

KaonLT Analysis Update

(HMS Cal & Cer Efficiency)

Ali Usman

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University of Regina



Preview

- Looking at the HMS calorimeter and Cherenkov. For a wide range of kinematics.
- Using a clean sample of electrons
- Using Cherenkov to get clean sample for calorimeter and vice versa.

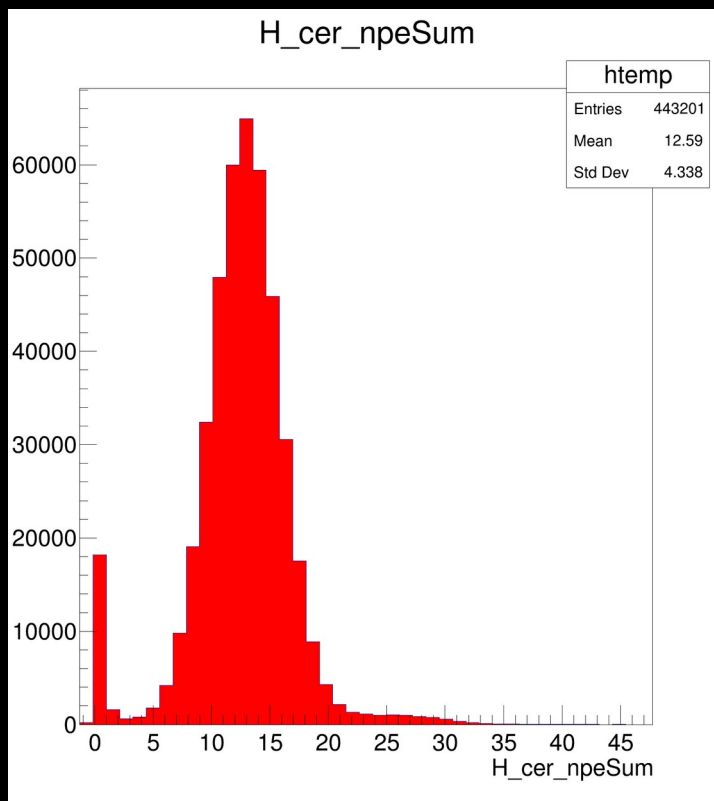
General Cuts

- 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
 - $H.cal.etotracknorm > 0.85 \ \&\& \ H.cer.npeSum > 2.0$
- For Calorimeter Efficiency
 - $H.cer.npeSum > 8.0 \ \&\& \ H.cal.etotracknorm > 0.7$

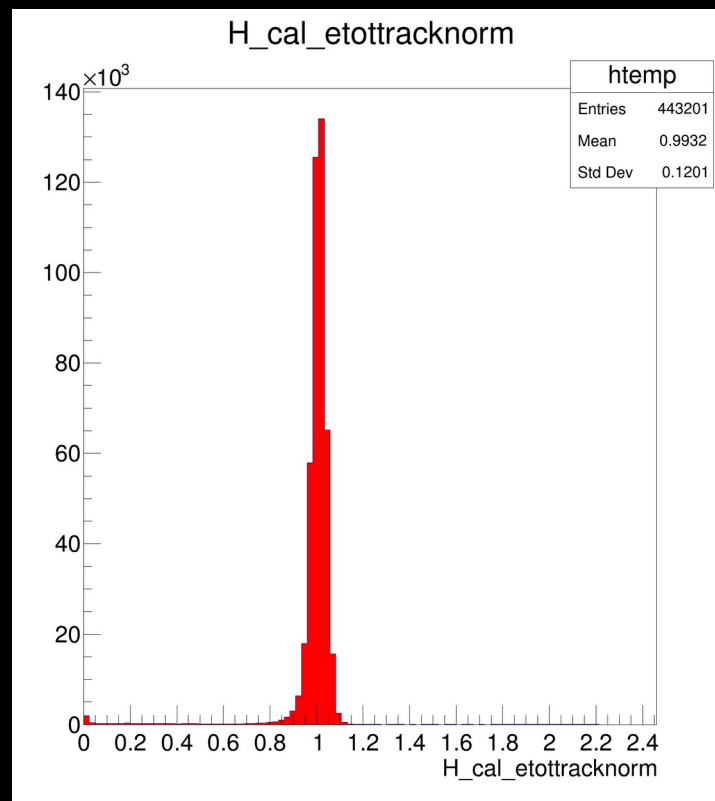
Kinematic Setting # 1

- Beam Energy = 10.585
- $Q_2 = 3.0$
- $W = 2.32$
- Run # 4871
- HMS
 - $P = 6.59$
 - Angle = 11.91
 - S1X rate = 313.189 kHz

Run # 4871



Cer Eff = 94.82 +/- 0.02

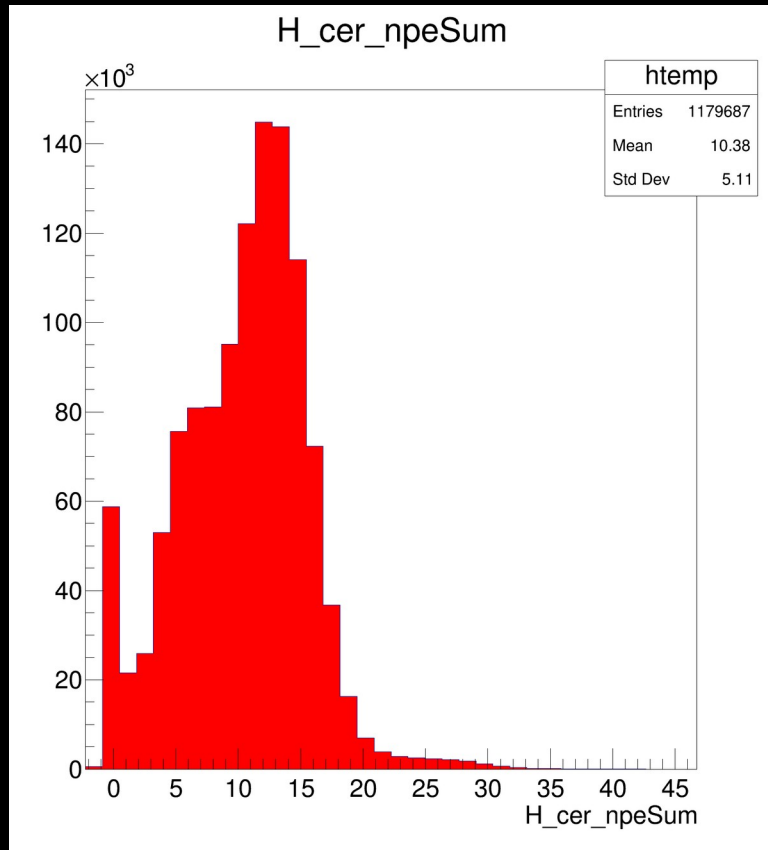


Cal Eff = 98.66 +/- 0.01

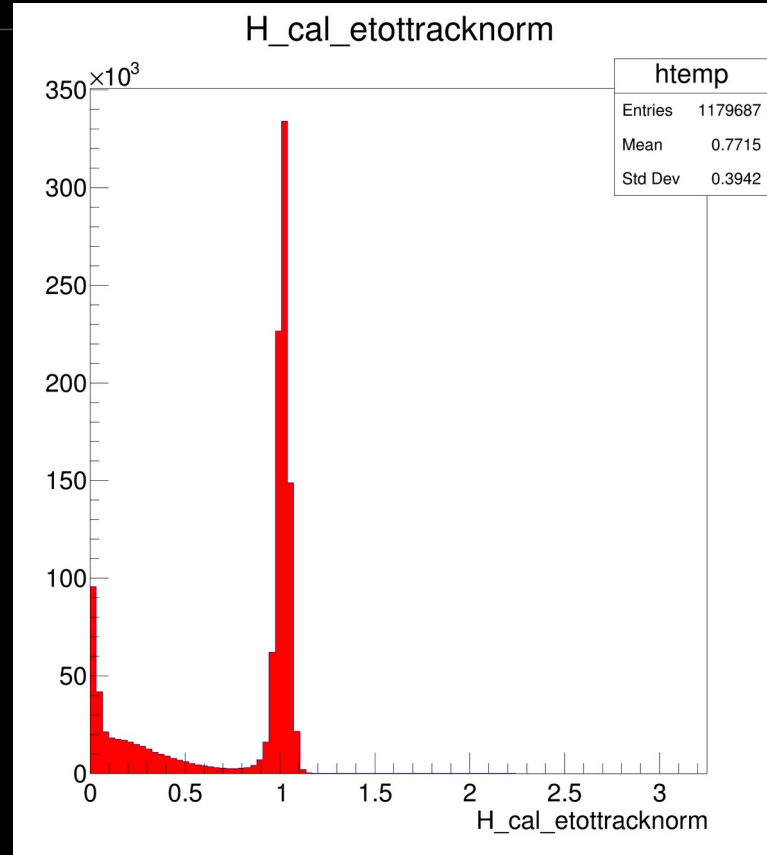
Kinematic Setting # 2

- Beam Energy = 10.585
- $Q_2 = 2.115$
- $W = 2.95$
- Run # 4919
- HMS
 - $P = 5.292$
 - Angle = 11.16
 - S1X rate = 394.802

Run # 4919



Cer Eff = 93.96 +/- 0.02

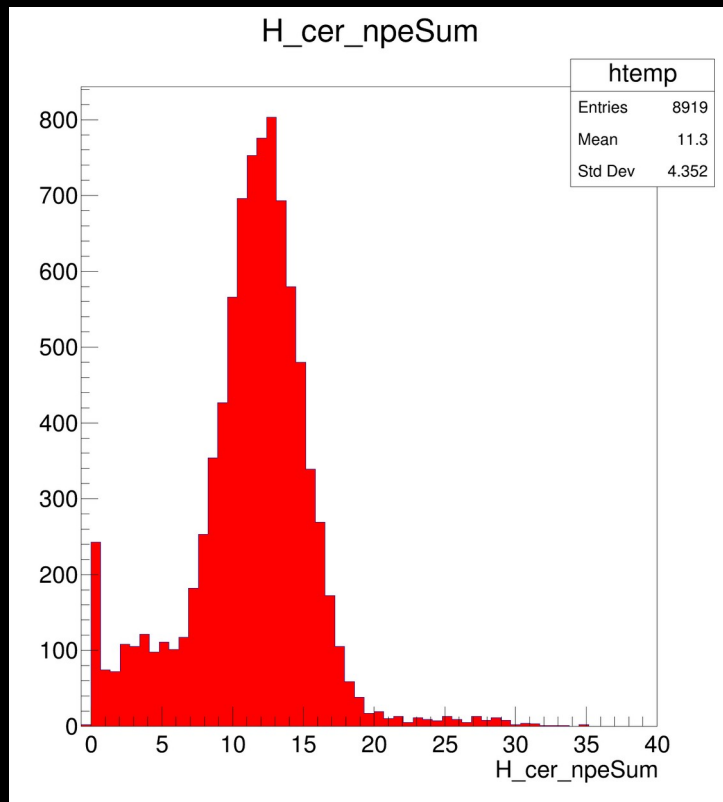


Cal Eff = 90.75 +/- 0.02

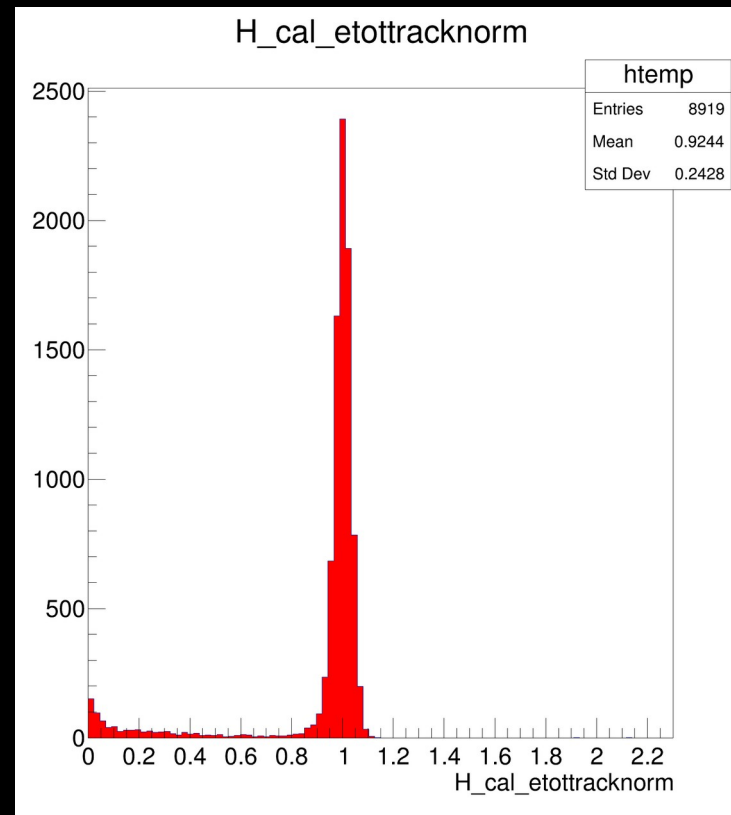
Kinematic Setting # 3

- Beam Energy = 10.585
- $Q_2 = 4.4$
- $W = 2.74$
- Run # 4987
- HMS
 - $P = 4.712$
 - Angle = 17.075
 - S1X rate = 39.559 kHz

Run # 4987



Cer Eff = 97.15 +/- 0.10

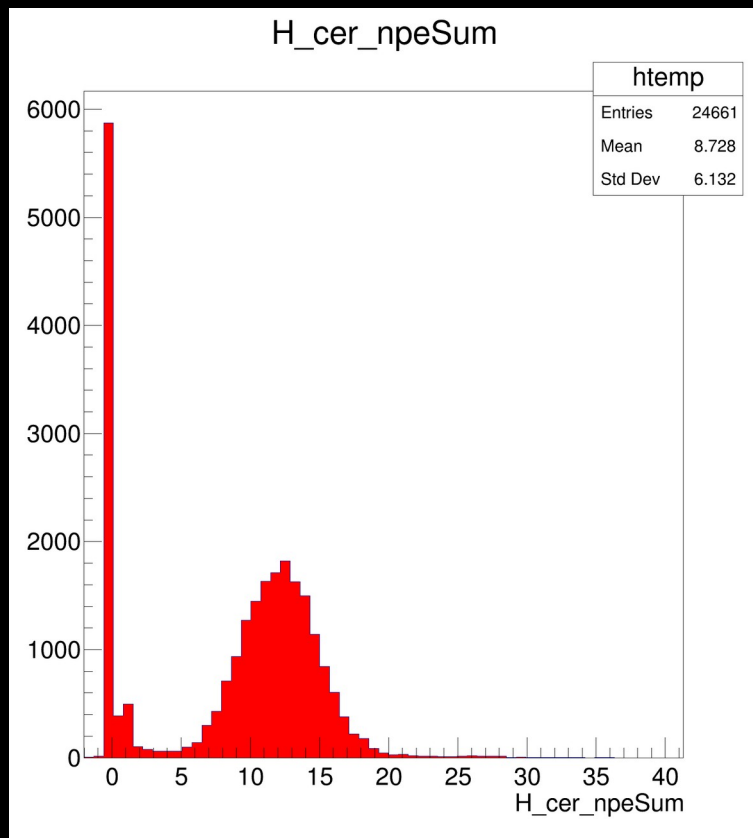


Cal Eff = 98.93 +/- 0.06

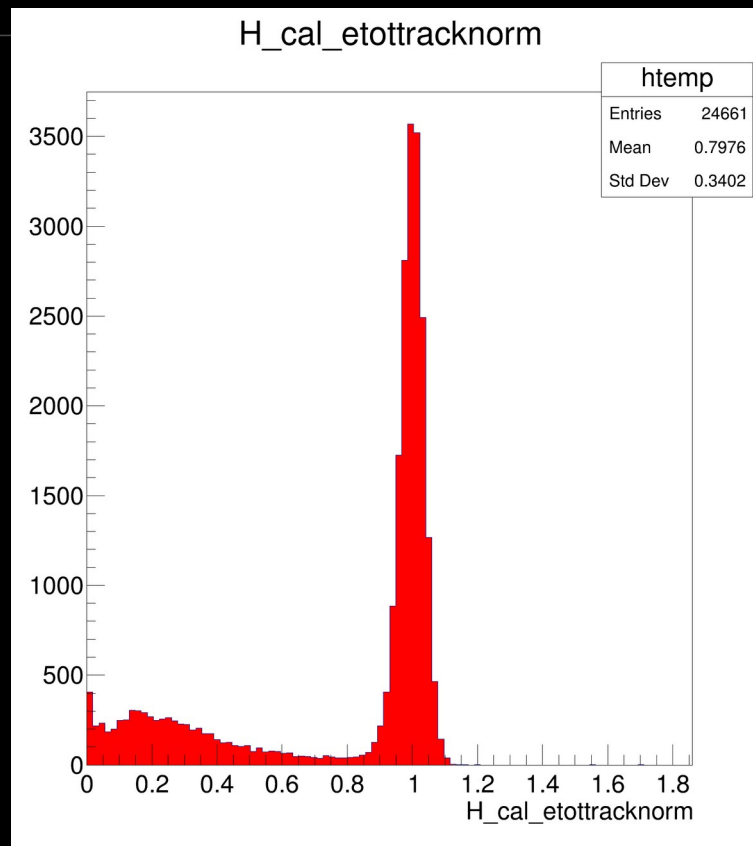
Kinematic Setting # 4

- Beam Energy = 10.585
- $Q_2 = 5.5$
- $W = 3.02$
- Run # 5222
- HMS
 - $P = 3.266$
 - Angle = 23.00
 - S1X rate = 86.798 kHz

Run # 5222



Cer Eff = 96.16 +/- 0.05

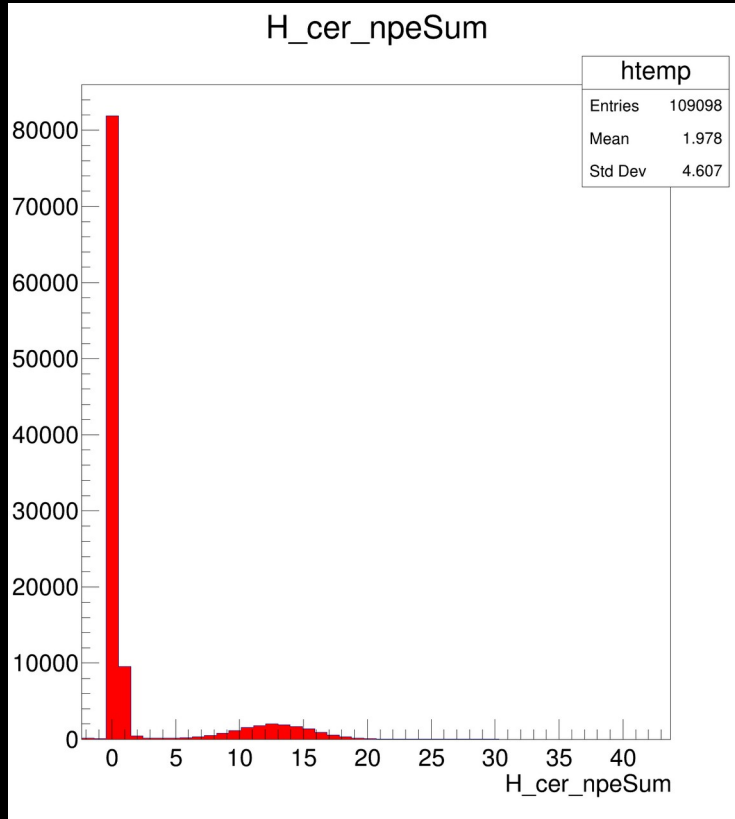


Cal Eff = 99.18 +/- 0.03

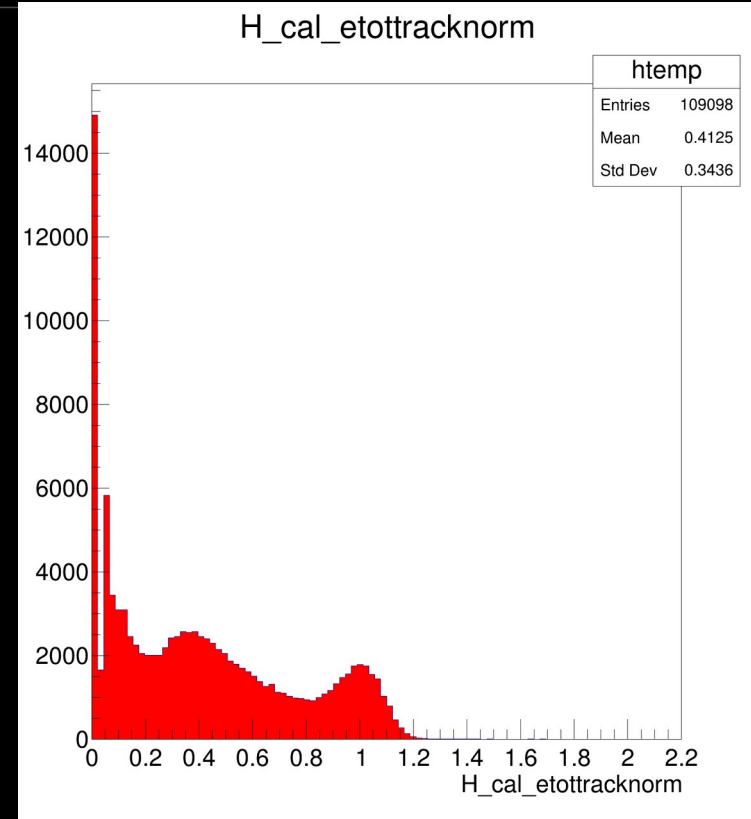
Kinematic Setting # 5

- Beam Energy = 6.1901
- $Q_2 = 2.115$
- $W = 2.95$
- Run # 7909
- HMS
 - $P = 0.888$
 - Angle = 35.15
 - S1X rate = 107.33 kHz

Run # 7909



Cer Eff = 75.71 +/- 0.14

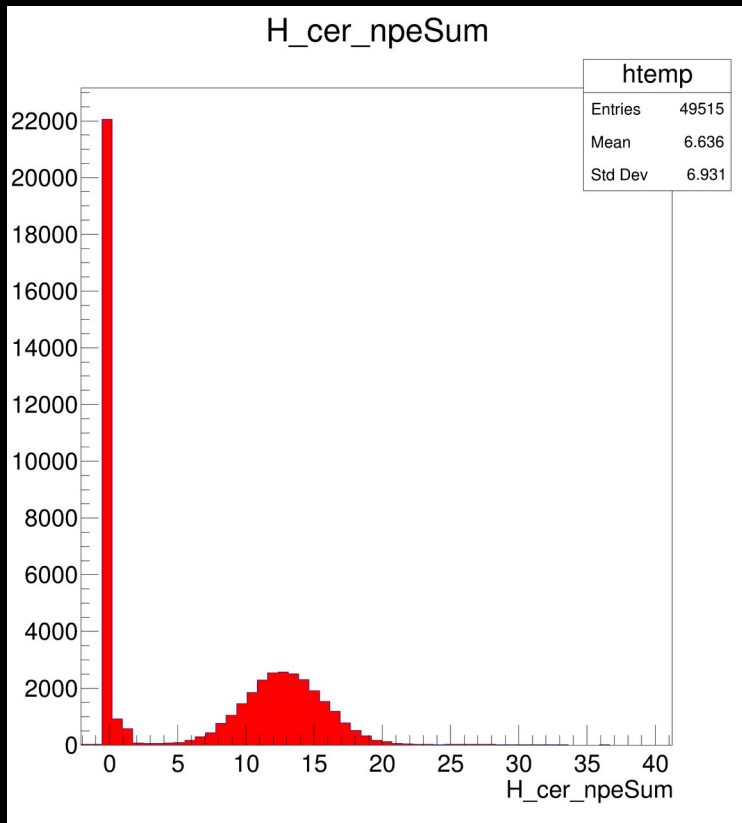


Cal Eff = 96.98 +/- 0.06

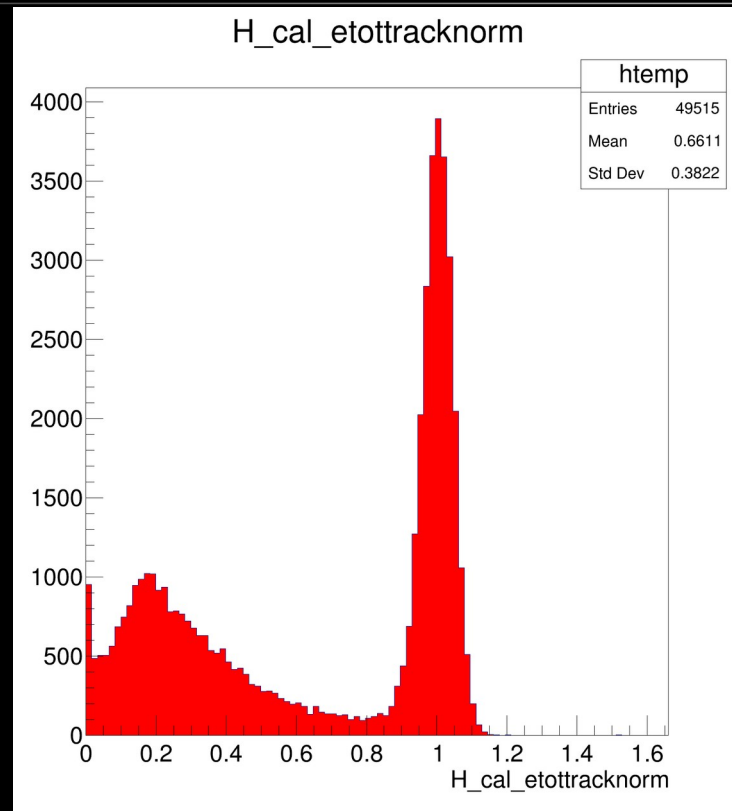
Kinematic Setting # 6

- Beam Energy = 8.2088
- $Q_2 = 4.4$
- $W = 2.74$
- Run # 7979
- HMS
 - $P = 2.328$
 - Angle = 27.27
 - S1X rate = 70.058 kHz

Run # 7979



Cer Eff = 94.92 +/- 0.06

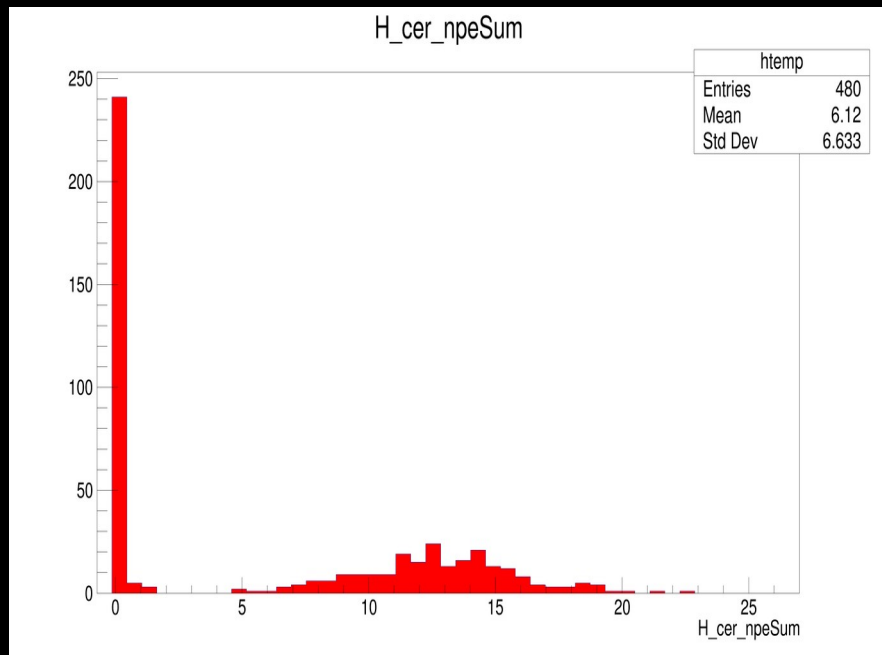


Cal Eff = 99.09 +/- 0.03

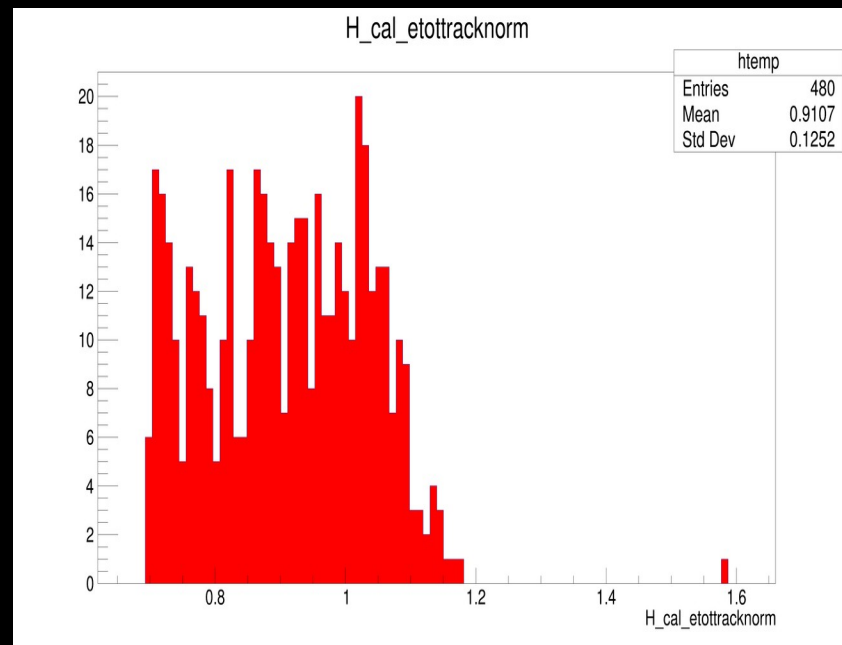
Kinematic Setting # 7

- Beam Energy = 8.2088
- $Q2 = 5.5$
- $W = 3.02$
- Run # 8255
- HMS
 - $P = 0.962$
 - Angle = 49.31
 - S1X rate = 31.804 kHz

Run # 8255



Cer Eff = 71.66 +/- 0.10



Cal Eff = 95.58 +/- 0.10

Summary

- Clean sample in Fall 2018 data (10.6 GeV)
- Contamination in Spring 2019 data (8.2 / 6.2 GeV)
- Will do a detailed PID for all setting and look at events after Cointime cut.