Kaon LT Status Update

June 9th, 2020

Richard Trotta

KaonLT Package

- ✓ Fixed a number of issues/bugs such as...
  - Not properly subtracting cuts
  - Not properly adding coin time cuts
  - Incorporated tracking cuts fully
  - Fixed some pathing and naming issues that arose (so tedious)
  - Trimmed some fat
- ✓ Fixed the luminosity script to be compatible with KaonLT package
  - Results look good compared to Ali's results (see next slides)
  - Tried to run batch job for some plots but had issues (see below)
- ✓ Tested on farm and works as expected
  - Although ROOT 18+ will need to be sourced
- ➢ Currently testing batch scripts with some possible issues
  - Nothing in the shell scripts changed so not sure what the issue is
  - Some of my runs were on the batch for 10+ hours, I ended up killing them
  - I can't find where they moved error logs so no way to see what the problem is

Run # 8038 E = 8.2 GeV I = 71 uA
P = +6.05 GeV Angle = 6.91 Rate ¾ = 706 kHz

- Number of SHMS good events: 463239 +/- 681
- Calculated fid tracking efficiency: 0.958941 +/- 0.003630
- Calculated hadron tracking efficiency: 1.000000 +/- 0.028868
- Calculated pion tracking efficiency: 1.000000 +/- 0.028868
- Calculated kaon tracking efficiency: 1.000000 +/- 0.058824
- Calculated proton tracking efficiency: 1.000000 +/- 0.127000

Ali

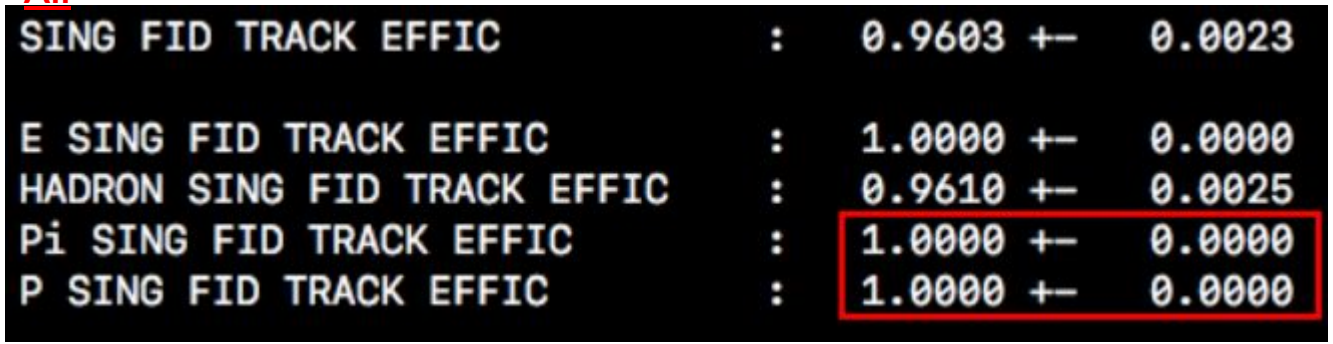
```
SING FID TRACK EFFIC          :   0.9116 +-   0.0037

E SING FID TRACK EFFIC        :   1.0000 +-   0.0000
HADRON SING FID TRACK EFFIC   :   0.9127 +-   0.0039
Pi SING FID TRACK EFFIC       :   1.0000 +-   0.0000
P SING FID TRACK EFFIC        :   1.0000 +-   0.0000
```

Run # 8054 E = 8.2 GeV I = 4 uA
P = +6.05 GeV Angle = 6.91 Rate ¾ = 76 kHz

- Number of SHMS good events: 897243 +/- 947
- Calculated fid tracking efficiency: 0.974326 +/- 0.009935
- Calculated hadron tracking efficiency: 1.000000 +/- 0.080064
- Calculated pion tracking efficiency: 1.000000 +/- 0.080064
- Calculated kaon tracking efficiency: 1.000000 +/- 0.194257
- Calculated proton tracking efficiency: 1.000000 +/- 0.324443

Ali



```
SING FID TRACK EFFIC          :   0.9603 +-   0.0023

E SING FID TRACK EFFIC        :   1.0000 +-   0.0000
HADRON SING FID TRACK EFFIC   :   0.9610 +-   0.0025
Pi SING FID TRACK EFFIC       :   1.0000 +-   0.0000
P SING FID TRACK EFFIC        :   1.0000 +-   0.0000
```

Lumi Script

- I need to go through all lumi runs to check script
  - Need to find where batch error log was changed to
- Need to fix EDMT results
  - Currently nonsensical or zero
  - Unreliable electronic deadtime currently in use, need EDTM for true value
- I want to compare hcana before and after Mark's changes
  - Once batch script is working this should be easy enough
- Need to incorporate Mark's reference time changes (see Stephen's talk)