

KaonLT Analysis Update

(HMS Cal & Cer PID and Efficiency)

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Preview

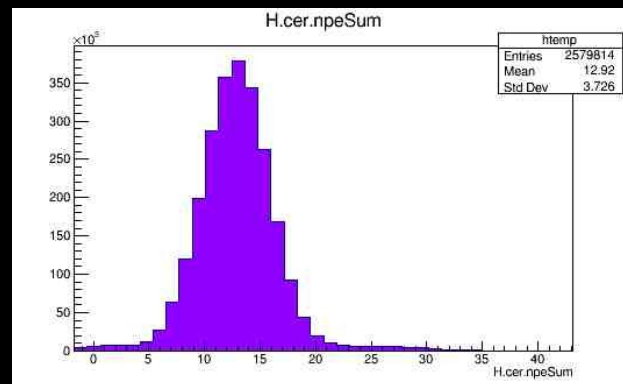
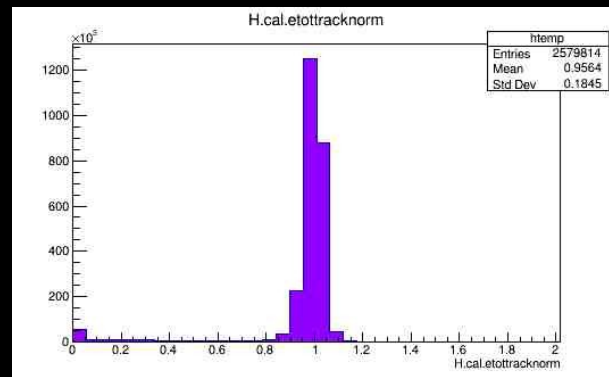
- Before starting LT separation, need to finalize PID and efficiencies (including cut dependent effects)
- Looking at the HMS calorimeter and Cherenkov.
- Using a clean sample of electrons
- Using Cherenkov to get clean sample for calorimeter and vice versa.

Kinematic Setting

- Picked a kinematic setting where pion rate in HMS is very low.
 - Beam Energy = 10.585
 - $Q_2 = 3.0$, $W = 2.32$
 - Run # 4865
 - HMS
 - $P = 6.59$, Angle = 11.91
 - S1X rate = 283.32 KHz
 - Predicted e-pi ratio = 100:1
- E rate = 63 KHz Pi- rate = 0.5 KHz

HMS Cherenkov

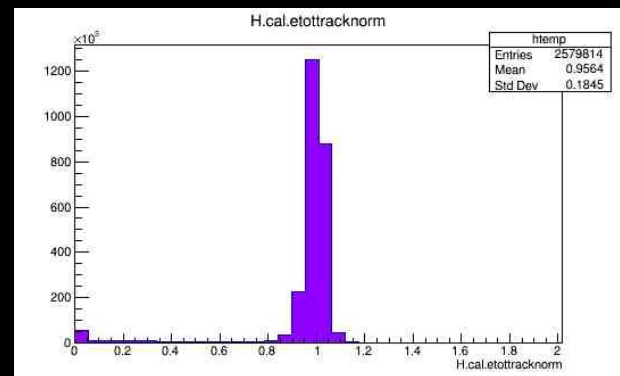
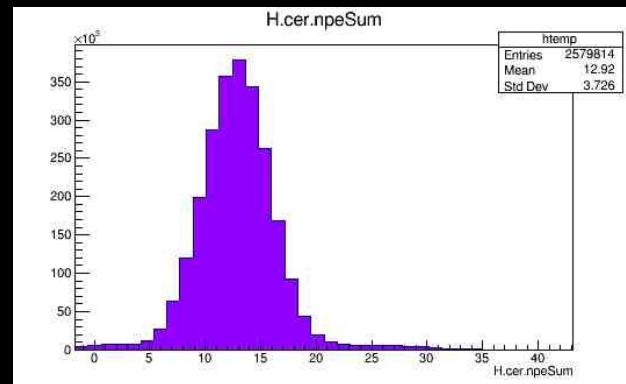
- General Cuts
 - $-0.08 < H.gtr.th < 0.08$
 - $-0.045 < H.gtr.ph < 0.045$
 - $-8 < H.gtr.dp < 8$
 - $H.hod.goodstarttime = 1$
 - $H.dc.InsideDipoleExit = 1$
- For Cherenkov efficiency
 - $H.cal.etottracknorm > 0.85$
 - $H.cer.npeSum > 3.0$



Eff = 95.10 +/- 0.01

HMS Calorimeter

- General Cuts
 - $-0.08 < H.gtr.th < 0.08$
 - $-0.045 < H.gtr.ph < 0.045$
 - $-8 < H.gtr.dp < 8$
 - $H.hod.goodstarttime = 1$
 - $H.dc.InsideDipoleExit = 1$
- For Calorimeter Efficiency
 - $H.cer.npeSum > 5.0$
 - $H.cal.etottracknorm > 0.7$



$$\text{Eff} = 95.86 \pm 0.01$$

Summary

- Used clean electron sample to calculate both Cherenkov and Calorimeter Efficiency in HMS.
- Efficiency values are lower than expected
- To-DO
 - Need to Check position dependence inside the calorimeter.
 - Need to check eff. At different rates and other kinematic settings.