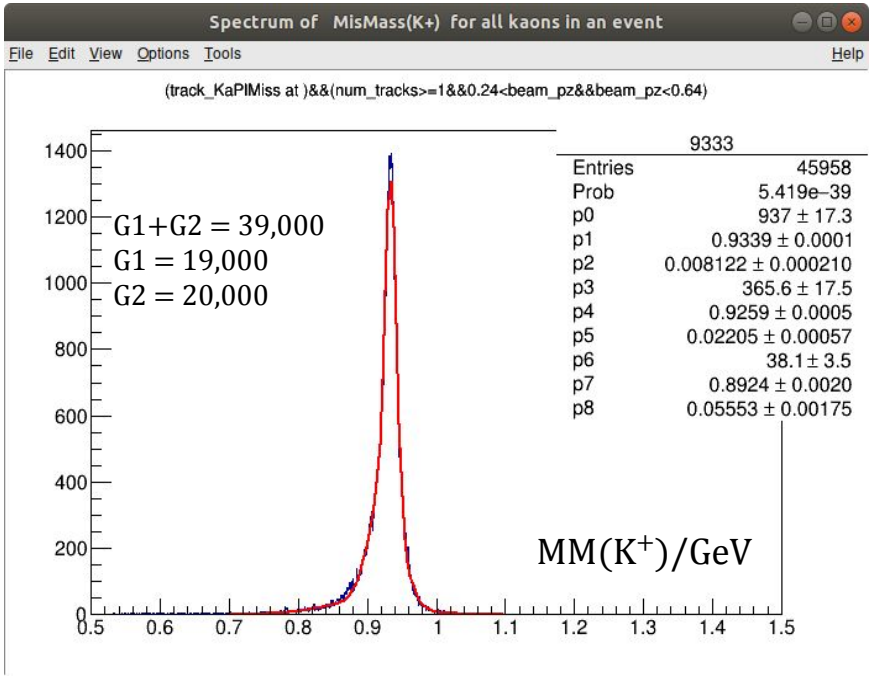
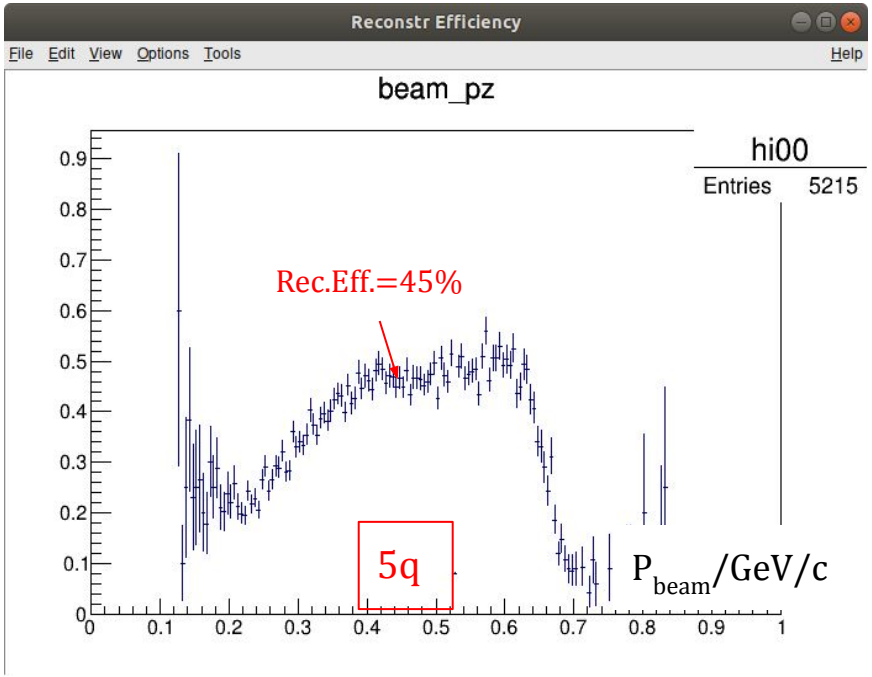
No Reaction Filter. Reconstruction of $K_L + p \rightarrow K^+ + n$ at $p_{K\text{-}Long} = (0.23 ; 0.65)$ GeV/c.

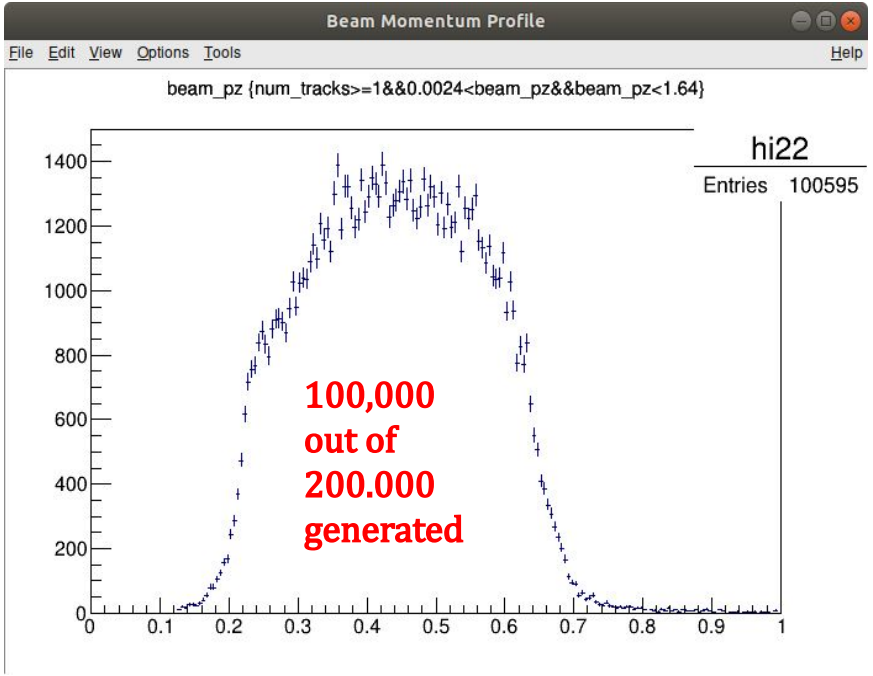
KLGenerator_hddm_V3 -M**200000** -Fgenerated.root -Ekaon:plain:**0.05:0.32** -Rkl1





- The yield of neutrons is ~40,000 out of 200,000 generated $K_L + p$ reactions (~20%).
- Reconstruction Efficiency in the 5q-region is of 45%.

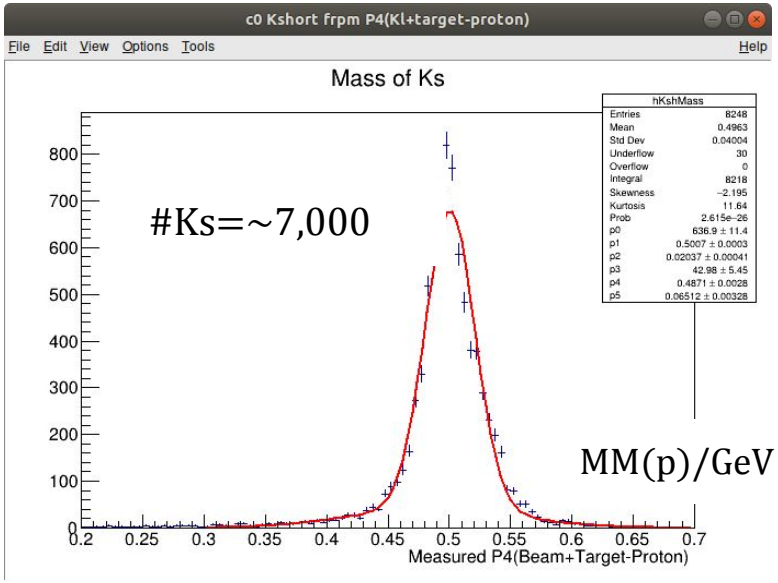
Why only 100,000 out of 200,000 generated $K_L + p \rightarrow K^+ + n$ in ROOT tree?

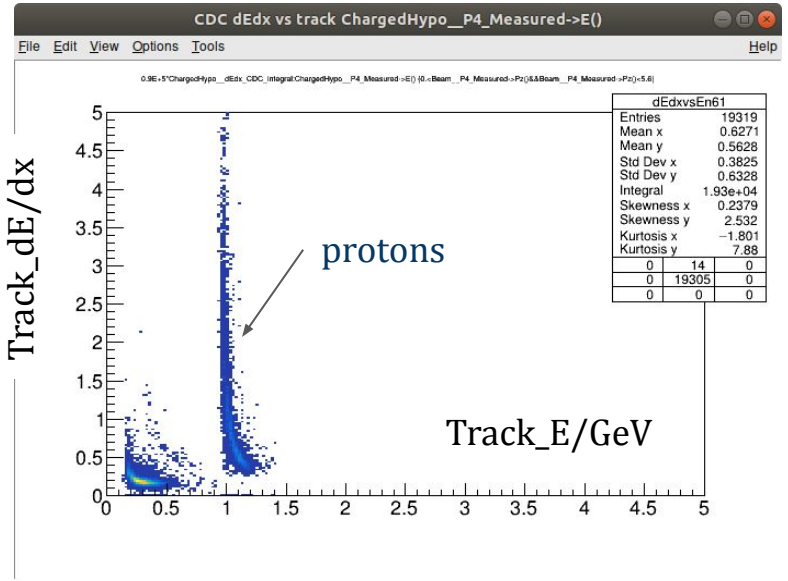



```
*.....................................................................*
*Br   53 :thrown_pz : thrown_pz[num_thrown]/D                         *
*Entries :   112557 : Total  Size=    7309119 bytes  File Size  =    2437751 *
*Baskets :       31 : Basket Size=     479744 bytes  Compression=   3.00     *
*.....................................................................*
*Br   54 :num_tracks : num_tracks/i                                   *
*Entries :   112557 : Total  Size=     452287 bytes  File Size  =      49084 *
*Baskets :       17 : Basket Size=      26624 bytes  Compression=   9.20     *
*.....................................................................*
```

Reaction Filter. Reconstruction of $K_L + p \rightarrow K_s + p$ at $p_{K\text{-}Long} = (0.23 ; 0.65)$ GeV/c.

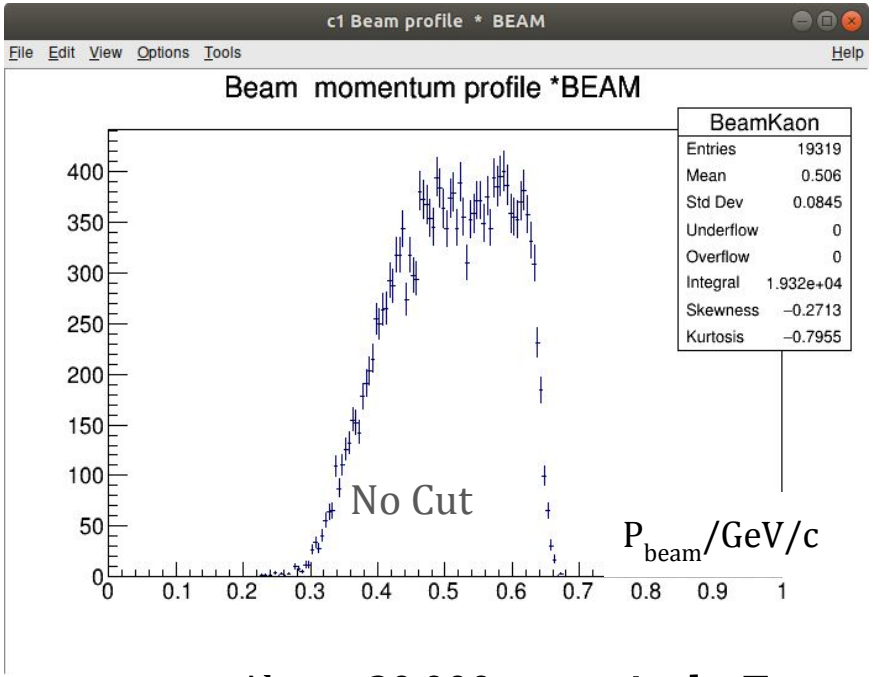
KLGenerator_hddm_V3 -M**200000** -Fgenerated.root -Ekaon:plain:**0.05:0.32** -Rkl1

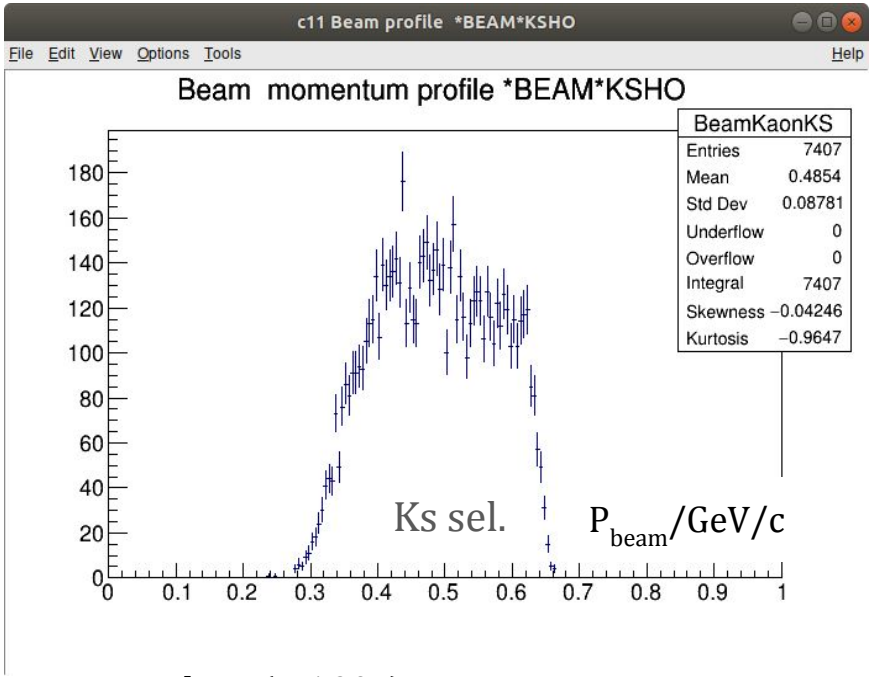





```
hd_root --nthreads=8 -PTRIG:BYPASS=1 -PEVENTRFBUNCH:USE_TAG=KLong
-PVERTEX:USEWEIGHTEDAVERAGE=1 -PVERTEX:USE_KLONG_VERTEX=1
-PPLUGINS=monitoring_hists,ReactionFilter -PReaction1=10_14__16_14
-PReaction1:Flags=B0_M16_F2 hdgeant4_output_smeared.hddm
```

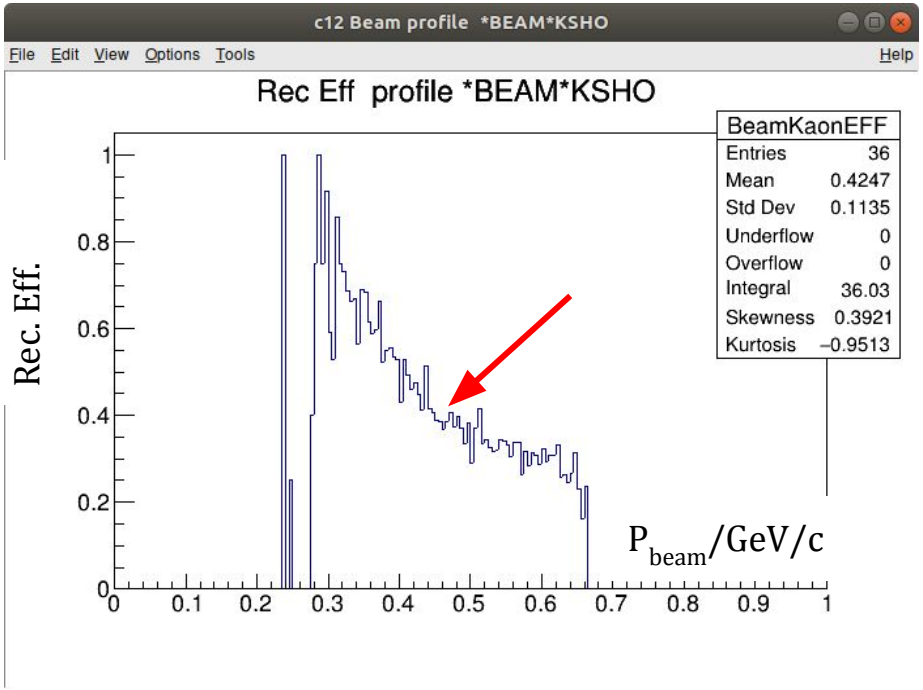
Reaction Filter. Beam profiles and Reconstruction Efficiency.





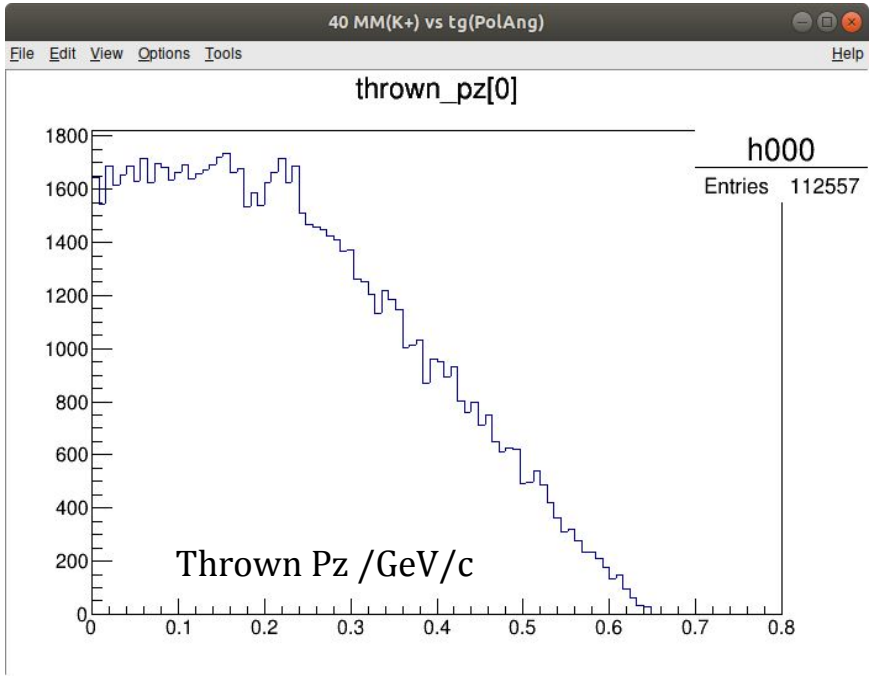
- About **20,000 events in the Tree** after Reaction Filter (~10%).
- The **yield of K-shorts is of 7,000** out of 200,000 generated events (~3.5%).
- **Reconstruction Efficiency** Histogram = Divide(Right_Hist : Left_Hist). **Next slide.**

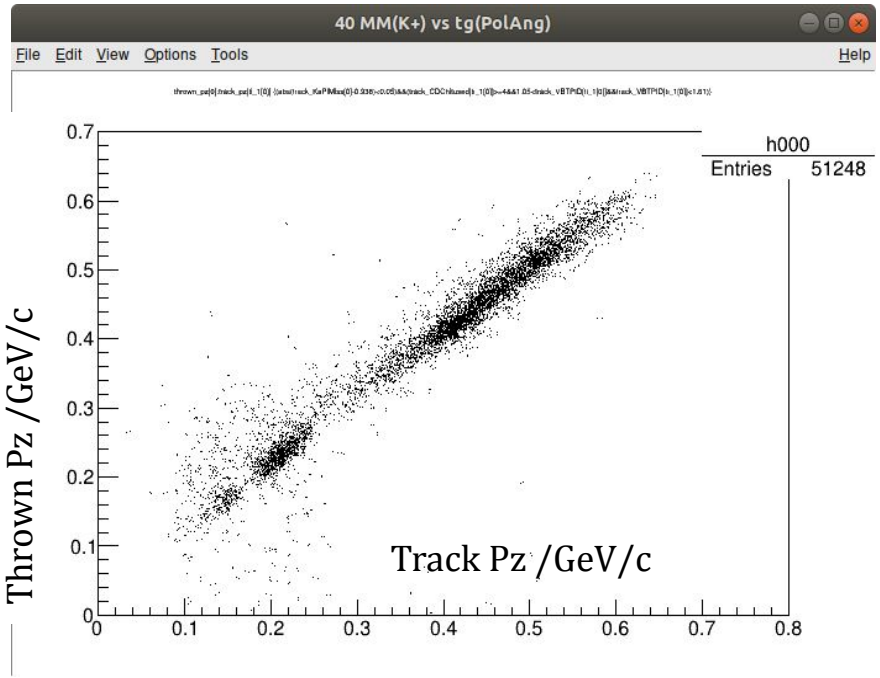
Reaction Filter. Reconstruction Efficiency.



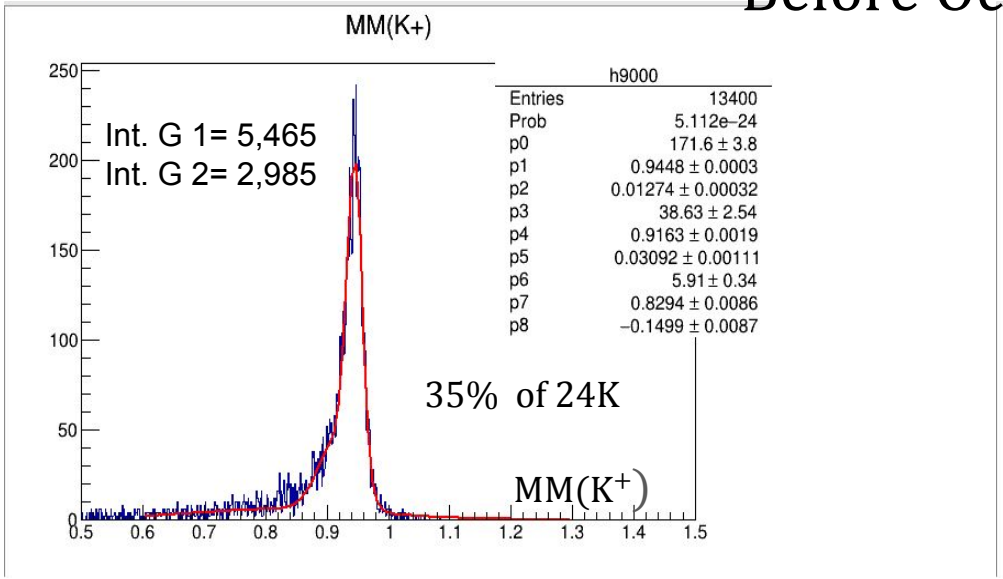
- In the 5q-region (0.44 GeV/c) Reconstruction Efficiency is of 40%.
- The yield of K-shorts is of 3.5% ot of 200,000 generated.

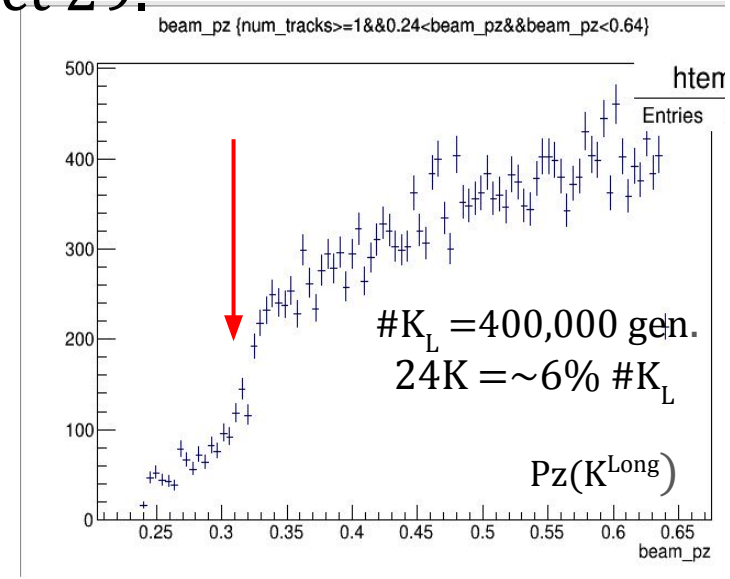
Why a structure in track_pz shows up?





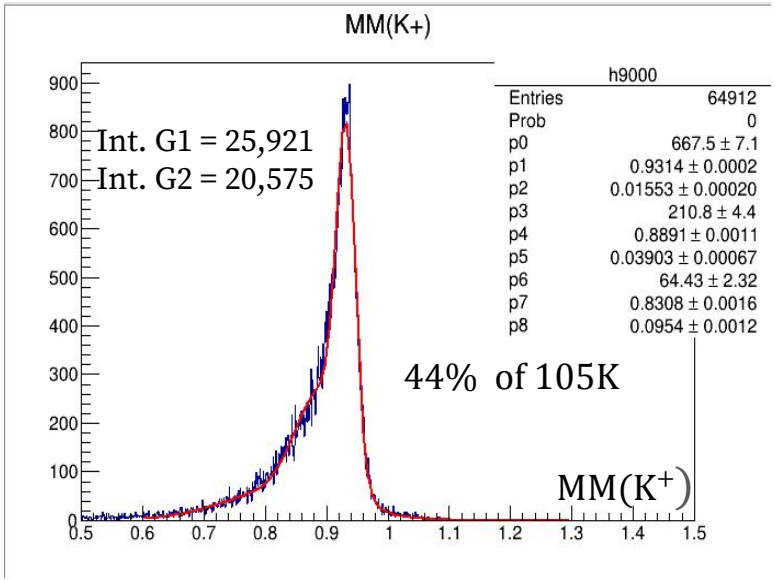
Generated $K^+ + n$ final state at p_{KLong} =(0.24:10.64) GeV/c
Before Oct 29.

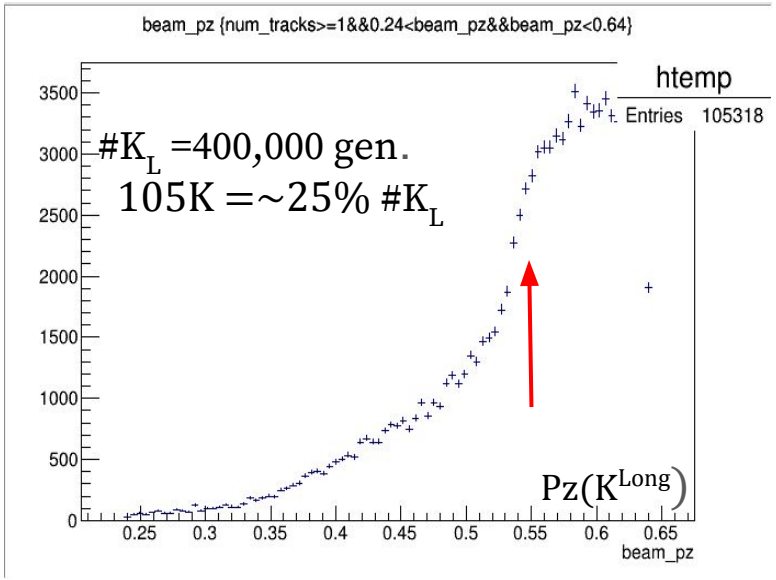




- Reconstruction efficiency drops at p_{Klong}<0.32 GeV/c.

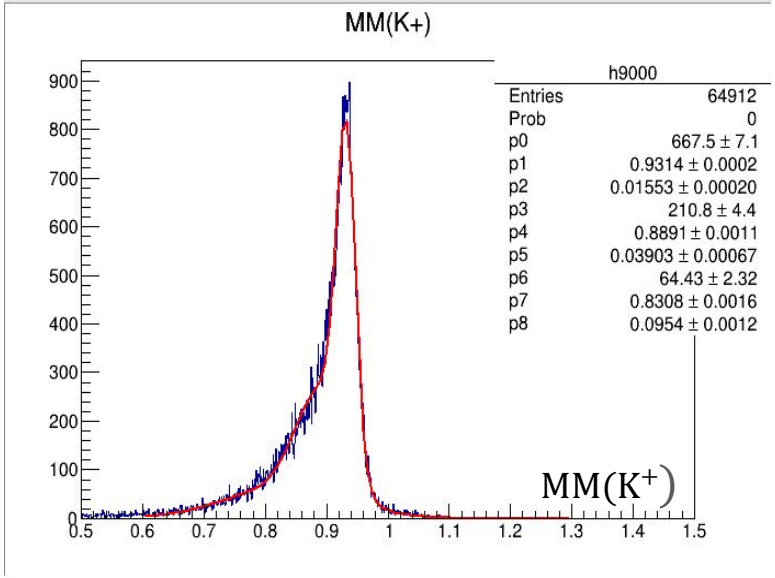
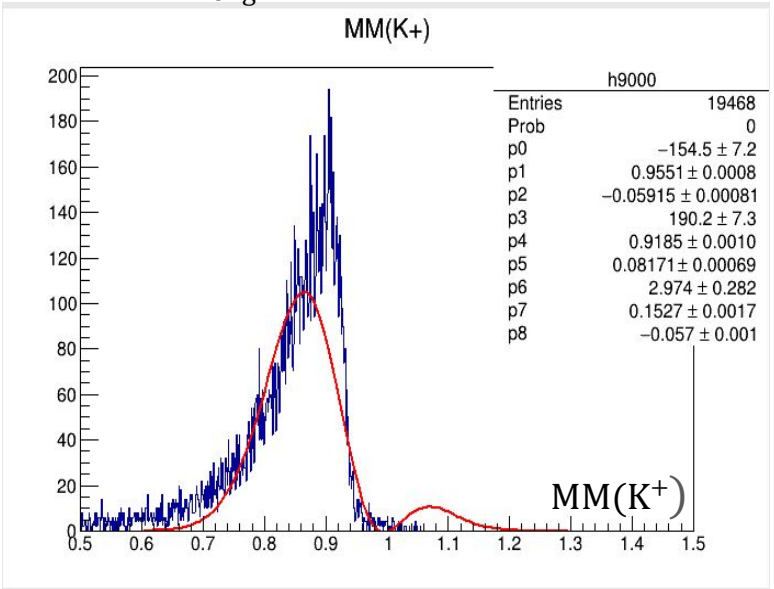
Generated $K^+ + n$ final state at p_{KLong} =(0.24:0.64) GeV/c
After Oct 29.





- Reconstruction efficiency drops at p_{Klong}<0.55 GeV/c.
- Looks like we have a higher beam momentum threshold !
- B field changed to higher in GEANT model ? Inner CDC layers are not included ?

p_{KLong} =(0.24:0.64) GeV/c



p_{KLong} =(0.24:0.54) GeV/c