



Update on PionLT Experiment

Mr. Muhammad Junaid
Ph.D. Student
Department of Physics,
University of Regina, Canada

- Setup Replay scripts for PionLT data.
- Path: /u/group/c-pionlt/USERS/junaid/hallc_replay_lt/UTIL_PION/scripts/replay/PionLT
- Folder contains 7 scripts:
 - FullReplay_PionLT_HeeP_Coin.C
 - FullReplay_PionLT_HeeP_Sing_HMS.C
 - FullReplay_PionLT_HeeP_Sing_SHMS.C
 - FullReplay_PionLT_Luminosity.C
 - FullReplay_PionLT_Luminosity_Coin.C
 - FullReplay_PionLT_Phys_Prod.C
 - FullReplay_PionLT_Phys_Prod_pTRIG6.C

- Setup Batch scripts for PionLT data.
- Path: /u/group/c-pionlt/USERS/junaid/hallc_replay_it/UTIL_BATCH/batch_scripts/run_batch_FullReplay_PionLT.sh
- Path: /u/group/c-pionlt/USERS/junaid/hallc_replay_it/UTIL_BATCH/Analysis_Scripts/FullReplay_PionLT_Batch.sh
- Script take 3 arguments;
- Run type (Prod/Lumi/LumiCoin/HeePSingHMS/HeePSingSHMS/HeePCoin/pTRIG6)
- Run number
- No of Events

- During replays faced some issues.
- Symlink/Typo mistake/duplicate run numbers

```
16632 - 16632
g_ctp_parm_filename = "DBASE/COIN/Offline_PionLT2022/OfflinePionLT_16632-16632.param"
g_ctp_kinematics_filename = "DBASE/COIN/DB_PionLT/standard_PionLT.kinematics"

16633 - 16633
g_ctp_parm_filename = "DBASE/COIN/Offline_PionLT2022/OfflinePionLT_16633-16633.param"
g_ctp_kinematics_filename = "DBASE/COIN/DB_PionLT/standard_PionLT.kinematics"

16634 - 16634
g_ctp_parm_filename = "DBASE/COIN/Offline_PionLT2022/OfflinePionLT_16634-16634.param"
g_ctp_kinematics_filename = "DBASE/COIN/DB_PionLT/standard_PionLT.kinematics"
```

```
-rwxrwxr-x 1 junaid c-pionlt 3455 Dec 26 20:58 OfflinePionLT_16631-16631.param
-rwxrwxr-x 1 junaid c-pionlt 3455 Dec 26 20:58 OfflinePionLT_16632-16632.param
-rwxrwxr-x 1 junaid c-pionlt 3458 Dec 26 20:58 OfflinePionLT_16632-16633.param
-rwxrwxr-x 1 junaid c-pionlt 3458 Dec 26 20:58 OfflinePionLT_16633-16634.param
```

- Fixed all issues.
- Full replay of PionLT data is completed
- Replay output files / report output are placed in cache.
- Path: /lustre19/expphy/cache/hallc/c-pionlt/analysis
 - PionLT_Fullreplay_Analysis_Files_Pass1_2021
 - PionLT_Fullreplay_Analysis_Files_Pass1_2022

- Cuts used for Tracking Efficiency Study;

SHMS Cuts for Tracking Efficiency Study

P.hod.goodscinhit == 1

P.hod.betanotrack > 0.5 && P.hod.betanotrack < 1.4

P.hod.goodstarttime == 1

P.hgcer.npeSum > 1.0

P.aero.npeSum > 1.5

HMS Cuts for Tracking Efficiency Study

H.hod.goodscinhit == 1

H.hod.betanotrack > 0.8 && H.hod.betanotrack < 1.3

H.hod.goodstarttime == 1

H.cer.npeSum > 1.5

H.cal.etotnorm > 0.7

- As first Full replay is finished, I have output report files for each run.
- Working on the script to make the csv file and plots for tracking efficiency study

THANK YOU