



Pion-LT Meeting

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PID Study

PionLT Experiment

Beam Energy (GeV)	Run period	PID Studies	Run Numbers
5.986	2021	Q2=3.85 W=2.02 x=0.55 $\theta_{SHMS}=15.79$ (Center)	13078 - 13082
8.479	2022	Q2=2.12 W=2.05 x=0.38 $\theta_{SHMS}=21.22$ (Center)	16220 - 16227
7.937	2022	Q2=3.85 W=3.07 x=0.31 $\theta_{SHMS}=5.50$ (Right)	14208 - 14249

- Cuts for Production Data.

HMS Cuts (Electrons)

$$-8 < H_gtr_dp < 8$$

$$-0.08 < H_gtr_th < 0.08$$

$$-0.045 < H_gtr_ph < 0.045$$

$$HMS_Cal_etottracknorm > 0.7$$

$$H_Cer_npeSum > 1.5$$

$$H_hod_goodstarttime == 1.0$$

SHMS Cuts (Pions)

$$-10 < P_gtr_dp < 20$$

$$-0.06 < P_gtr_th < 0.06$$

$$-0.04 < P_gtr_ph < 0.04$$

$$Ctime_epCoinTime_ROC1 \text{ (Prompt \& Rand)}$$

$$P_hod_goodstarttime == 1.0$$

- Finalized SHMS PID cuts for “**EBeam=5.986, Q2=3.85, W=2.02, x=0.55, $\theta_{SHMS}=15.79$ (Center)**”

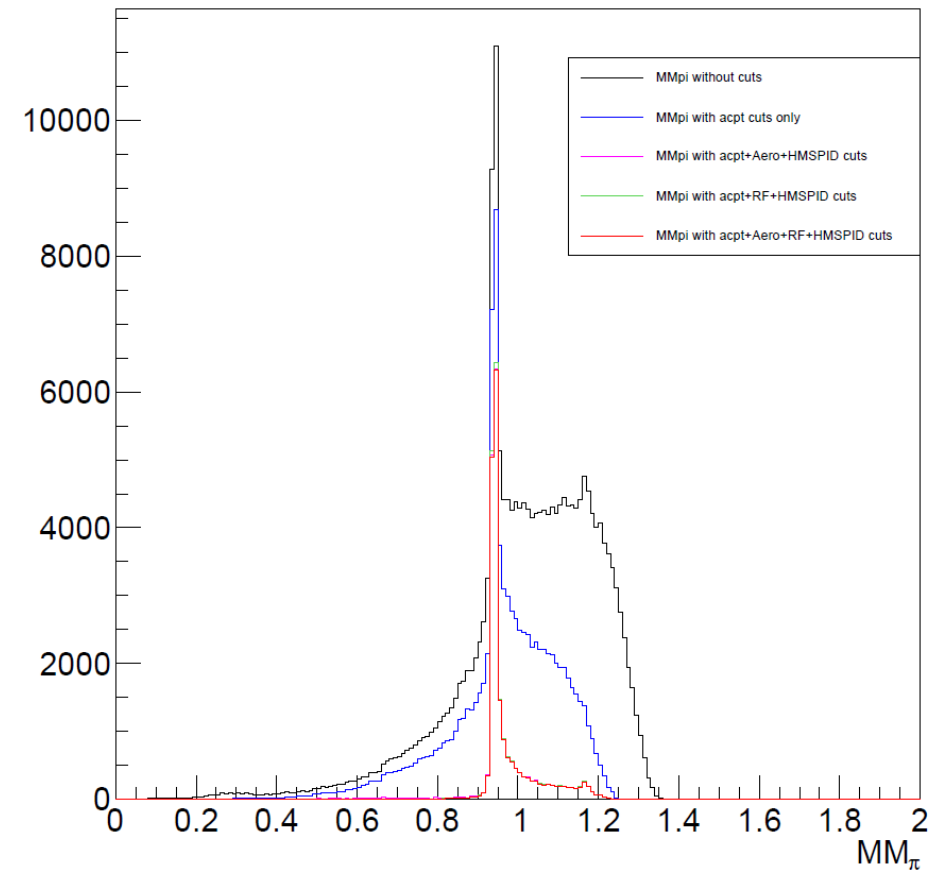
SHMS Cuts (Pions)

$P_{aero_npeSum} > 2.5$

$1.2 < P_{RF_Dist} < 3.4$

- Black peak is uncut version.
- In blue peak, only acceptance cut applied.
- In red peak, CT applied + Random subtraction + HMS PID (Cer+Cal) + SHMS PID (Aero+RF).

Missing Mass data (uncut)



- Finalized SHMS PID cuts for “**EBeam=8.479, Q2=2.12, W=2.05, x=0.38, $\theta_{SHMS}=21.22$ (Center)**”

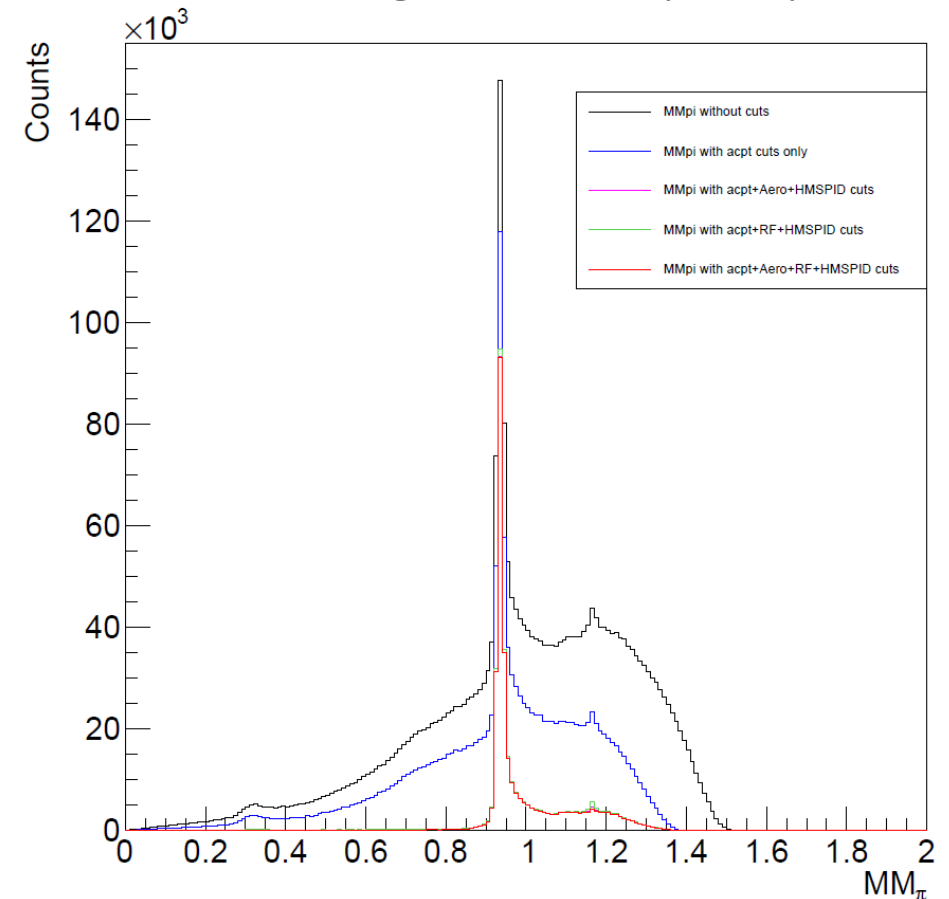
SHMS Cuts (Pions)

$P_{aero_npeSum} > 2.5$

$1.2 < P_{RF_Dist} < 3.4$

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- In red peak, CT applied + Random subtraction + HMS PID (Cer+Cal) + SHMS PID (Aero+RF).

Missing Mass data (uncut)



- Finalized SHMS PID cuts for “**EBeam=7.937, Q2=3.85, W=3.07, x=0.31, $\theta_{SHMS}=5.50$ (Right)**”

SHMS Cuts (Pions)

$P_{aero_npeSum} > 2.5$

$0.4 < P_{RF_Dist} < 1.6$

- Updated CT and RF offsets to move peaks to center in the standard.kinematics for this setting.
- Black peak is uncut version.
- In blue peak, only acceptance cut applied.
- In red peak, CT applied + Random subtraction + HMS PID (Cer+Cal) + SHMS PID (Aero+RF).

Missing Mass data (uncut)

