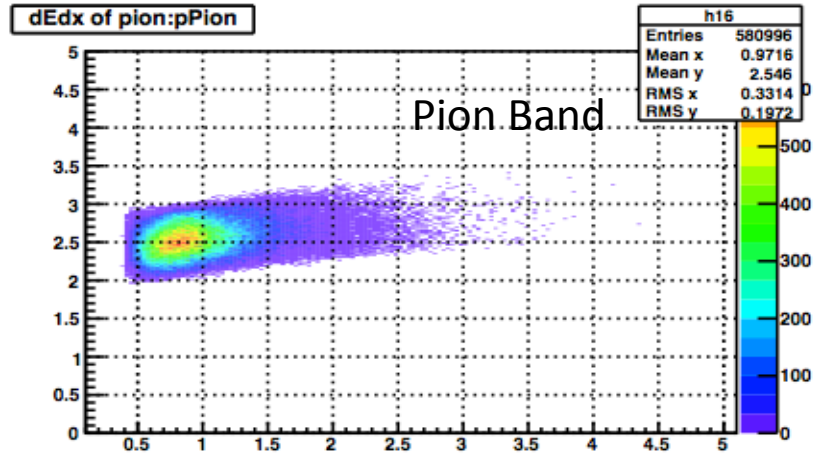
Before pico cuts





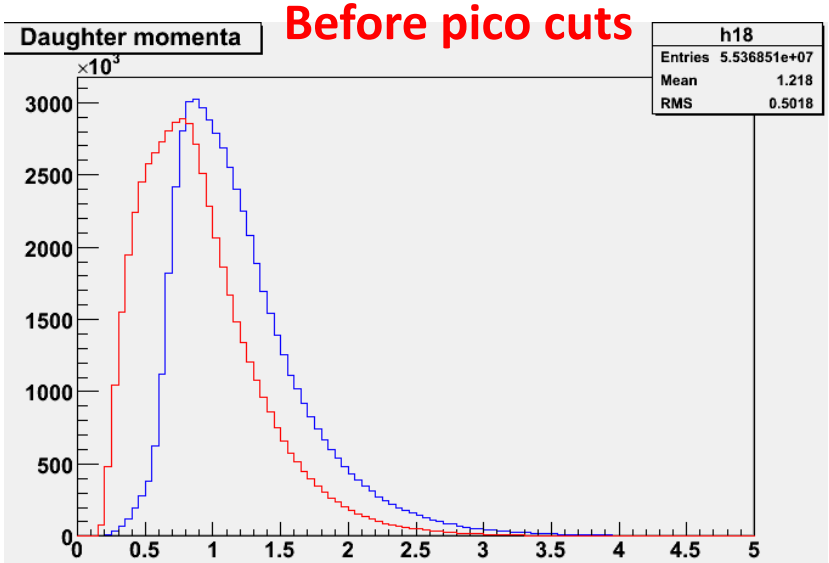
After cuts

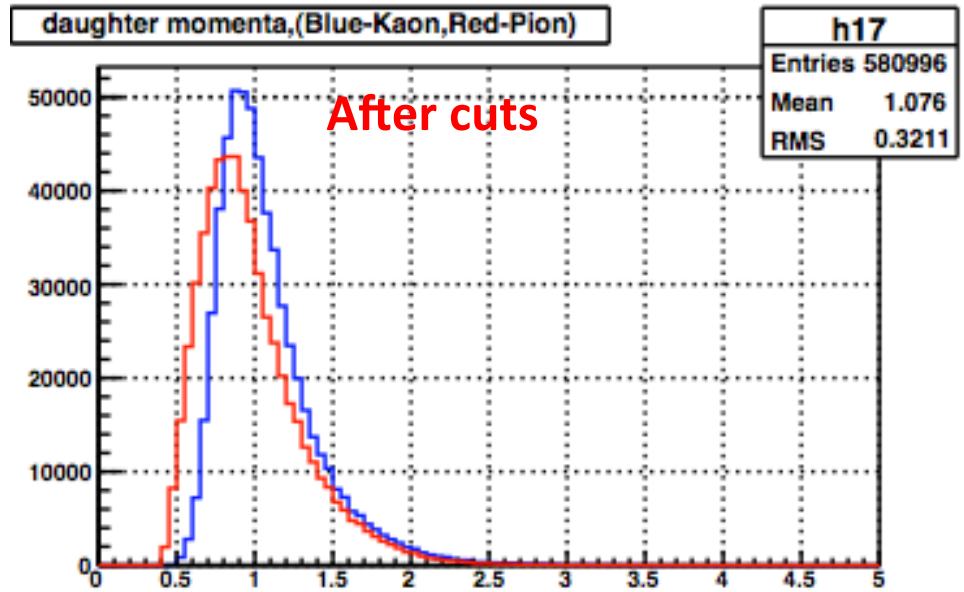


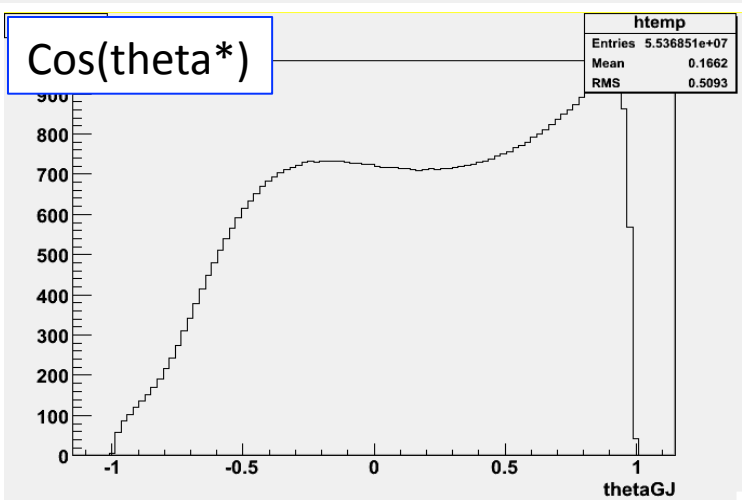


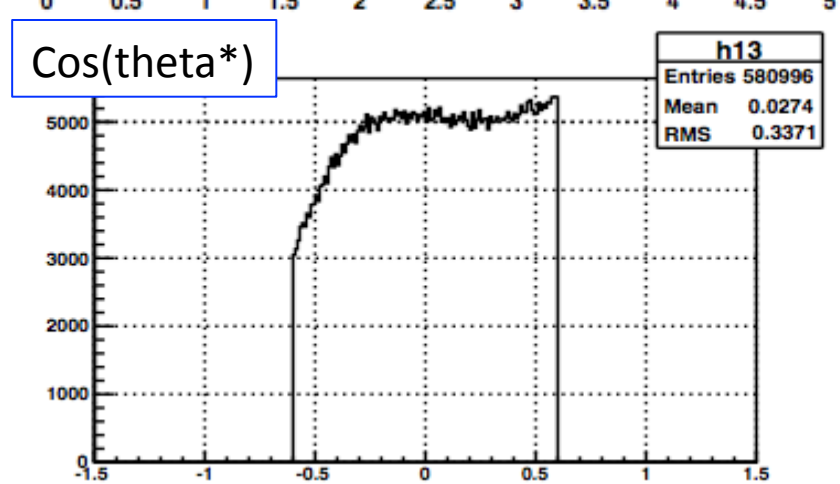
More QA plots are at: http://www.star.bnl.gov/~jai2006/?dir=QA_DayByDay/THIRD_PROD/

Diagnostic QA histograms







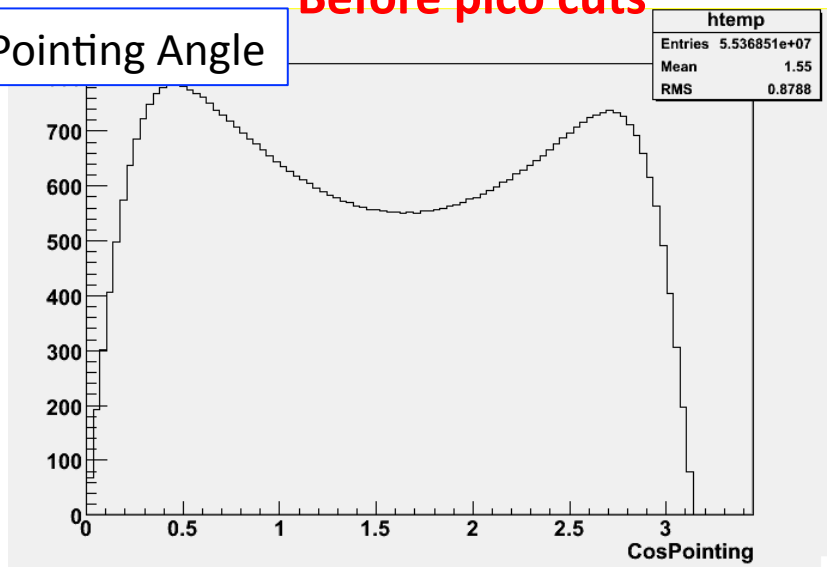


More QA plots are at: http://www.star.bnl.gov/~jai2006/?dir=QA_DayByDay/THIRD_PROD/

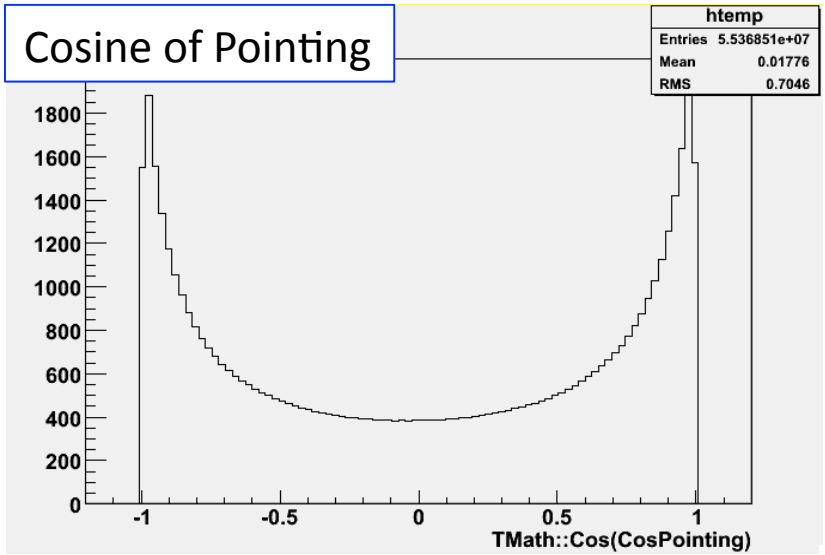
Diagnostic QA histograms

Before pico cuts

Pointing Angle

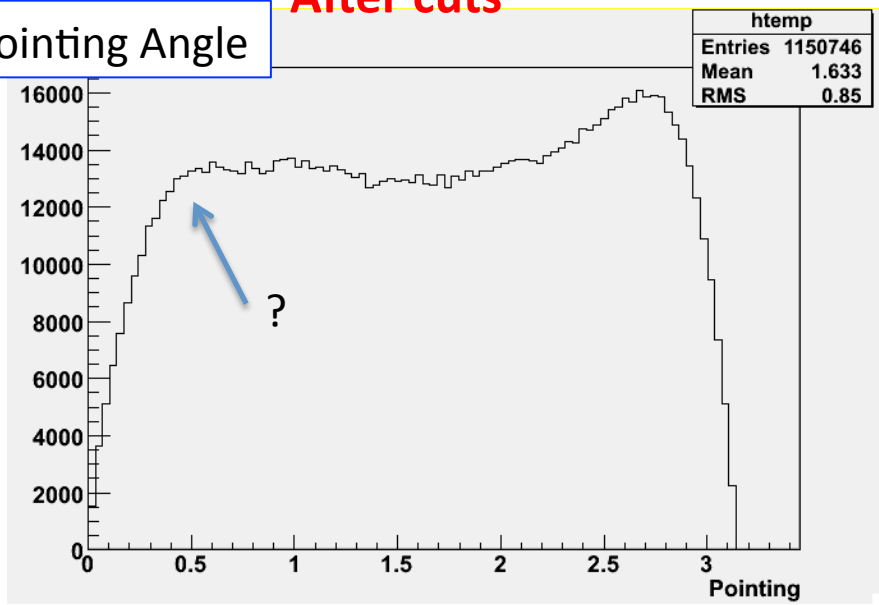


Cosine of Pointing

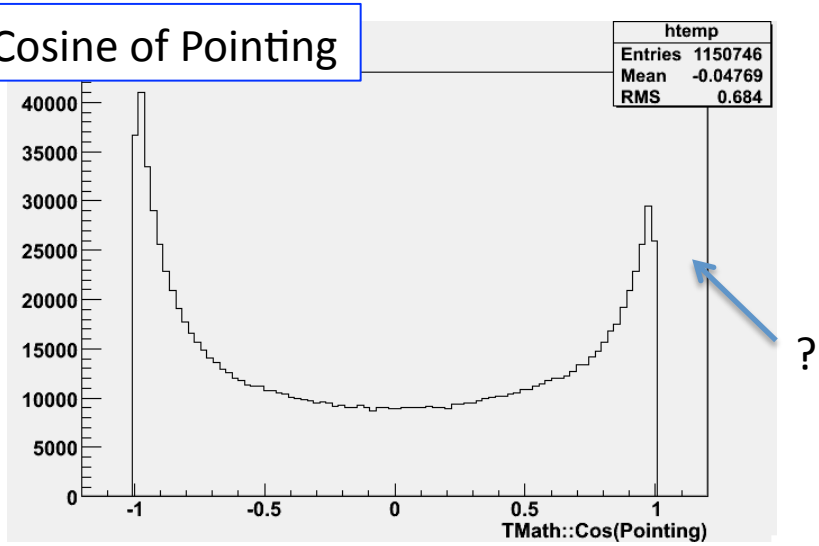


After cuts

Pointing Angle

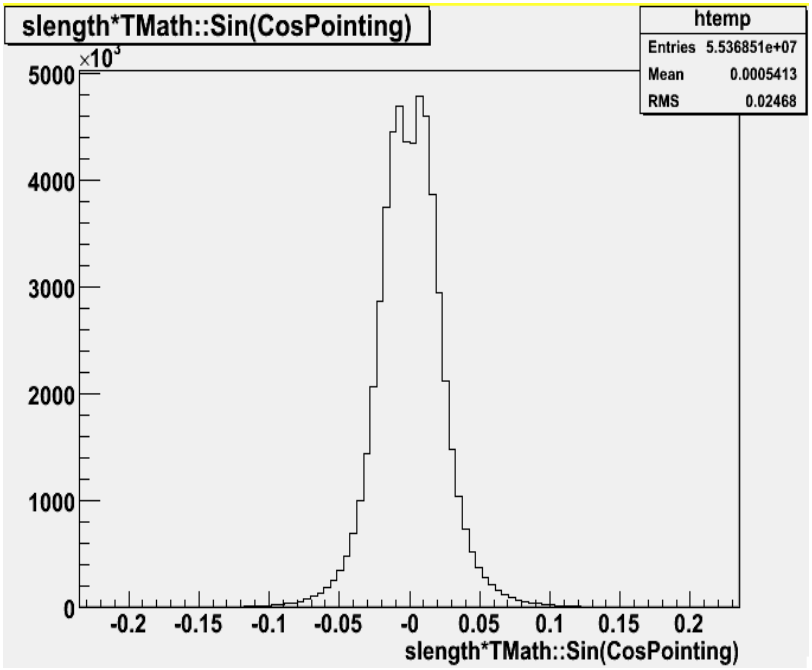


Cosine of Pointing

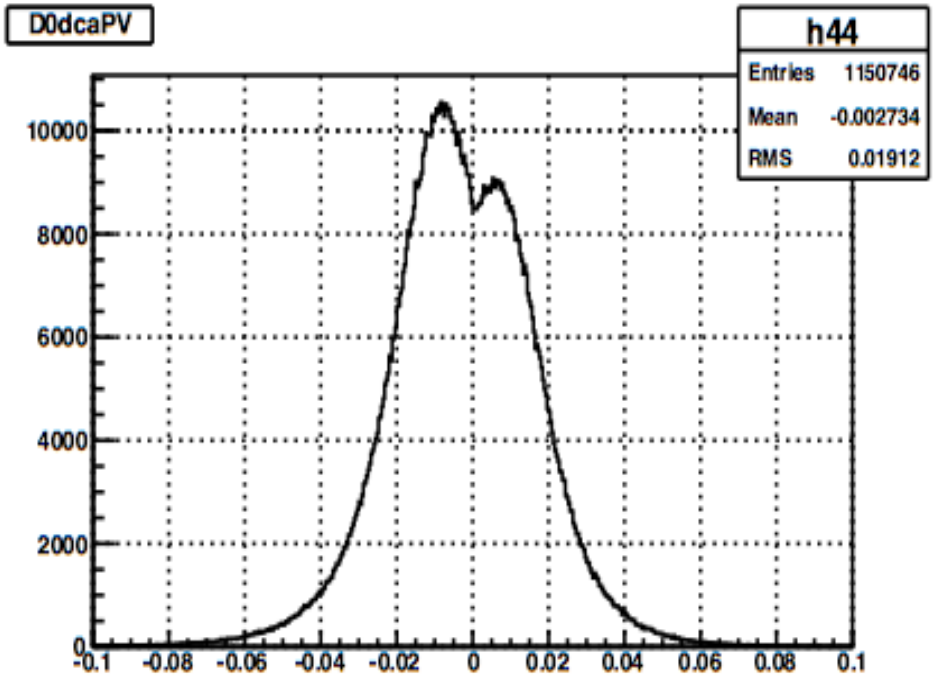


D0dcaPV = slength*Cos(PointingAngle)

Before pico cuts



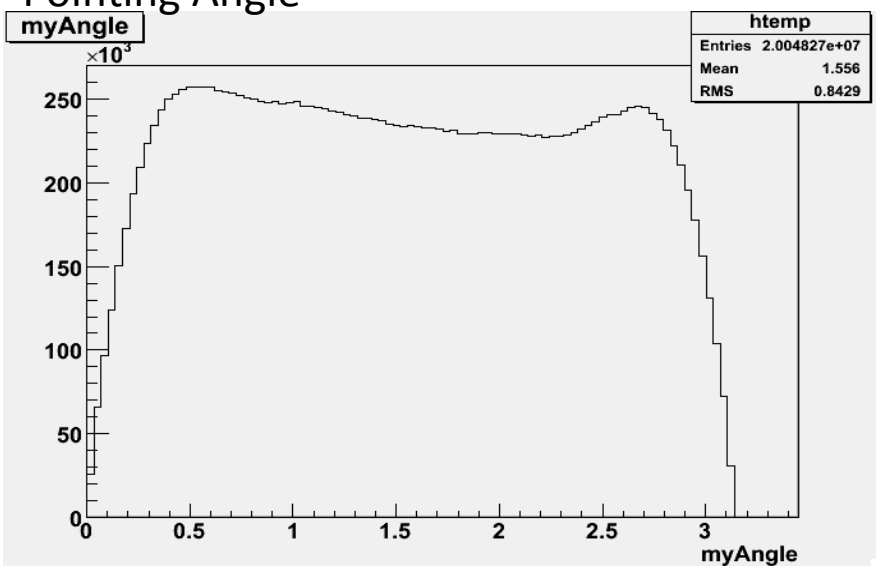
After cuts



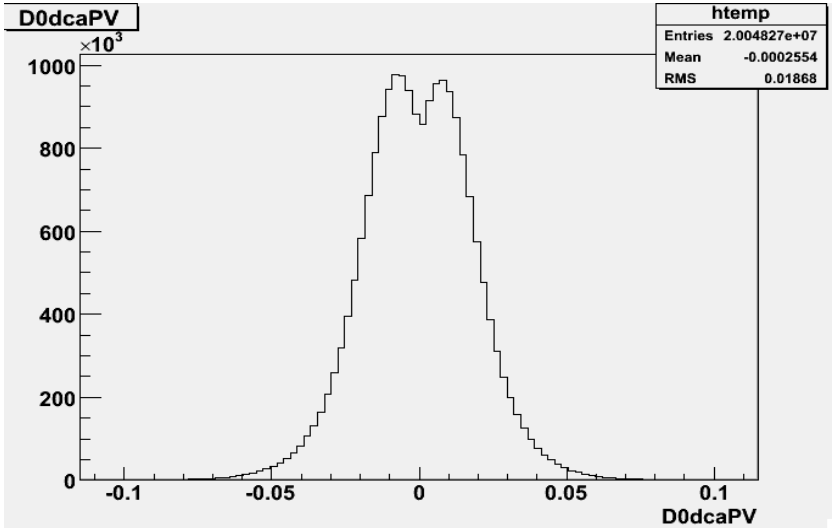
We see differences in the distribution of Pointing angle, Cos (Pointing angle) and D0dcaPV after the pico file cuts.
Why does D0dcaPV distribution looks asymmetric?
Are we biasing the distributions with any pico cuts?

D0dcaPV from 1st Production

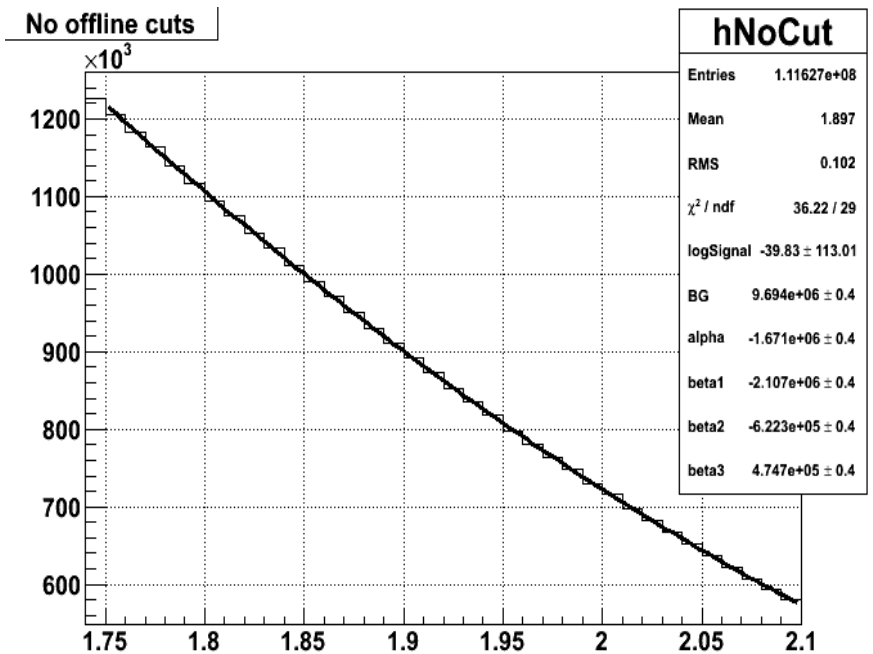
Pointing Angle

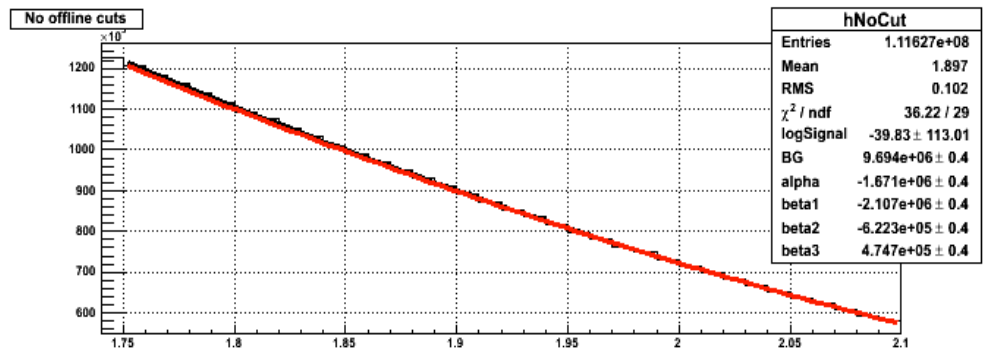


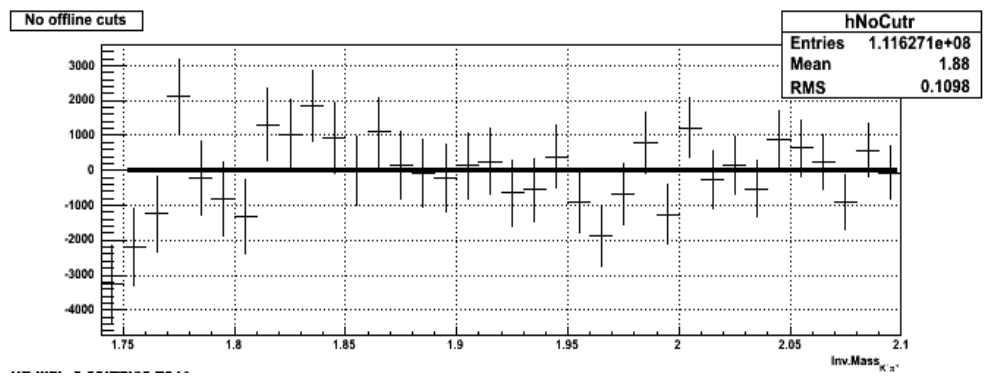
D0dcaPV



Invariant Mass Plot – No Cut



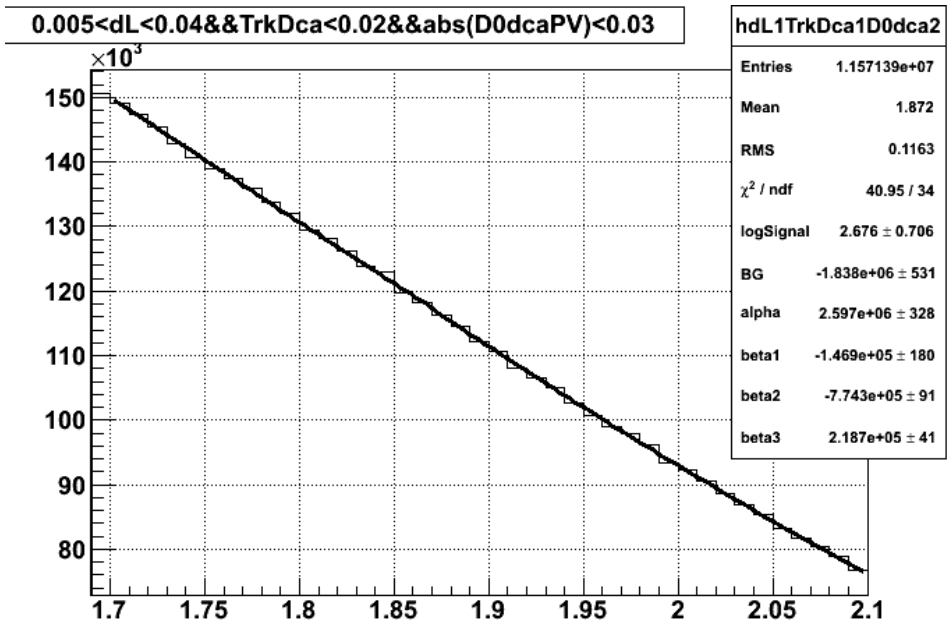


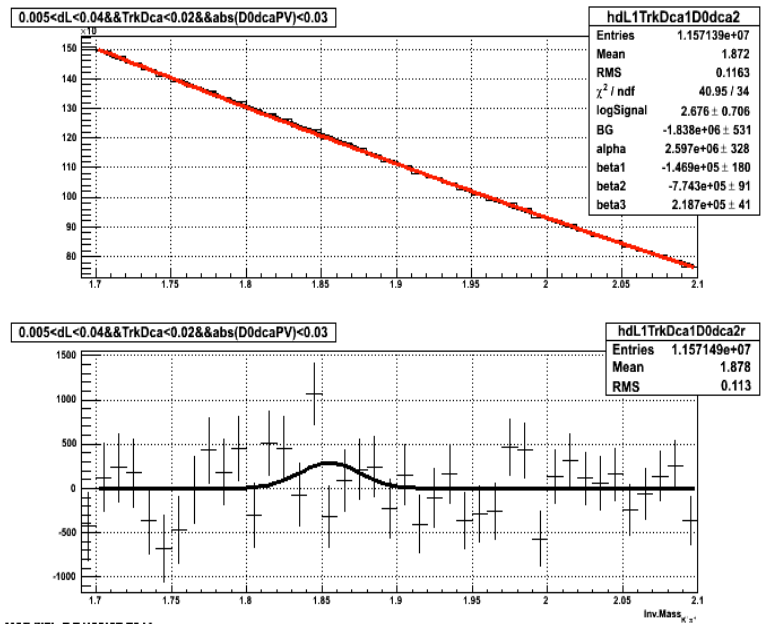


No Signal

Inv Mass Plot

50µm<dL<400µm, DcaKpi<200µm,|D0dcaPV|<300µm (positive decayLength only)

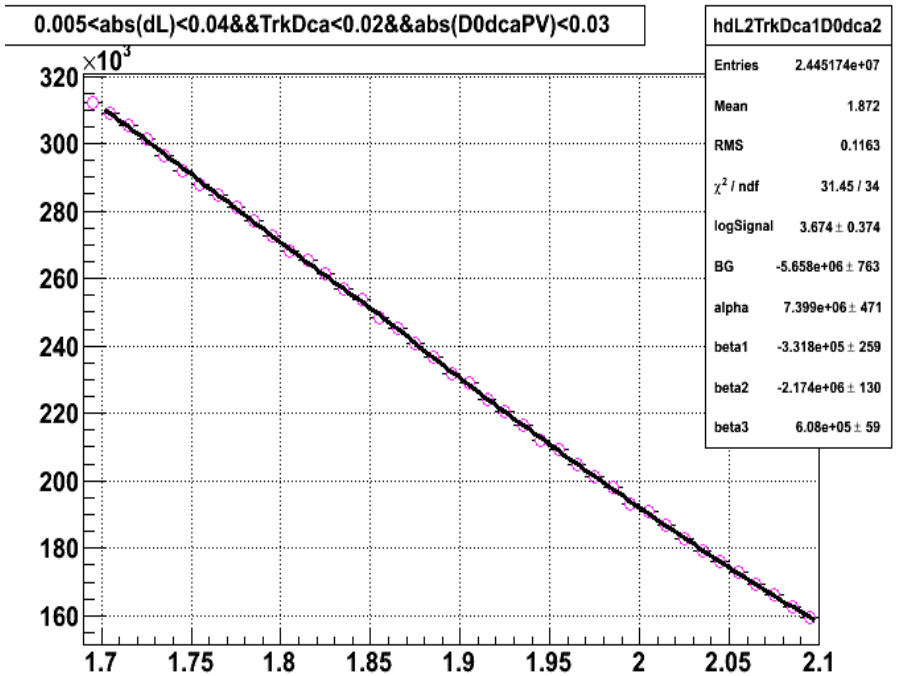


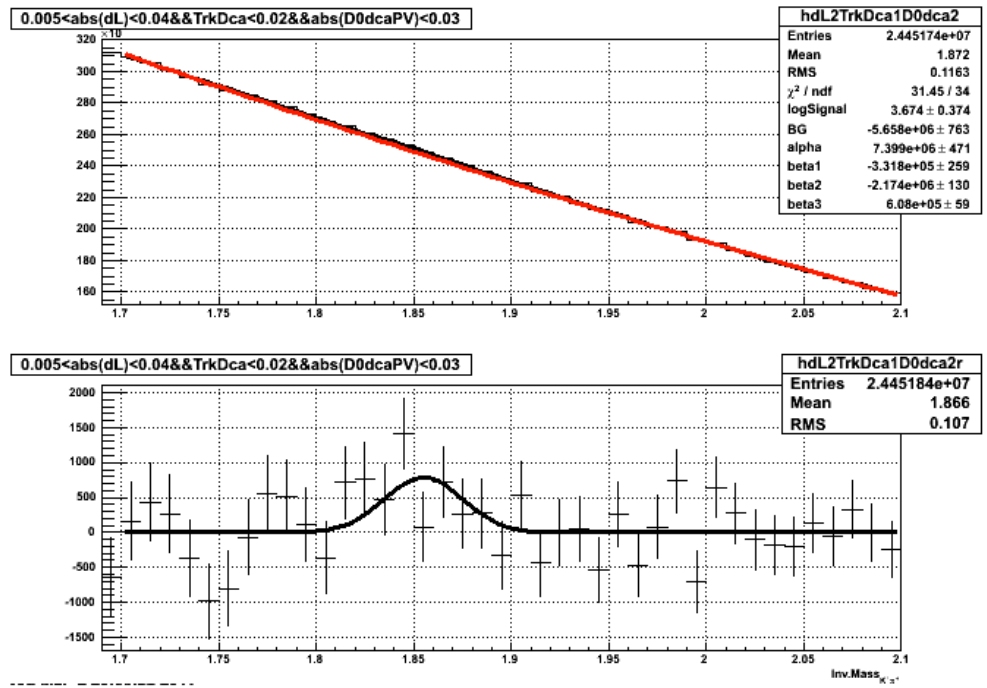


S/B ~ 1.42

Inv Mass Plot

50µm<|dL|<400µm, DcaKpi<200µm,|D0dcaPV|<300µm (+ve and -ve decayLength)

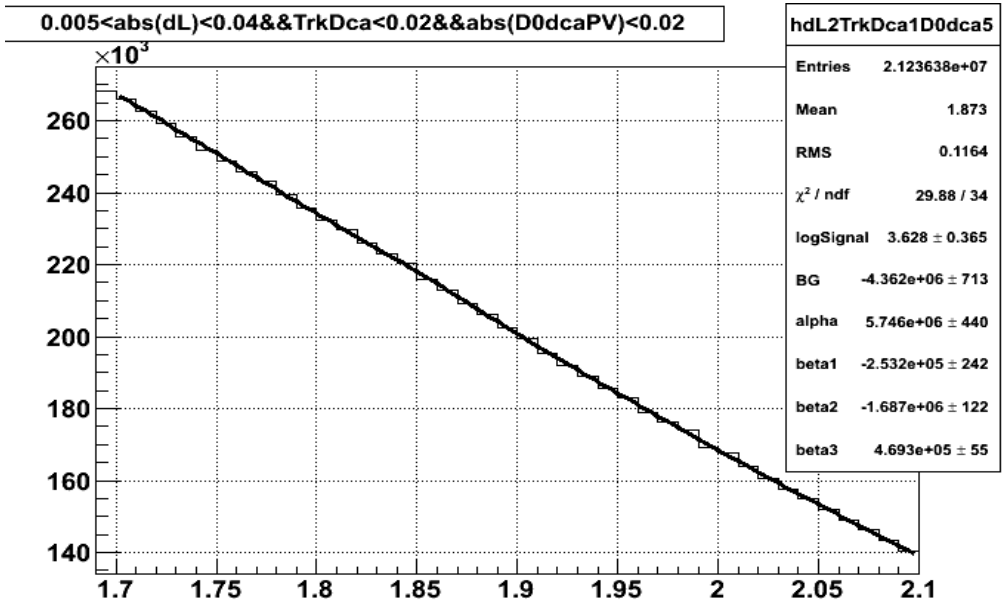


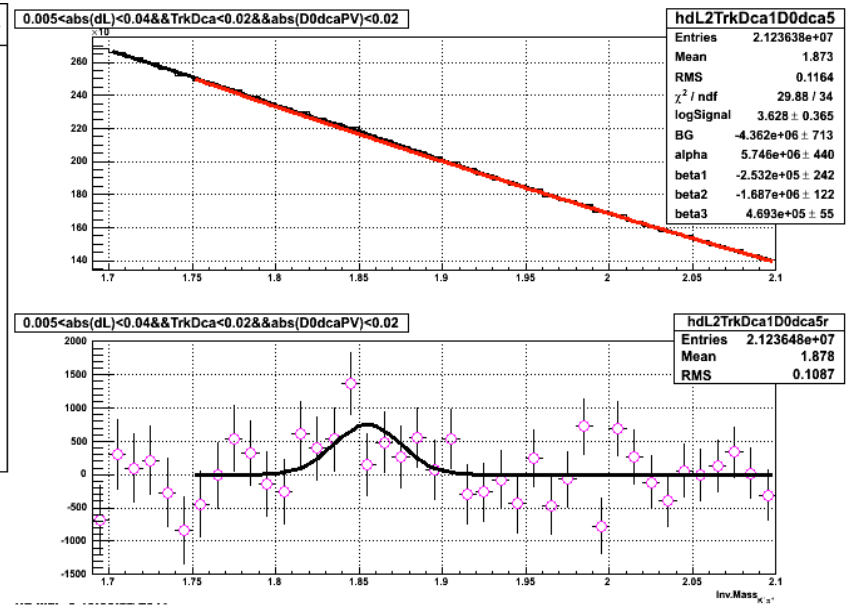


S/B ~ 2.67

Inv Mass Plot

50μm<|dL|<400μm, DcaKpi<200μm, |D0dcaPV|<200μm

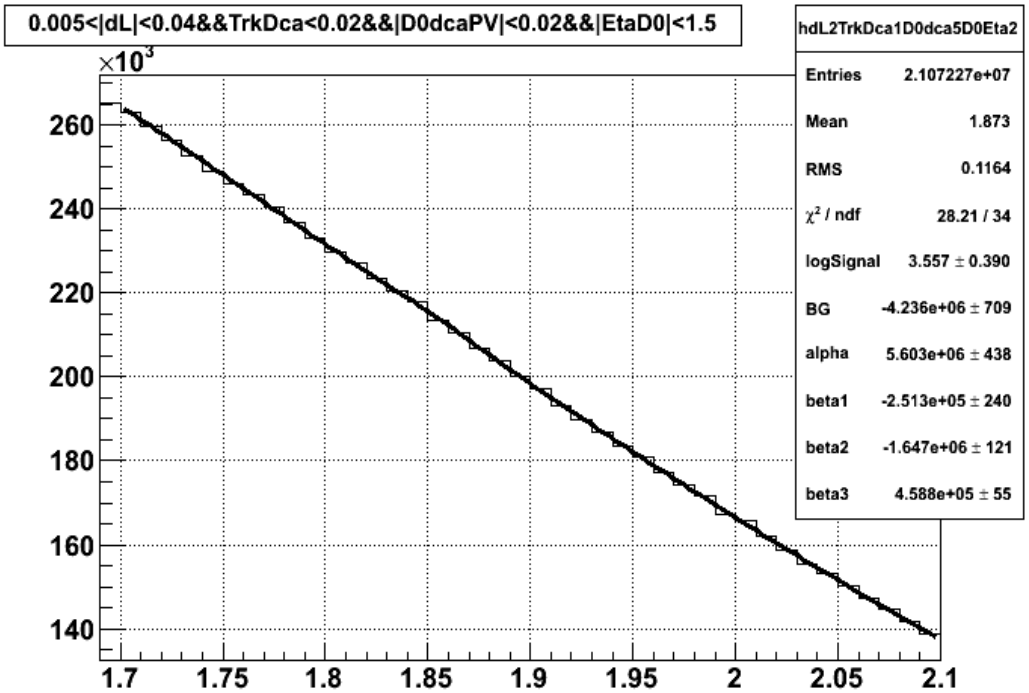


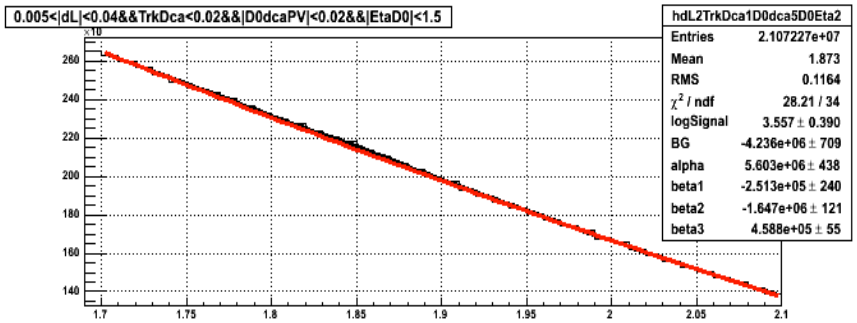


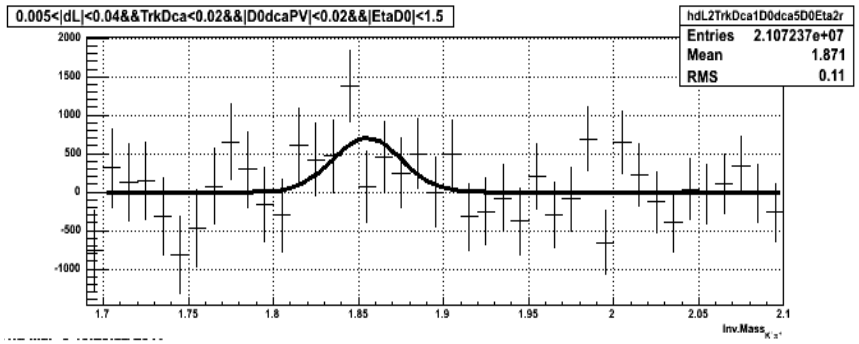
S/B ~ 2.74

Inv Mass Plot

50µm<|dL|<400µm, DcaKpi<200µm,|D0dcaPV|<200µm, |EtaD0|<1.5



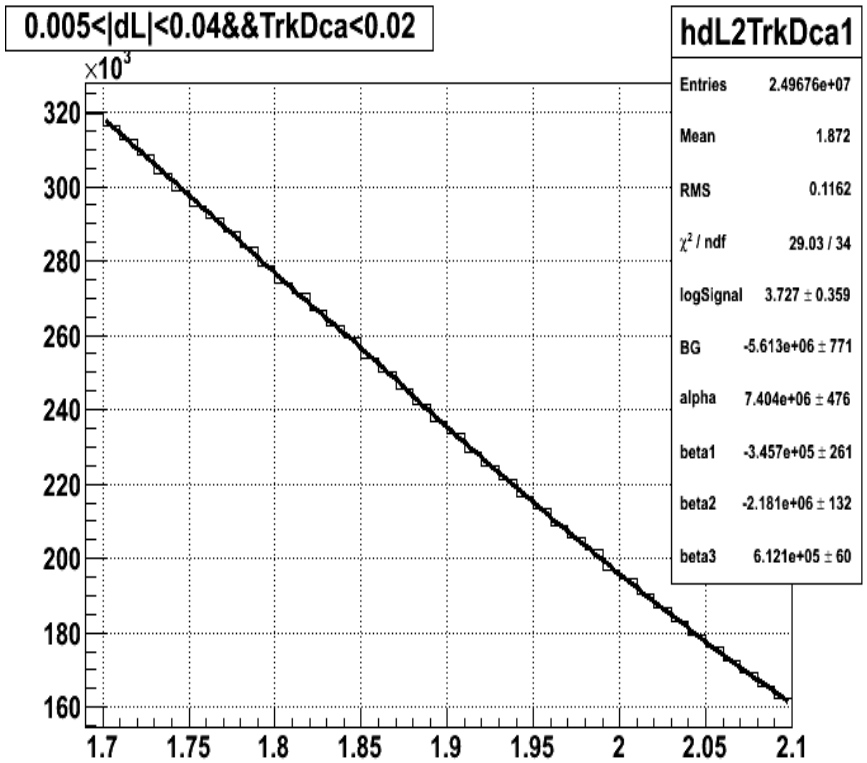


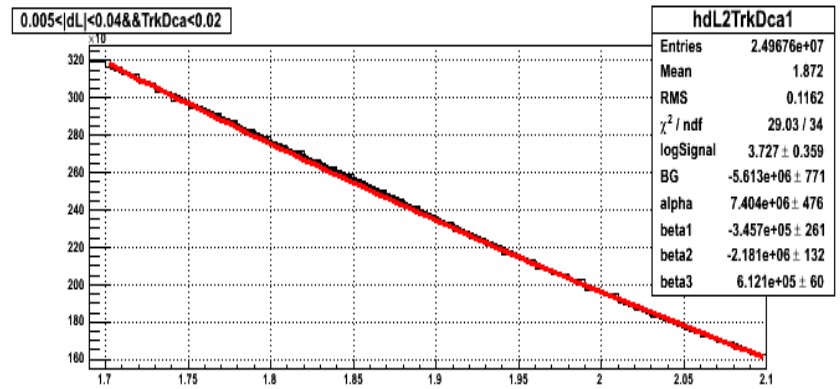


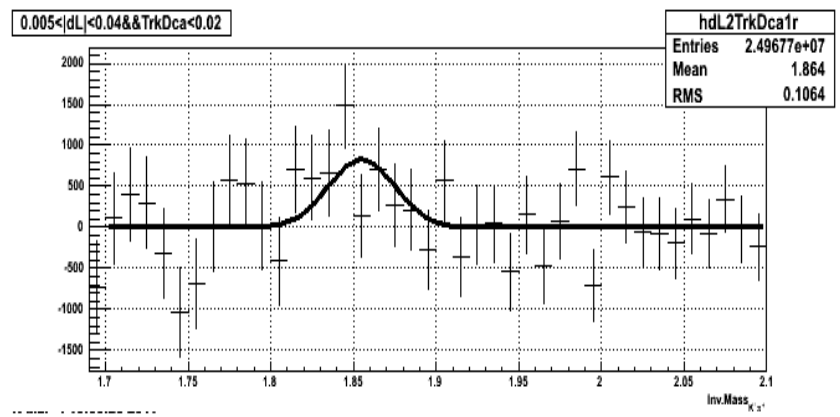
S/B ~ 2.56

Inv Mass Plot

50µm<|dL|<400µm, DcaKpi<200µm



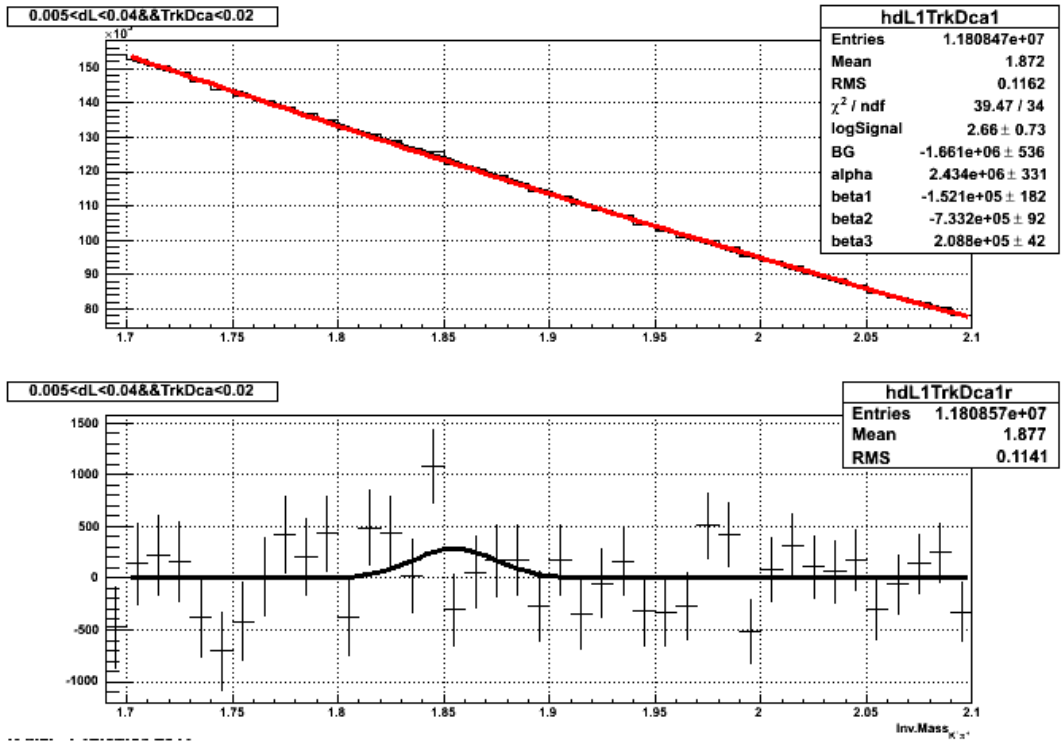




S/B ~ 2.79

Inv Mass Plot

50μm<dL<400μm, DcaKpi<200μm



S/N ~ 1.38