

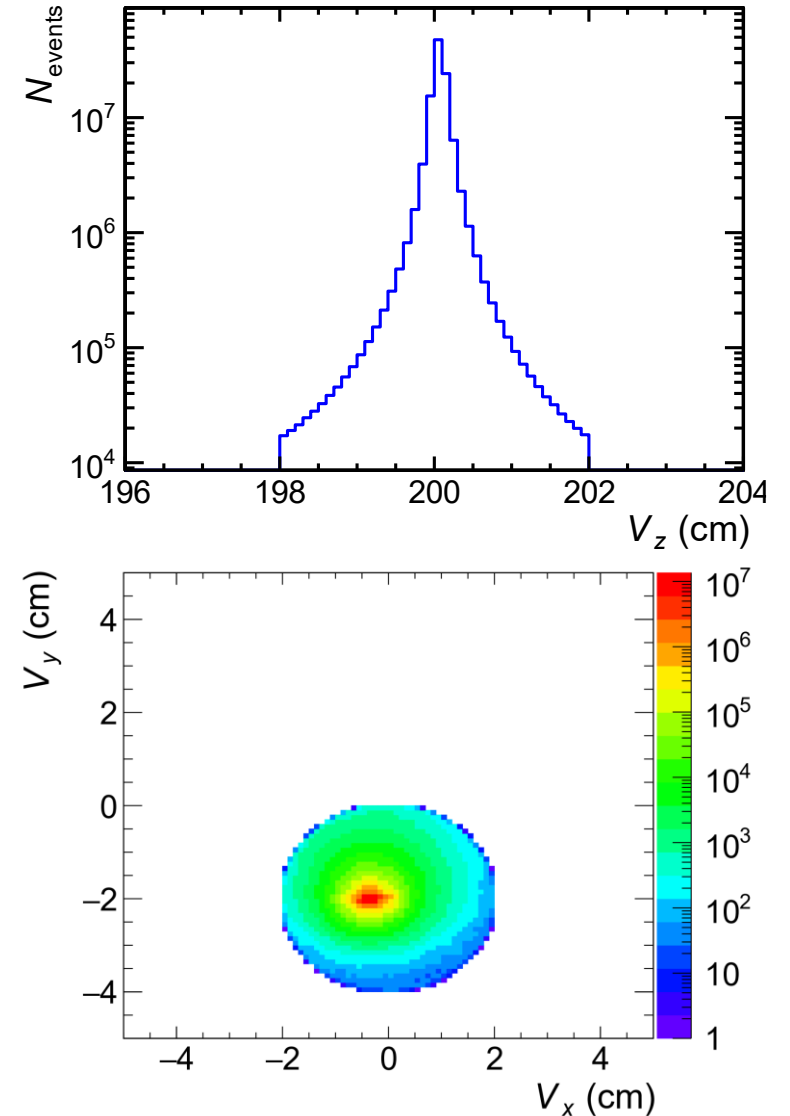
Net-proton fluctuations at 3.54 GeV

Fan Si

Apr. 11th, 2022

Dataset

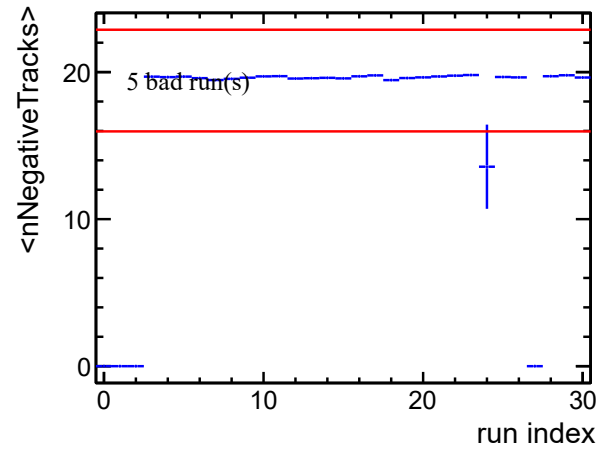
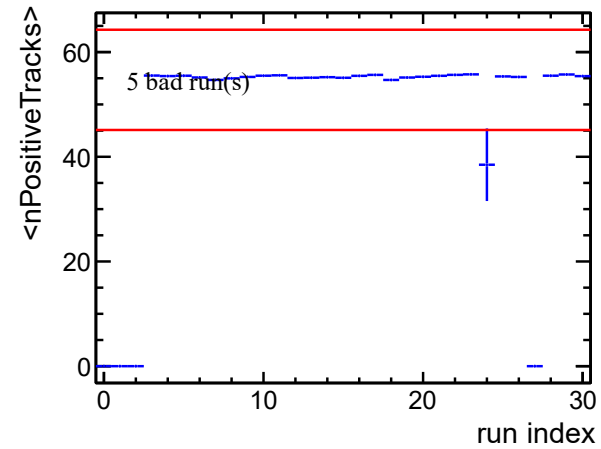
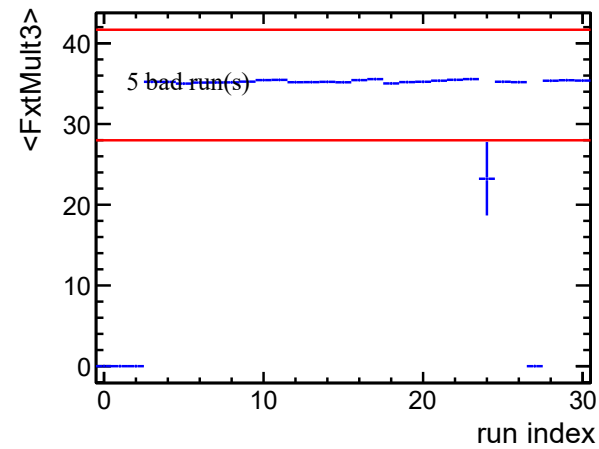
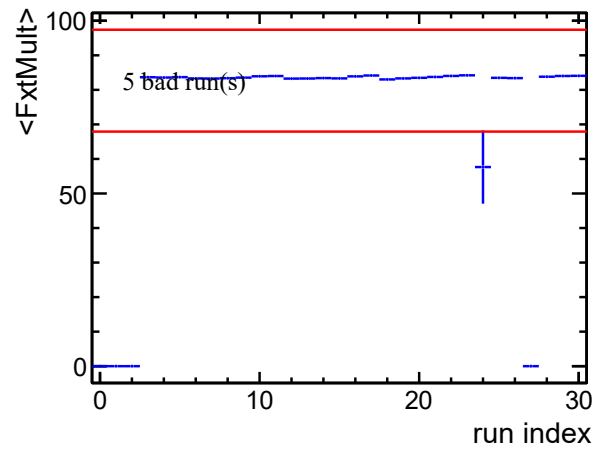
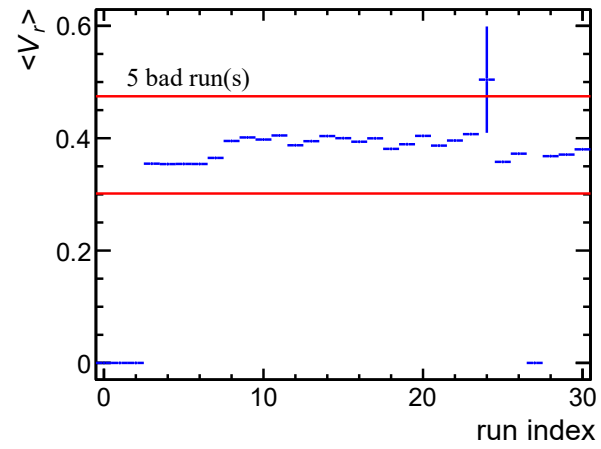
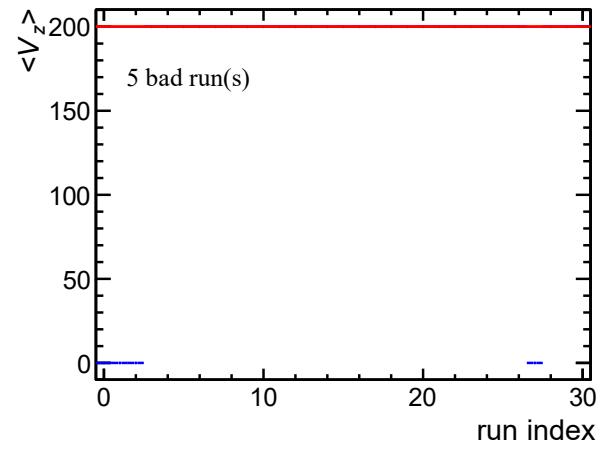
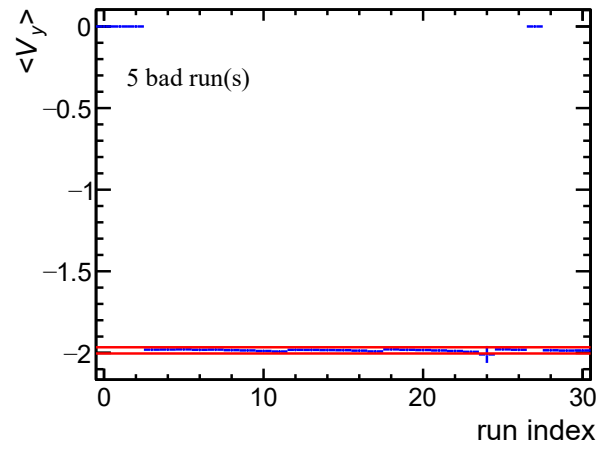
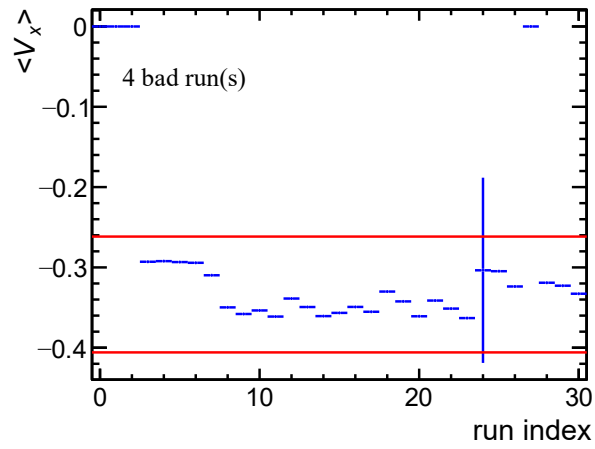
- Au+Au @ 3.54 GeV (5.75 GeV FXT)
- Trigger setup: production_5p75GeV_fixedTarget_2020
- Stream: st_physics(_adc)
- Production: P21id
- Library: SL21e?
 - FXT_2019 P21id SL21d
 - AuAu200_2019 P22ia SL22a
- Run ID: 20355020 – 21045011 (31 runs)
- Events: 1.25×10^8 ?



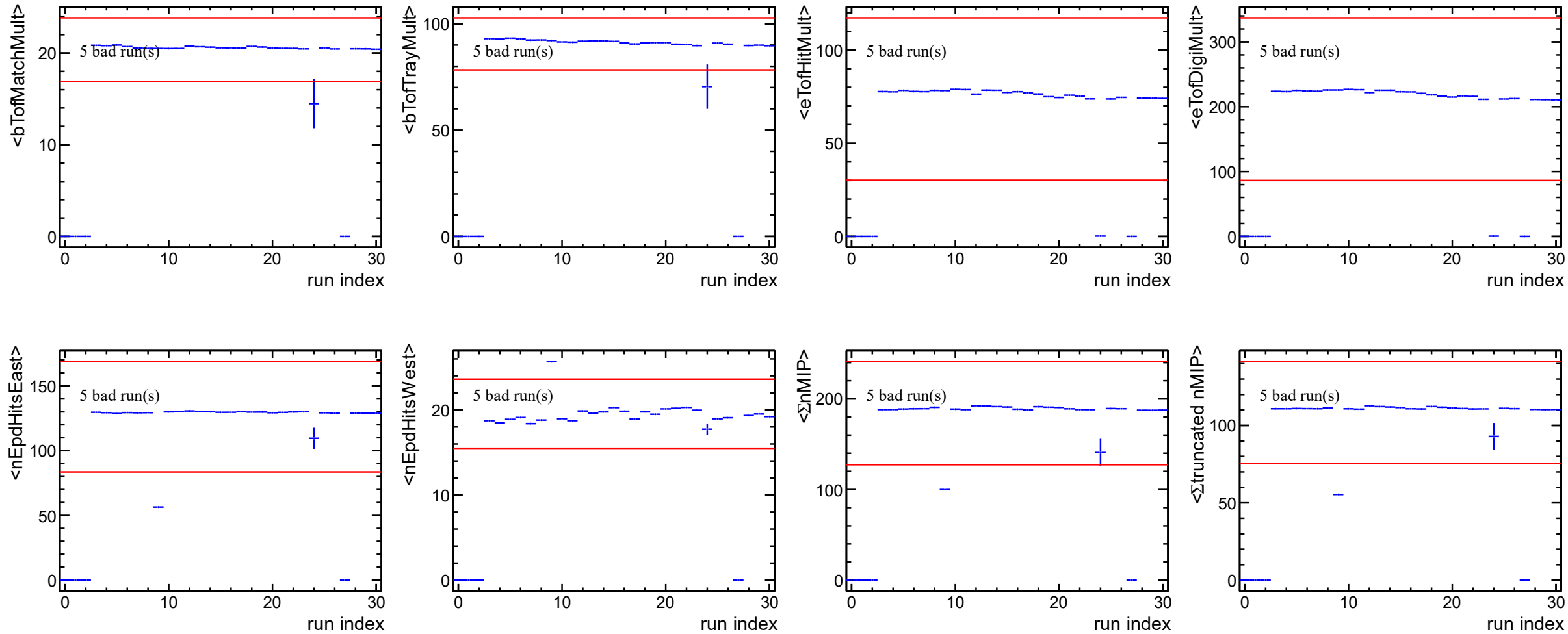
Run-by-run QA cuts

- Trigger ID
 - 720007 (epde-or-bbce-or-vpde-tof1-etof)
- Event cuts:
 - $198 \text{ cm} < V_z < 202 \text{ cm}$
 - $|V_r| < 2 \text{ cm}$, with center $(0, -2) \text{ cm}$
- Remove empty bins and $3\text{-}\sigma$ outliers
- Empty bins are not taken into account in σ calculation
- Bad run ID [7]: 20355020, 20355021, 21044023, 21044027, 21044031, 21045005, 21045008
- Track cuts
 - Primary
 - $|gDca| < 3 \text{ cm}$
 - $n\text{HitsFit} > 10$
 - $n\text{HitsFit}/n\text{HitsPoss} > 0.52$
 - $n\text{HitsDedx} > 5$

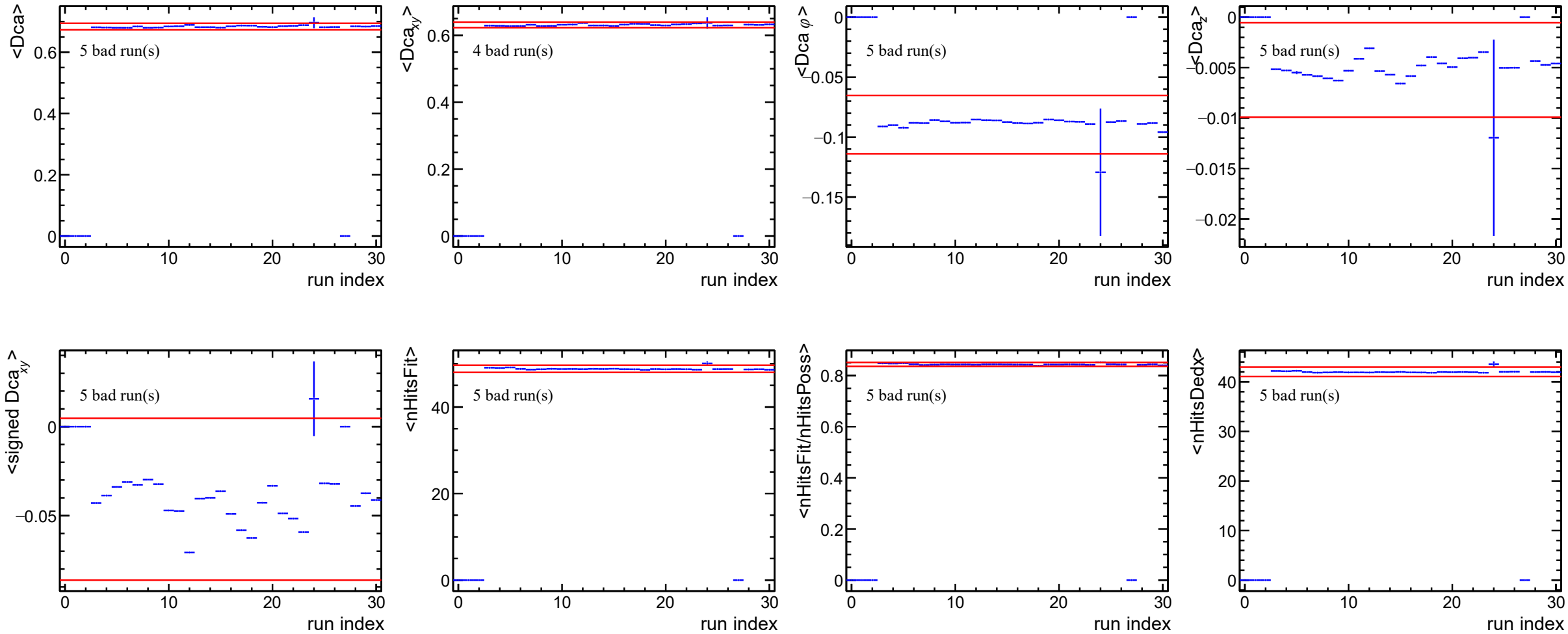
Run-by-run QA plots



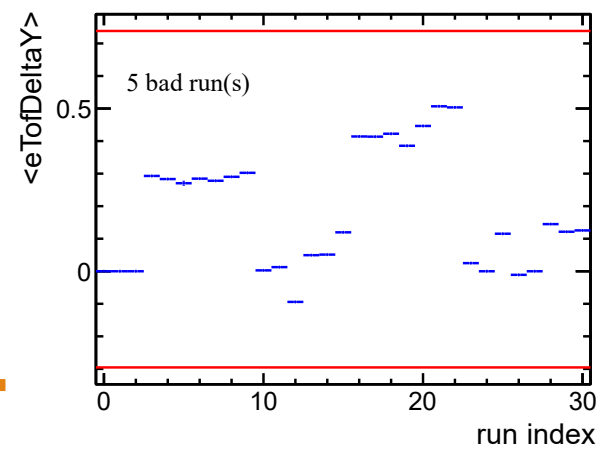
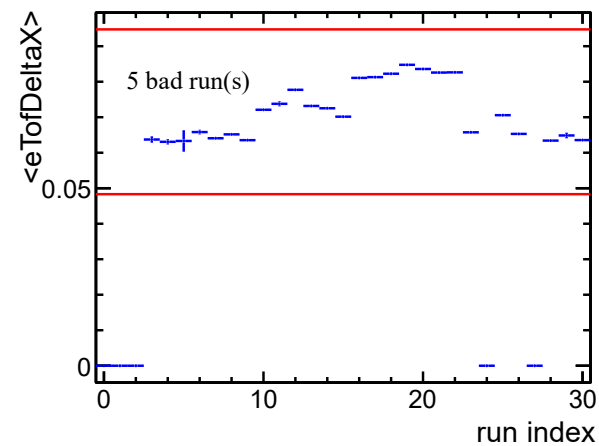
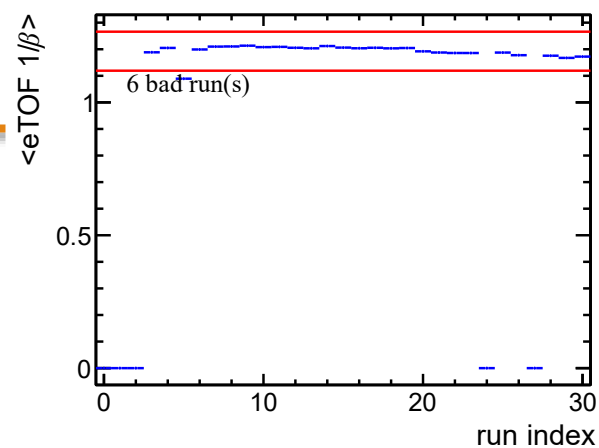
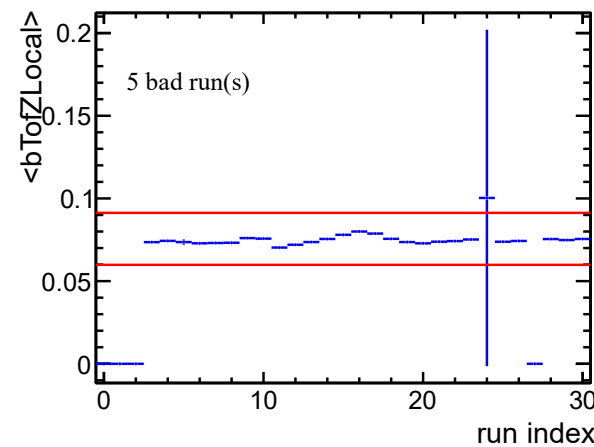
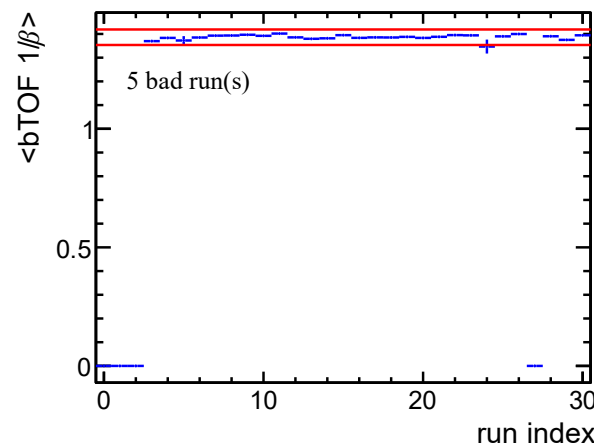
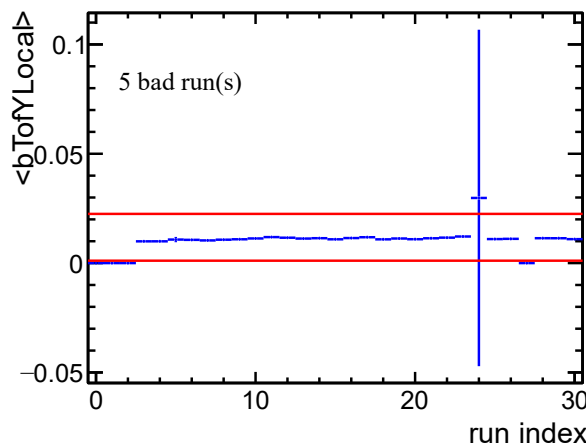
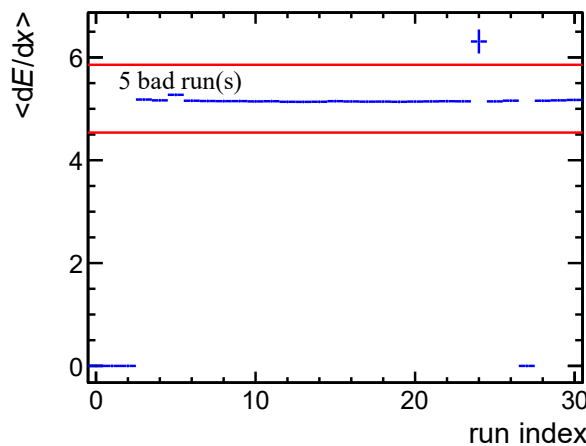
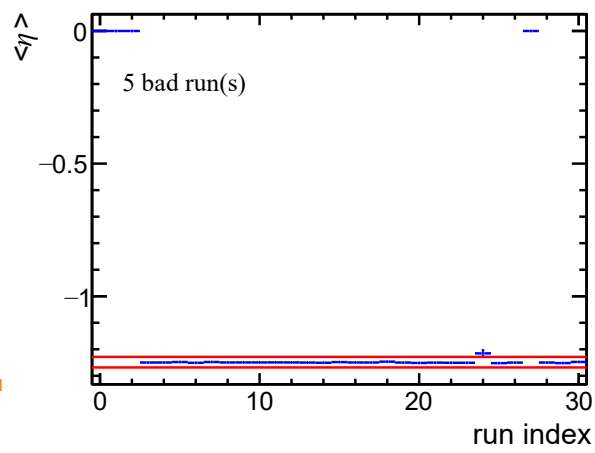
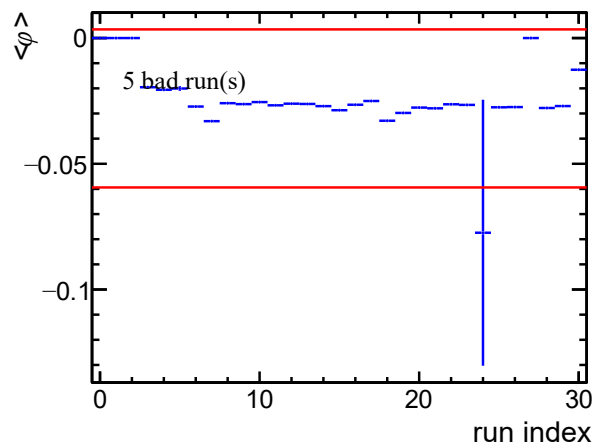
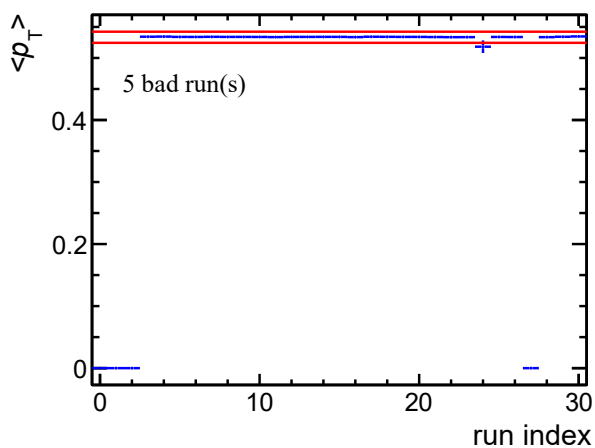
Run-by-run QA plots



Run-by-run QA plots

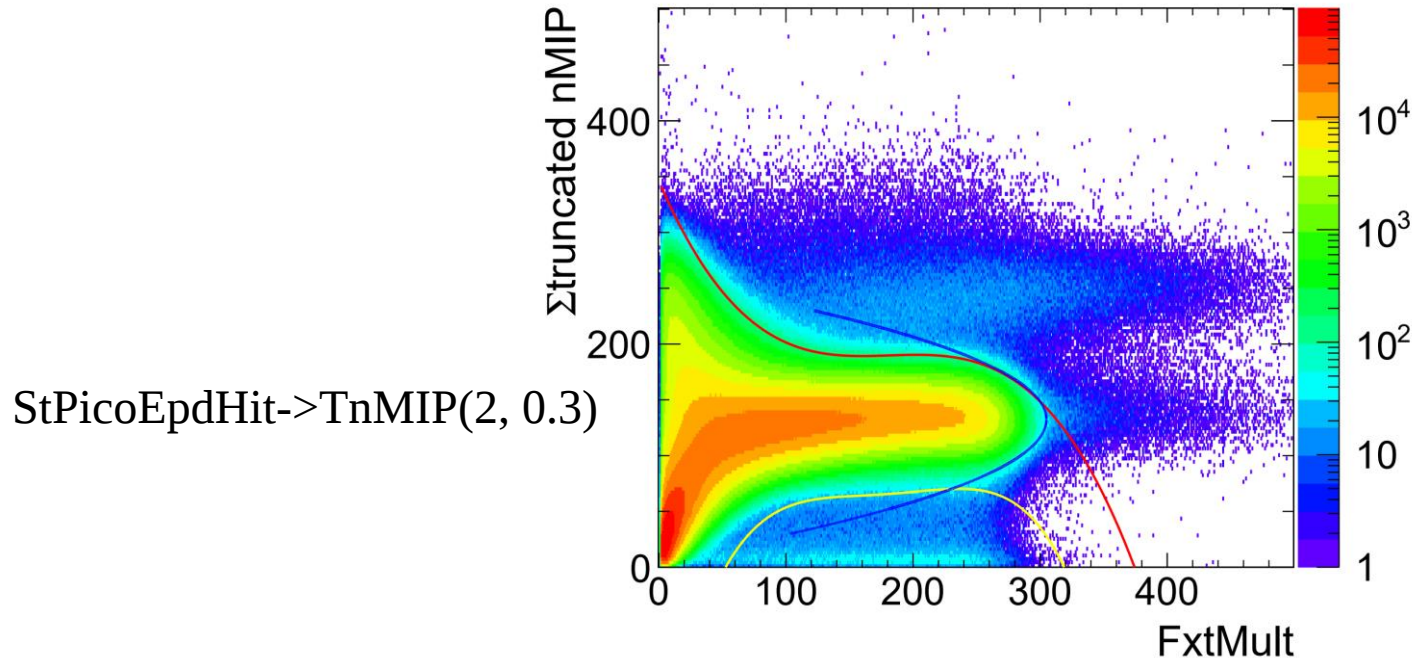


Run-by-run QA plots



Pileup event rejection

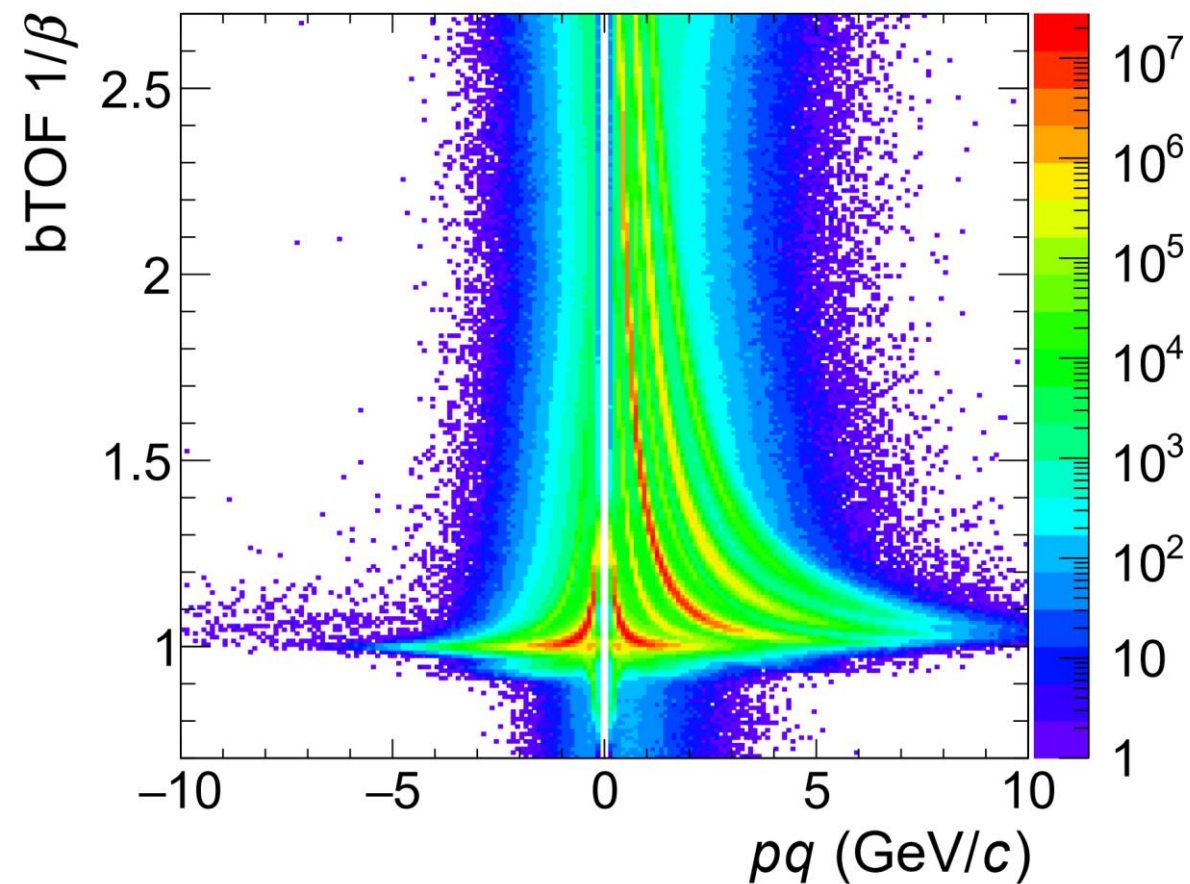
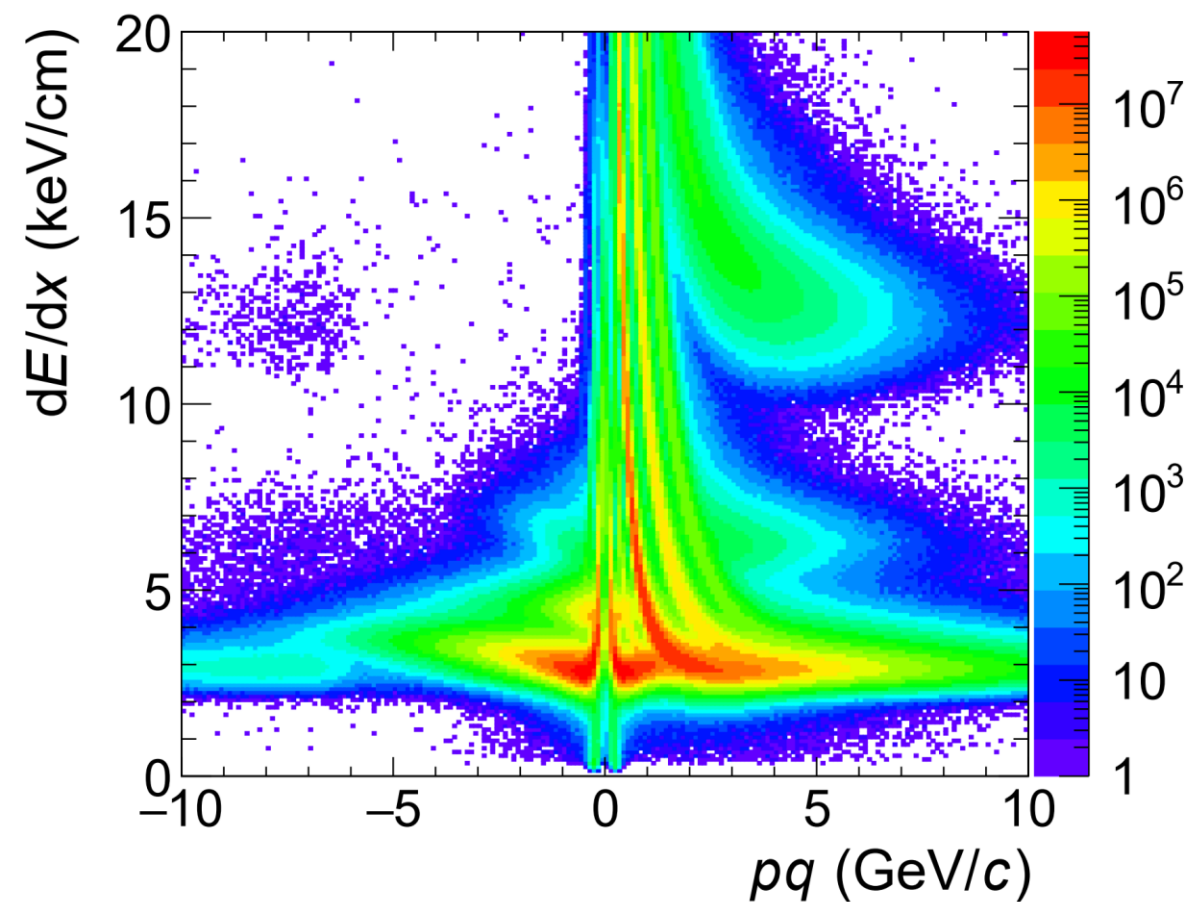
- (Red) $\text{SumTnMIP} < \text{pol3}(\text{FxtMult}): 3.463507\text{e}+02, -2.667239\text{e}+00, 1.492184\text{e}-02, -2.743280\text{e}-05$
- (Yellow) $\text{SumTnMIP} > \text{pol4}(\text{FxtMult}): -1.932547\text{e}+02, 5.780245\text{e}+00, -4.894189\text{e}-02, 1.835858\text{e}-04, -2.539630\text{e}-07$
- (Blue) $\text{FxtMult} < [0] * \text{TMath}::\text{Gaus}(\text{SumTnMIP}, [1], [2]) + [3]: 9.394418\text{e}+04, 1.324599\text{e}+02, 1.563239\text{e}+03, -9.363926\text{e}+04, \text{ for FxtMult} > 200$



PID plots

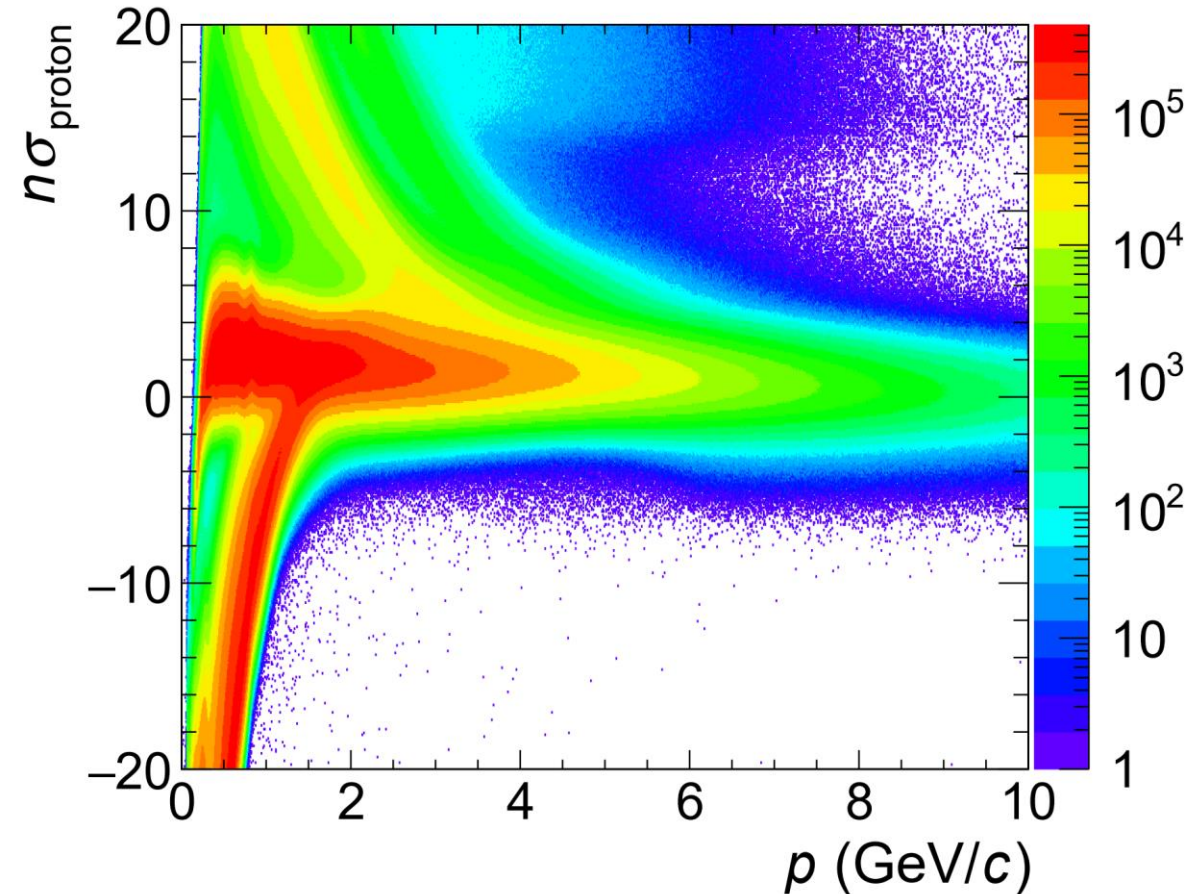
○ TPC dE/dx

○ bTOF $1/\beta$

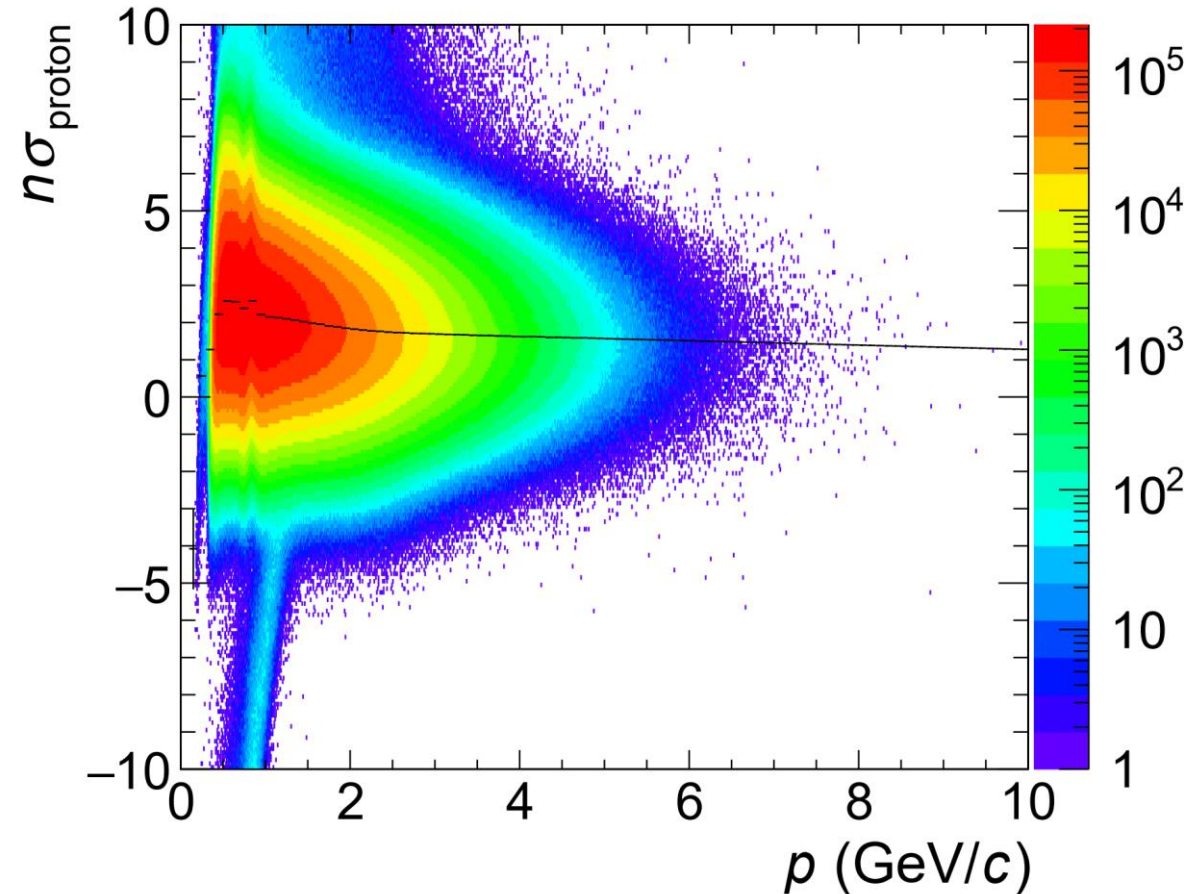


TPC PID check

- No bTOF PID



- bTOF $0.73 \text{ GeV}^2/c^4 < m^2 < 1.03 \text{ GeV}^2/c^4$
- Gaussian fit & $\langle n\sigma_{\text{proton}} \rangle$ shift in p bins

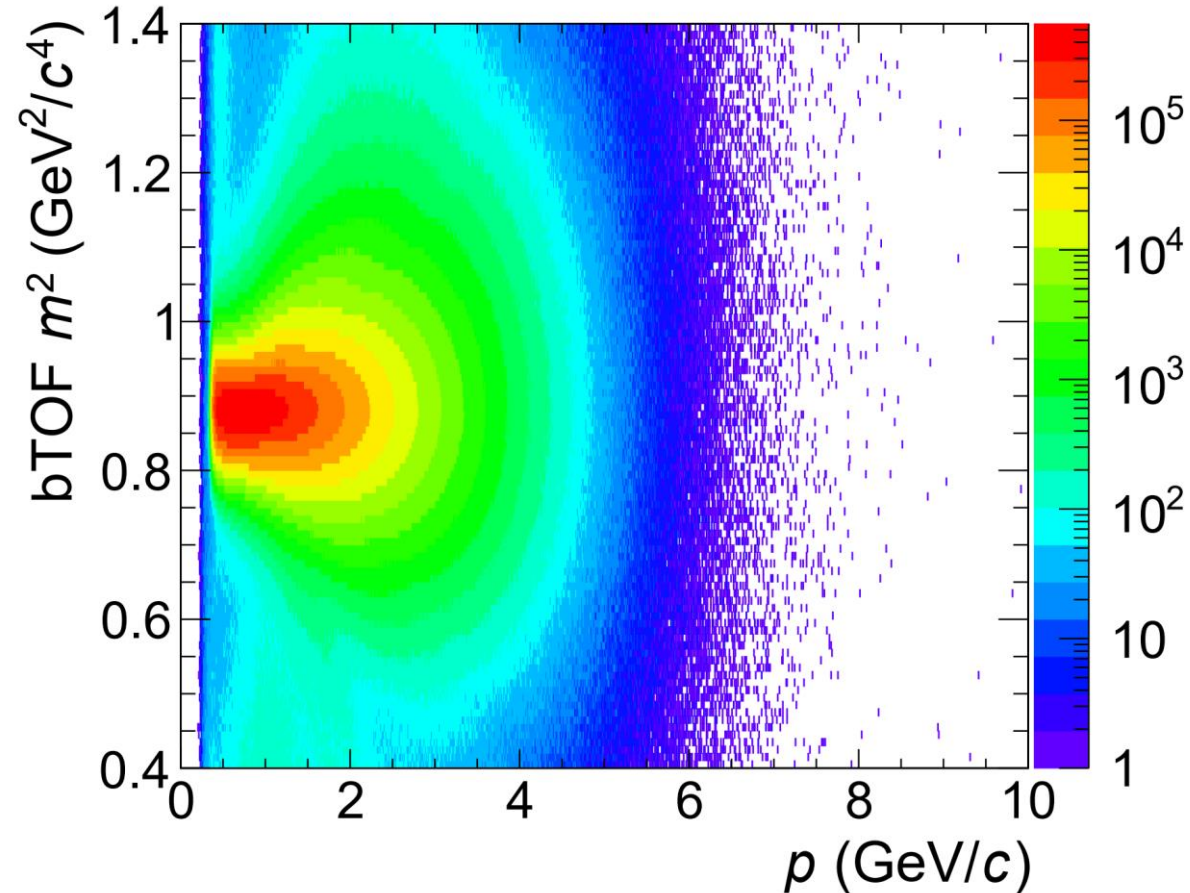
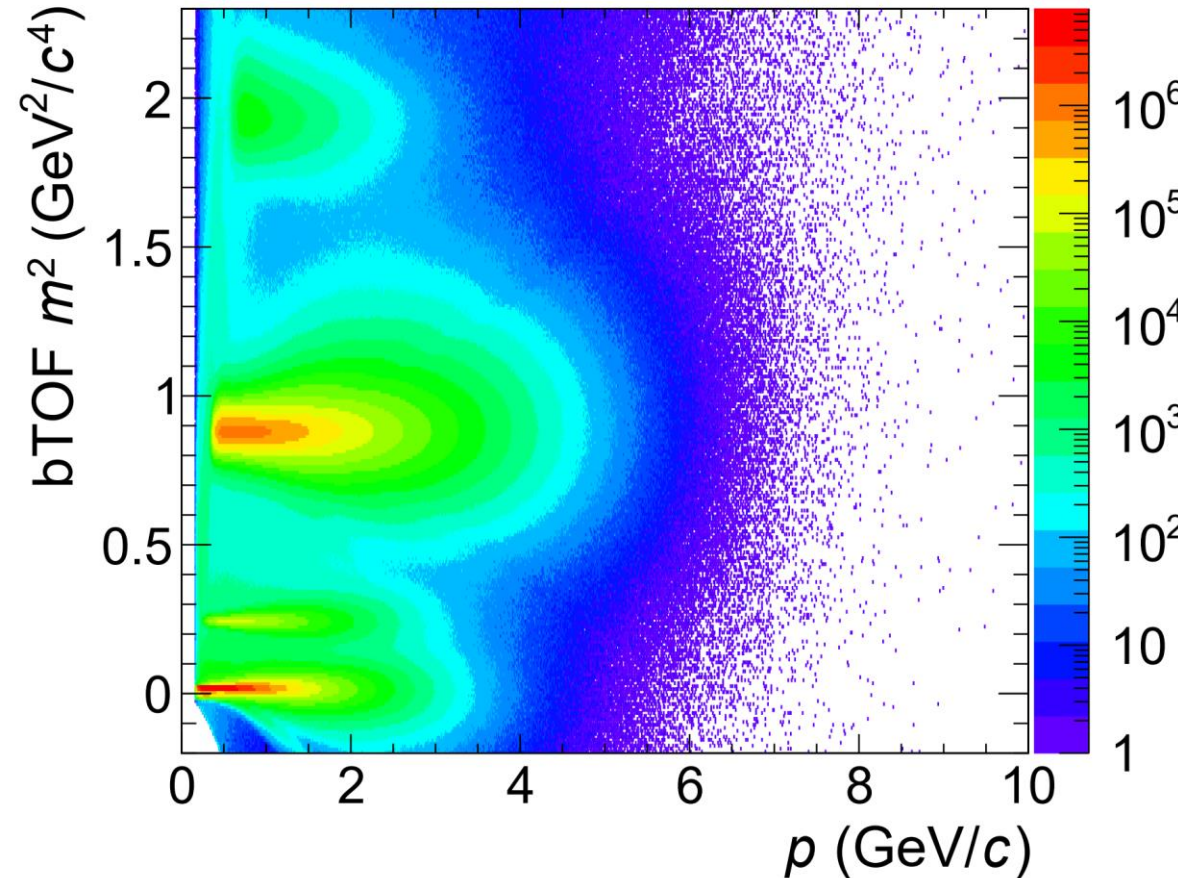


bTOF PID check

- No TPC PID

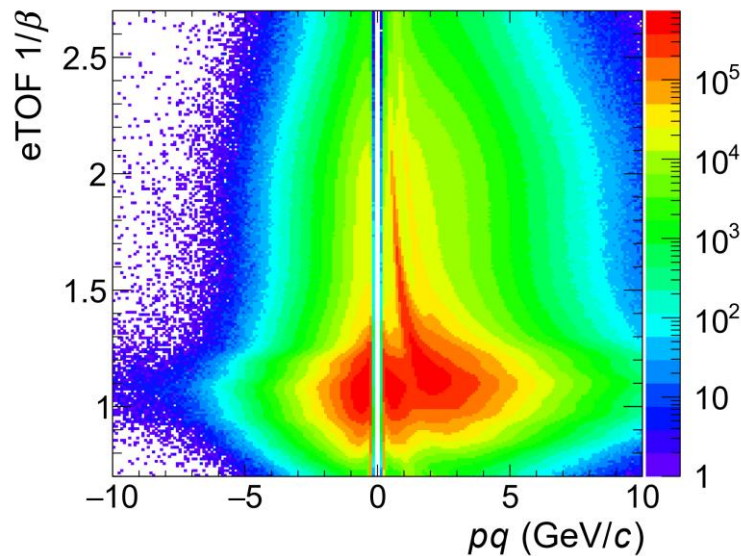
- TPC $|n\sigma_{\text{proton}} - 2.15| < 1$

- No mean shift required

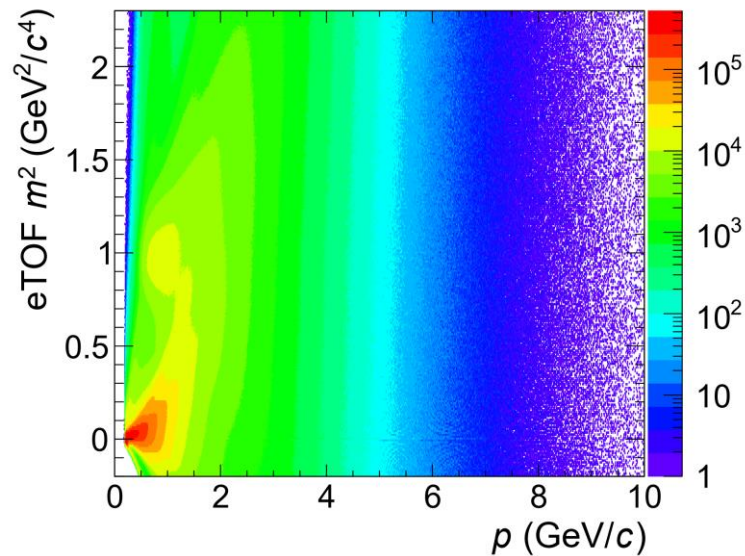


eTOF PID check

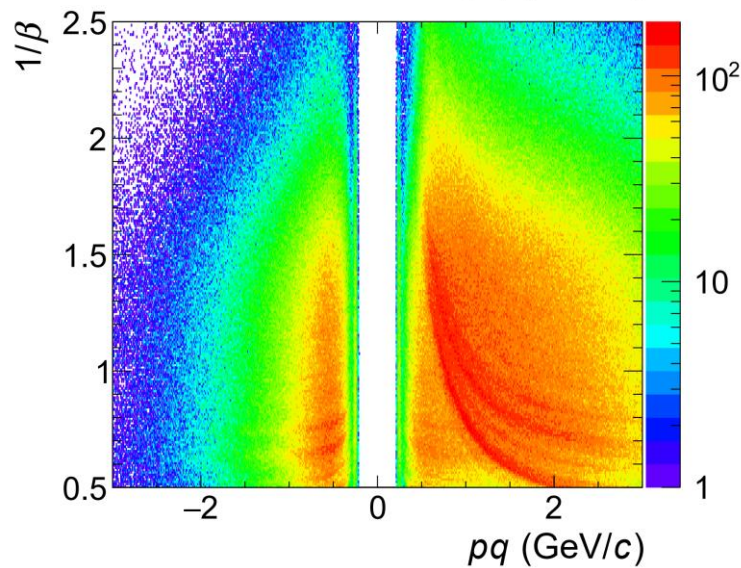
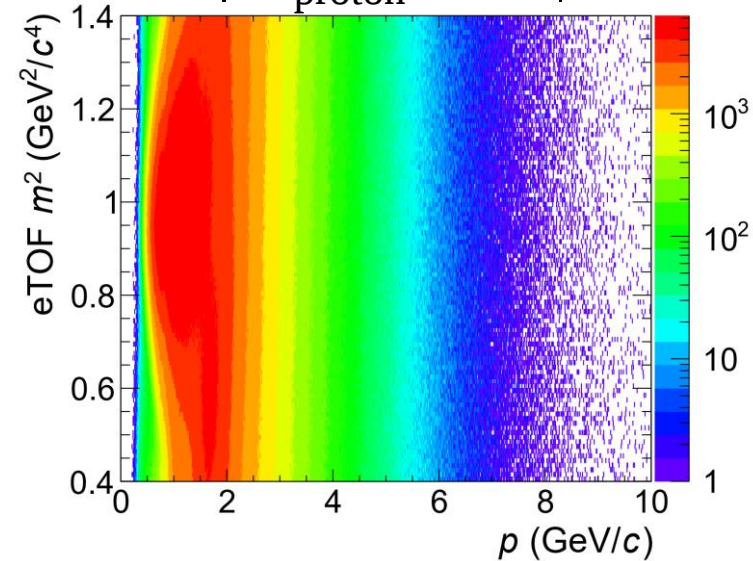
○ No TPC PID



○ No TPC PID



○ TPC $|n\sigma_{\text{proton}} - 2.15| < 1$

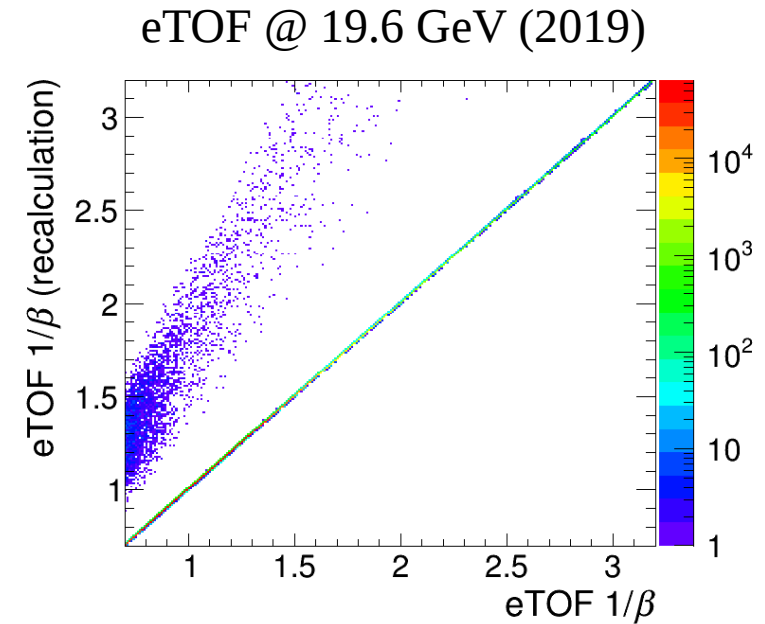
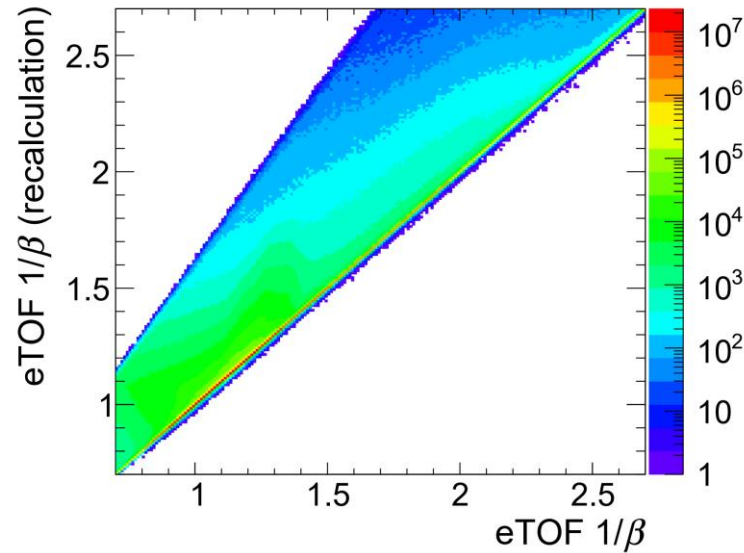
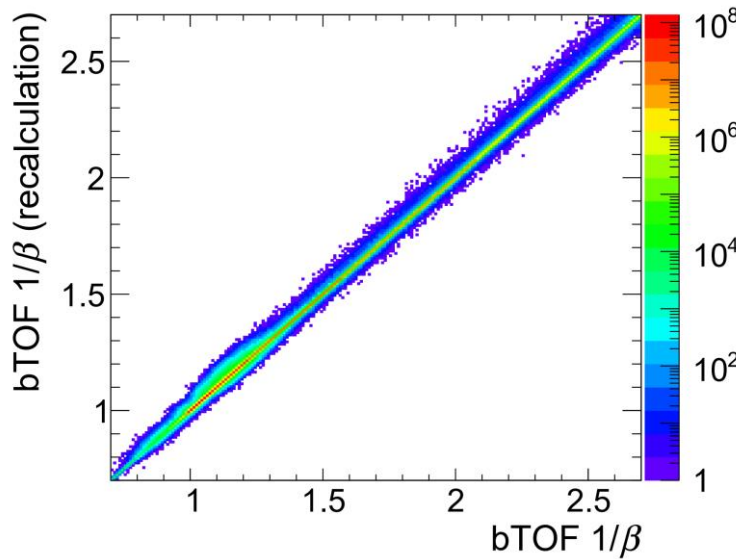


- eTOF is not available now
- Further calibration required

eTOF @ 3.22 GeV
(FXT 4.59 GeV 2019)

TOF β recalculation

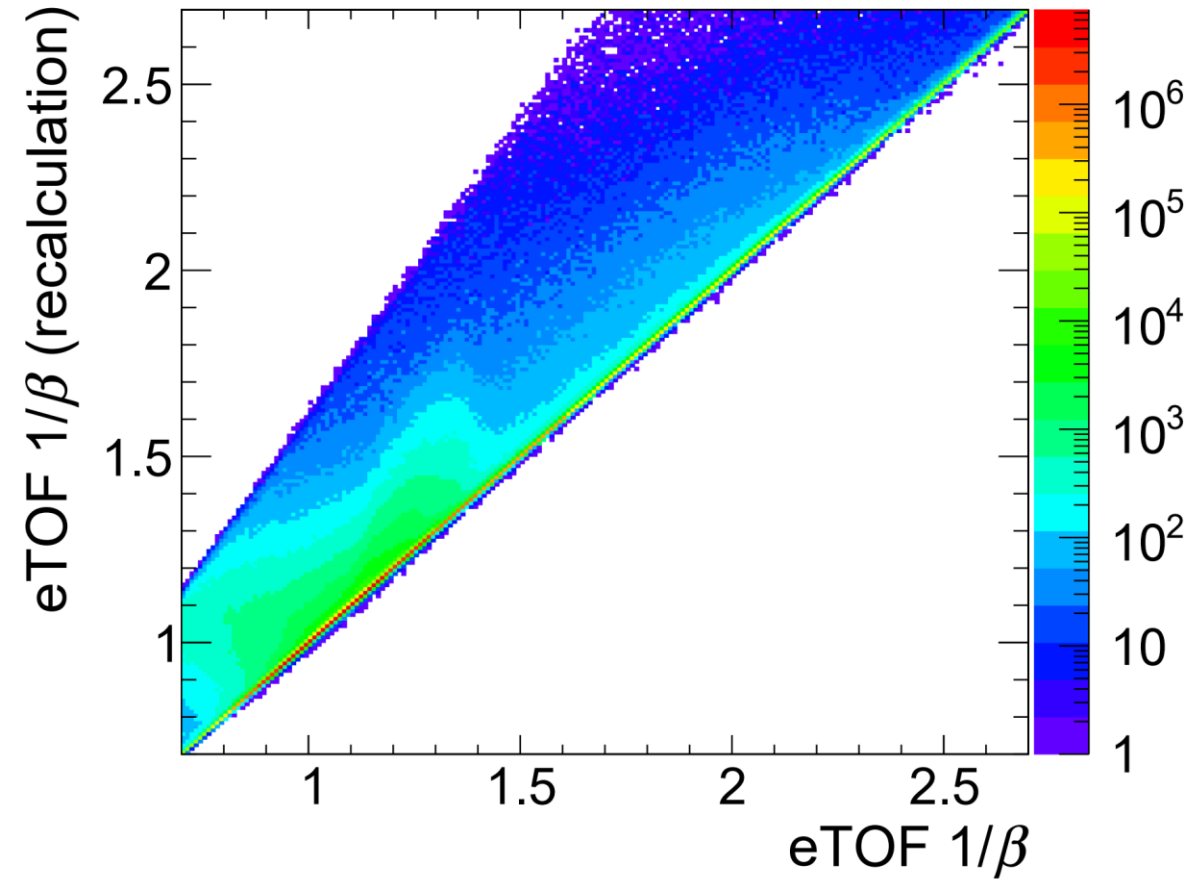
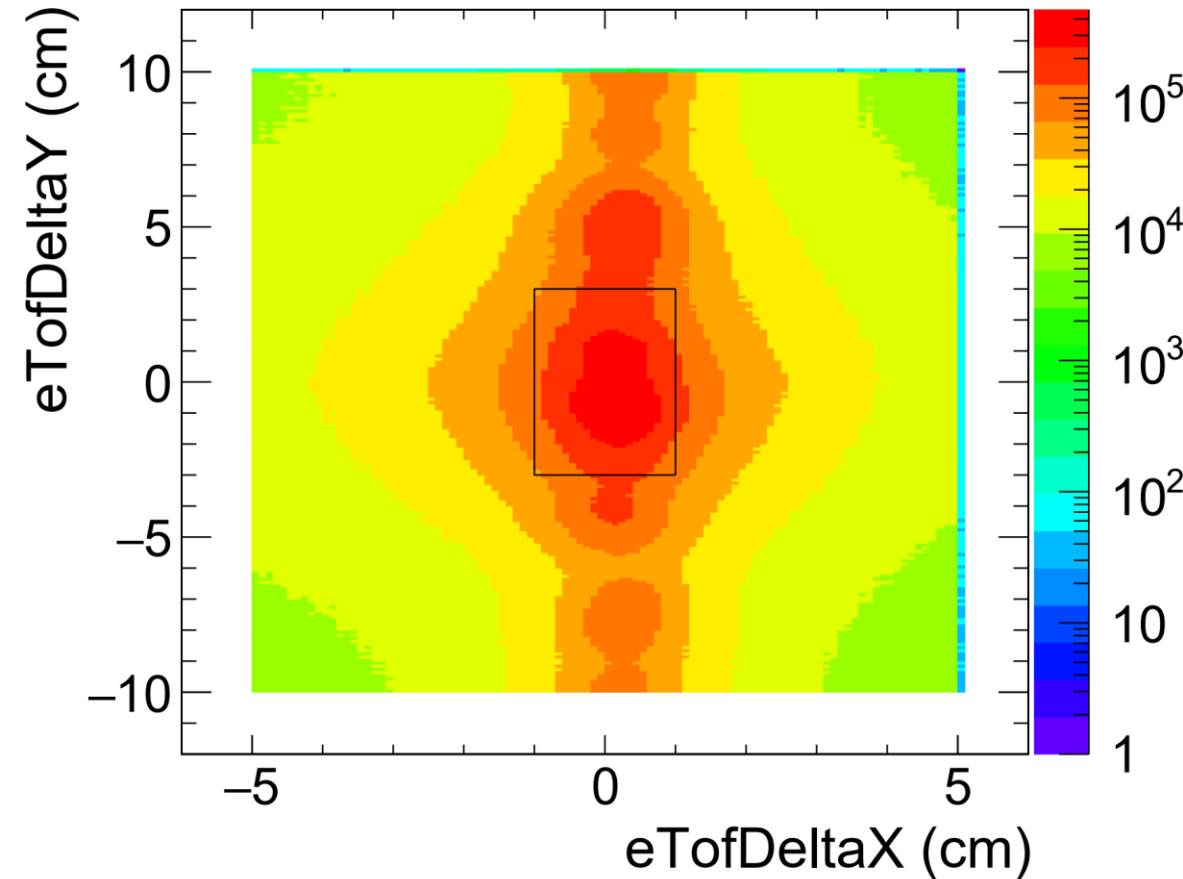
- $\text{bTOF } \beta = \text{tofPathLength}(\text{origin}, \text{bTofHitPos}, \text{helix}(\text{bField}).\text{curvature}) / (\text{bTofT} * \text{C_C_LIGHT} / 1.\text{e9});$
- $\text{eTOF } \beta = \text{tofPathLength}(\text{origin}, \text{eTofCrossingPos}, \text{helix}(\text{bField}).\text{curvature}) / (\text{eTofT} * \text{C_C_LIGHT} / 1.\text{e9})$



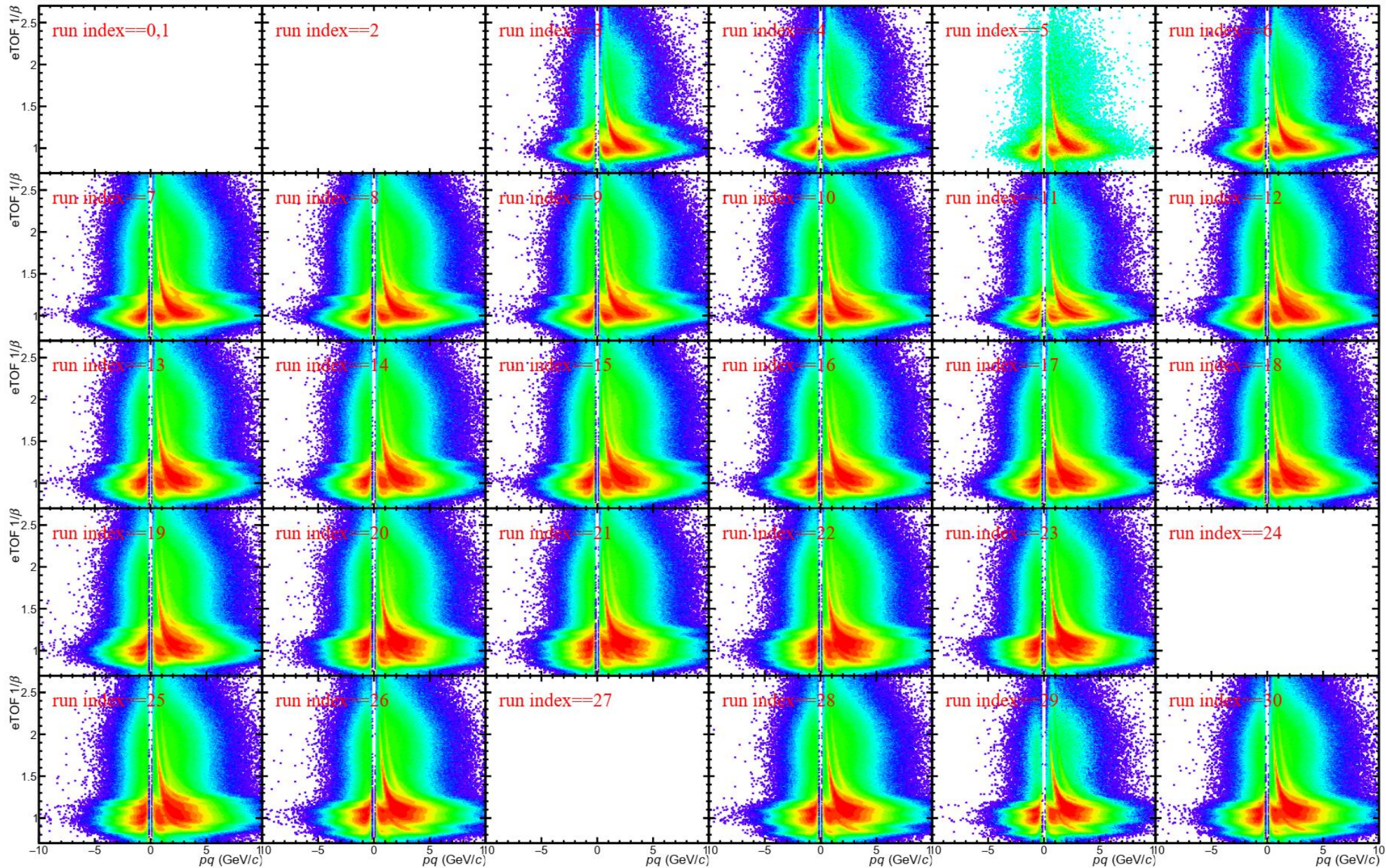
eTOF PID check

- DeltaX(Y): difference between track intersection and eTOF hit in local X(Y) coordinate (cm) across strips

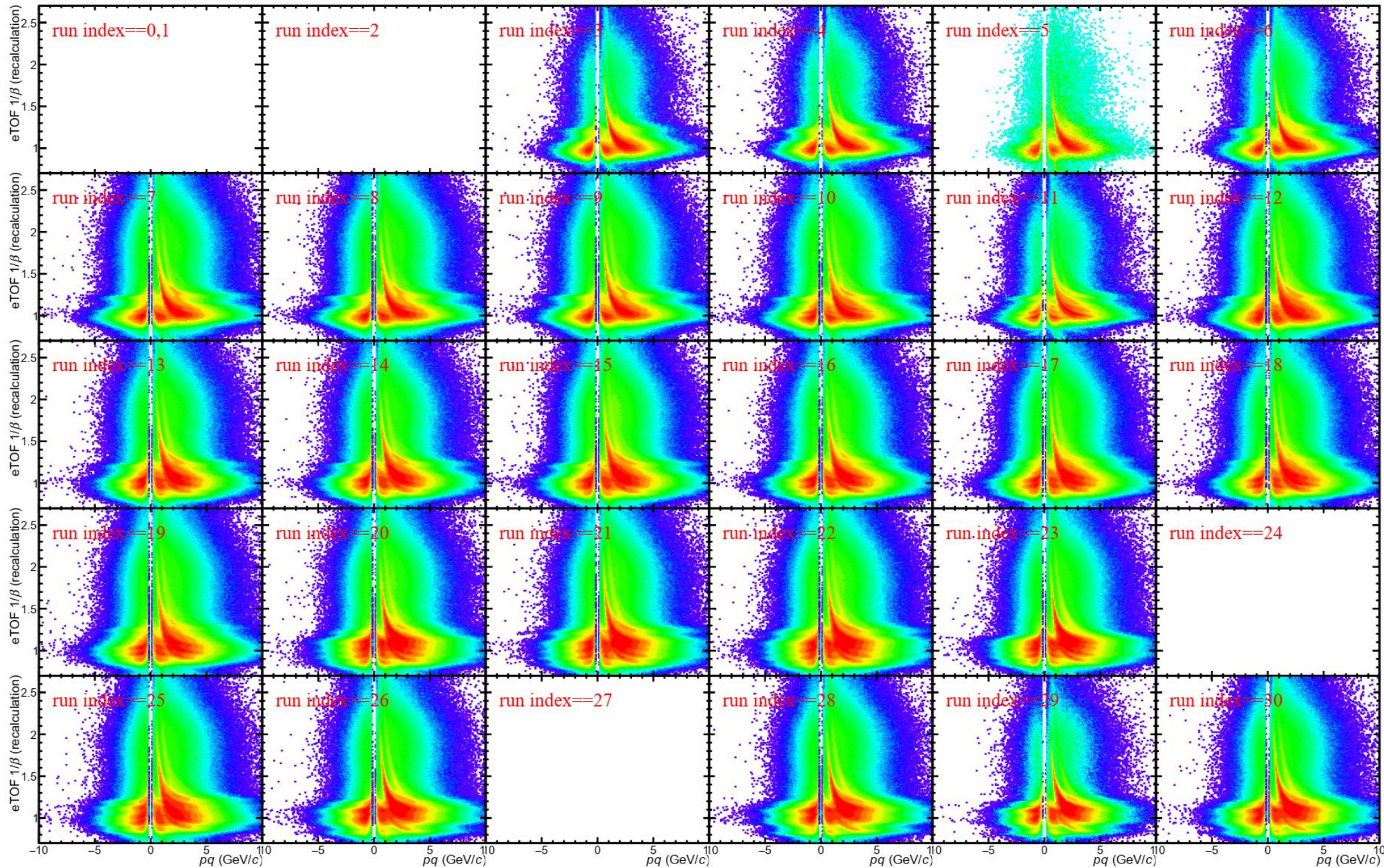
- $|\text{DeltaX}| < 1$
- $|\text{DeltaY}| < 3$



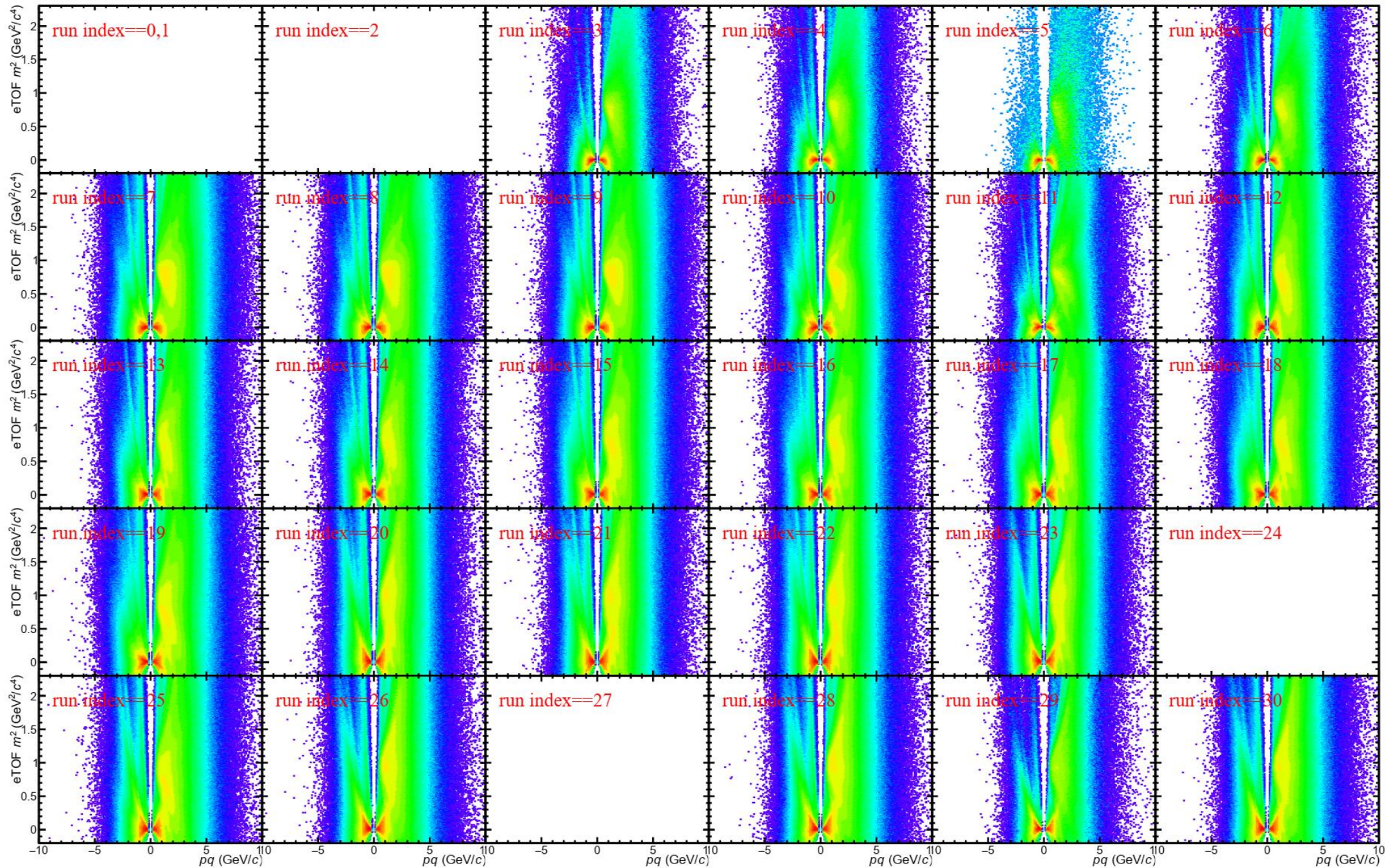
eTOF PID check (Δ cut)



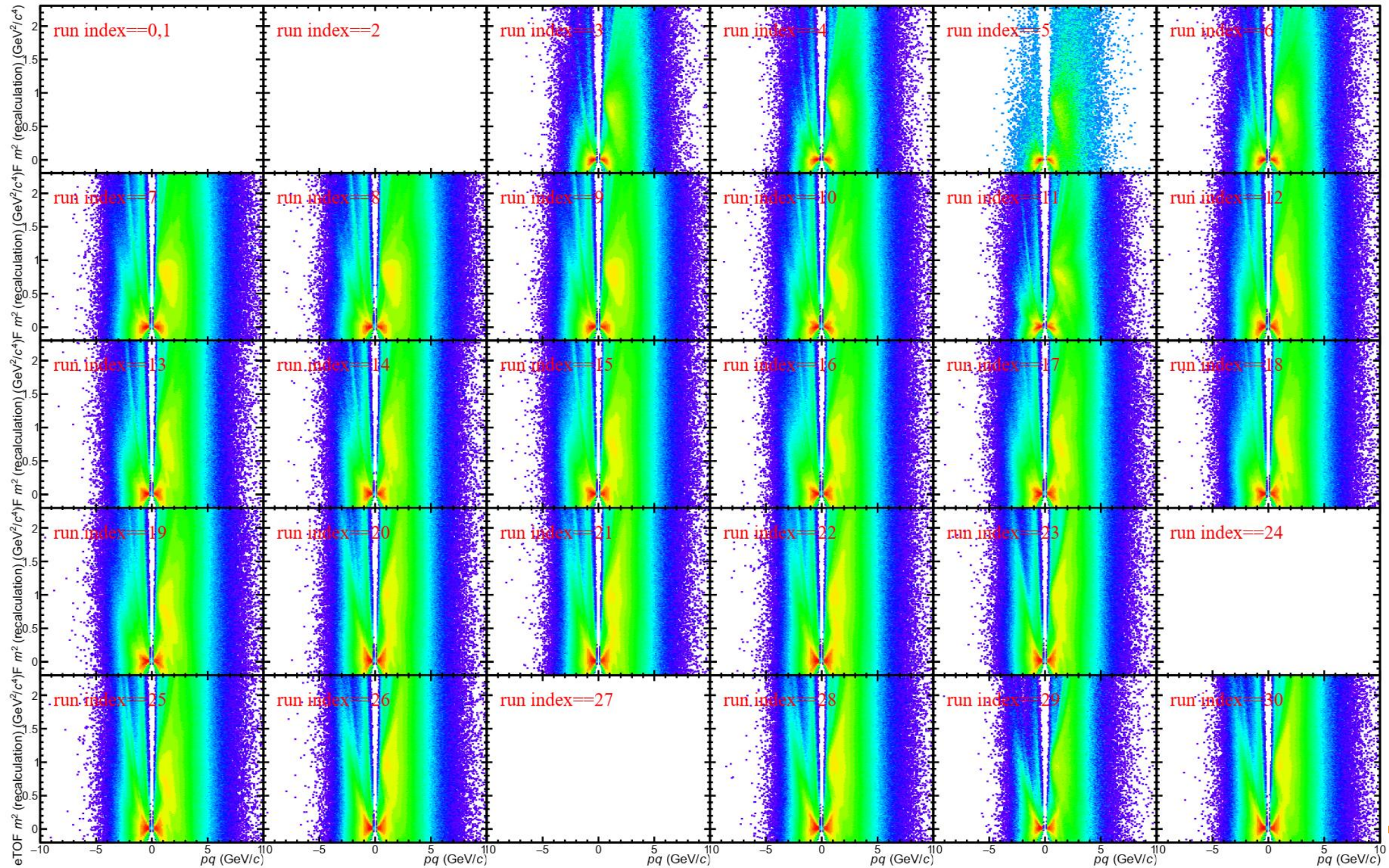
eTOF PID check (Δ cut)



eTOF PID check (Δ cut)

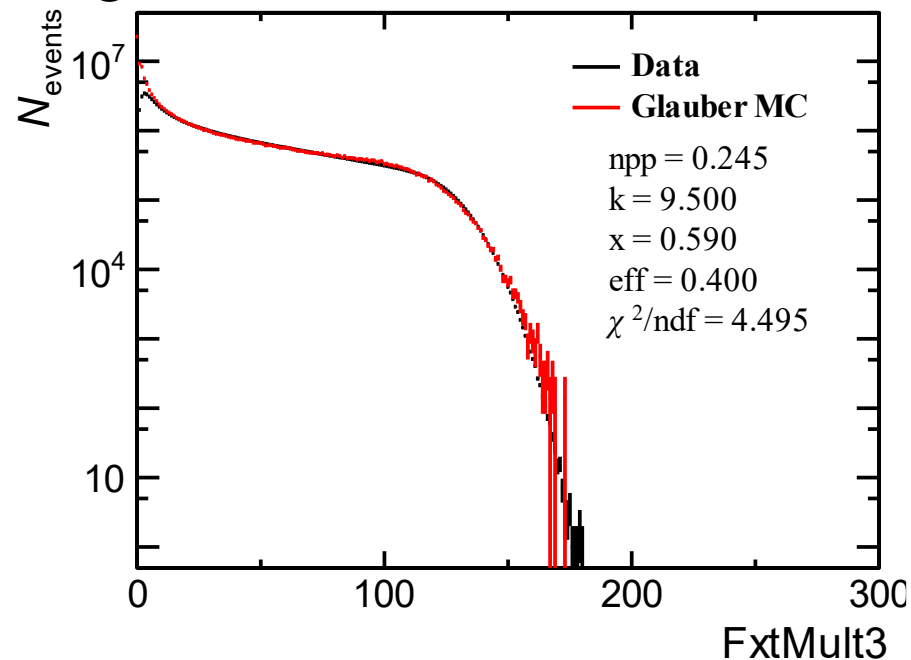
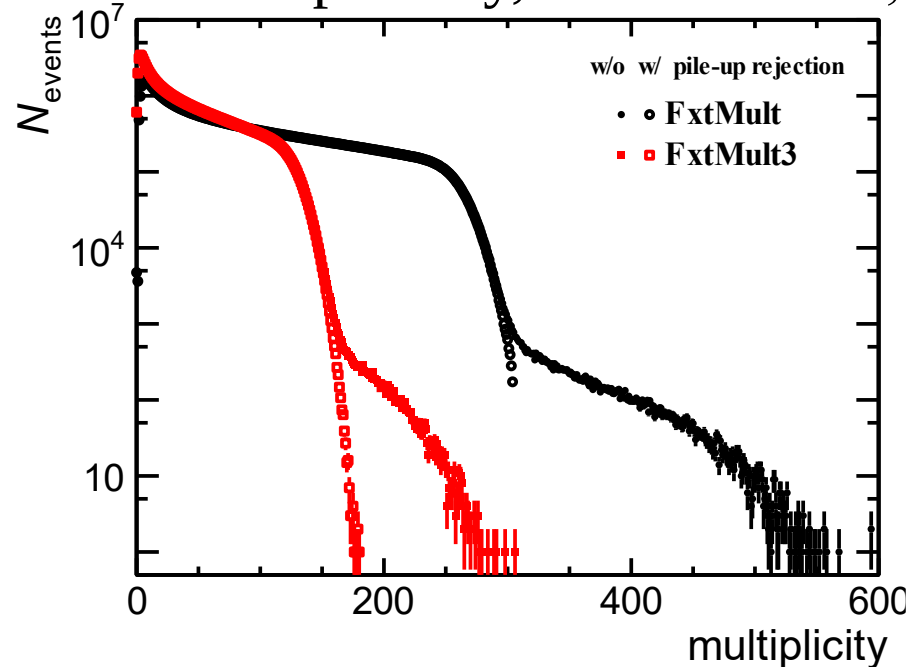


eTOF PID check (Δ cut)



Centrality determination

- FxtMult: primary
- FxtMult3: primary, $n\text{HitsFit} > 10$, $n\text{SigmaProton} - 2.15 < -3$



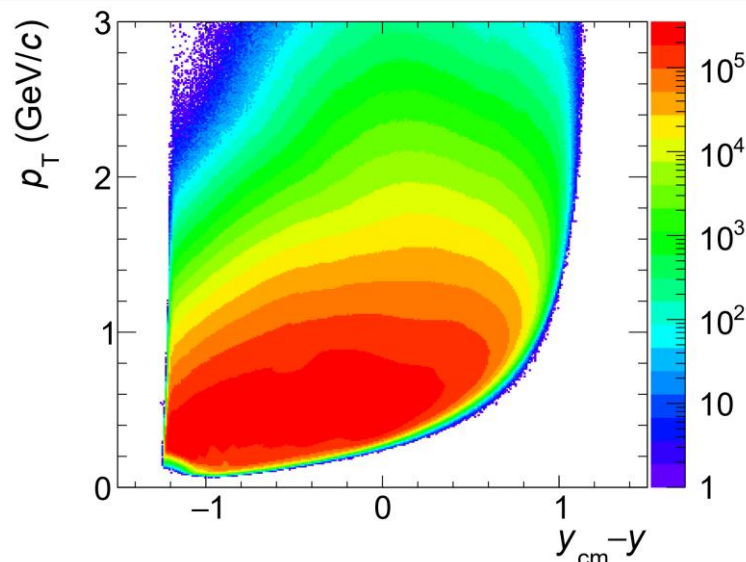
10^6 Glauber events
 $\sigma_{\text{nn}} = 29 \text{ mb}$

Fit @ FxtMult3 > 25

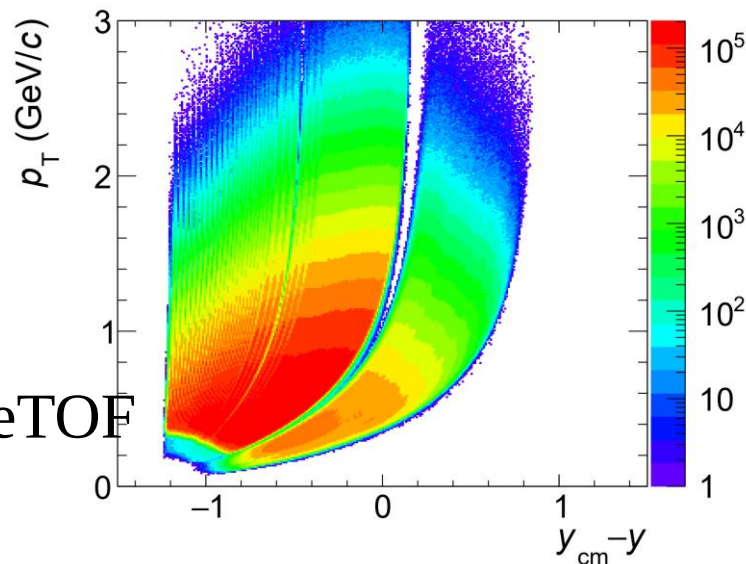
FxtMult3 >	1	2	3	4	6	8	11	15
Centrality	75-80%	70-75%	65-70%	60-65%	55-60%	50-55%	45-50%	40-45%
FxtMult3 >	21	27	34	43	54	67	82	101
Centrality	35-40%	30-35%	25-30%	20-25%	15-20%	10-15%	5-10%	0-5%

Acceptance

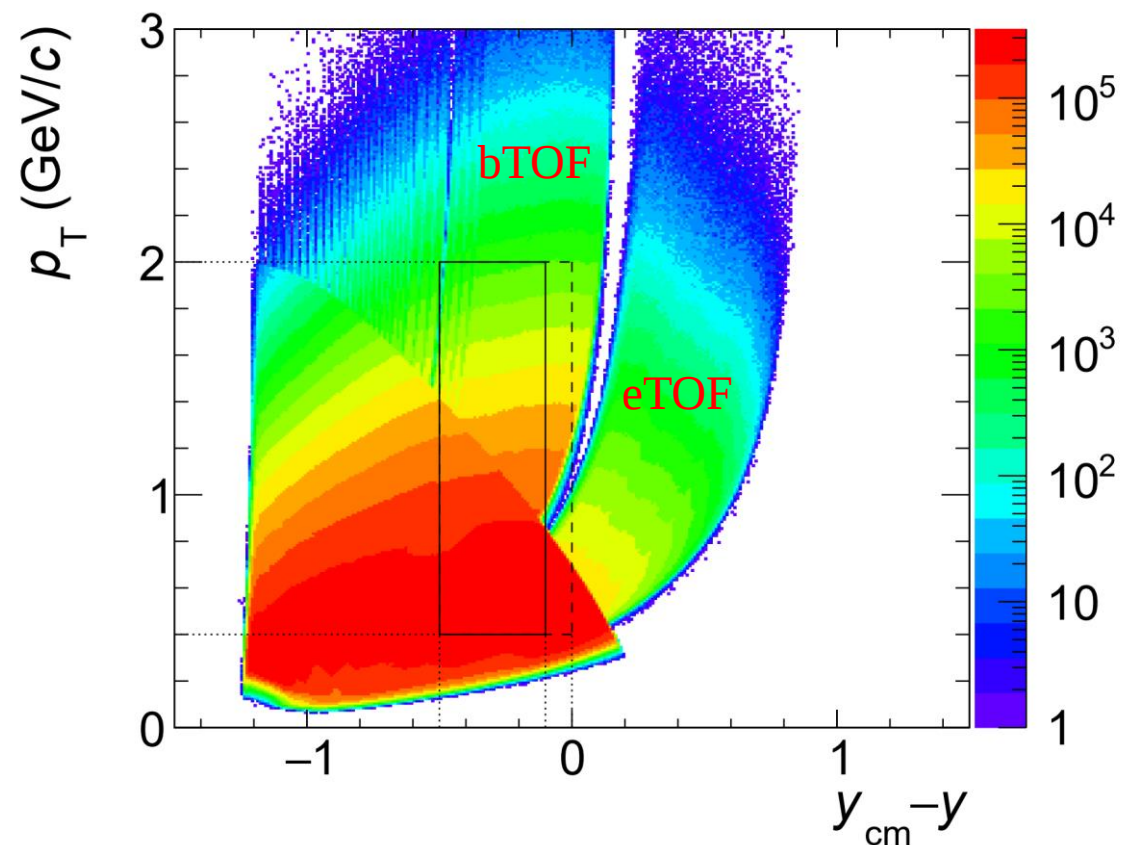
- Only TPC
- $y_{\text{cm}} = -1.250$



- TPC+bTOF/eTOF



- Only TPC, $p < 2$ GeV/c
- TPC+bTOF/eTOF, $p > 2$ GeV/c



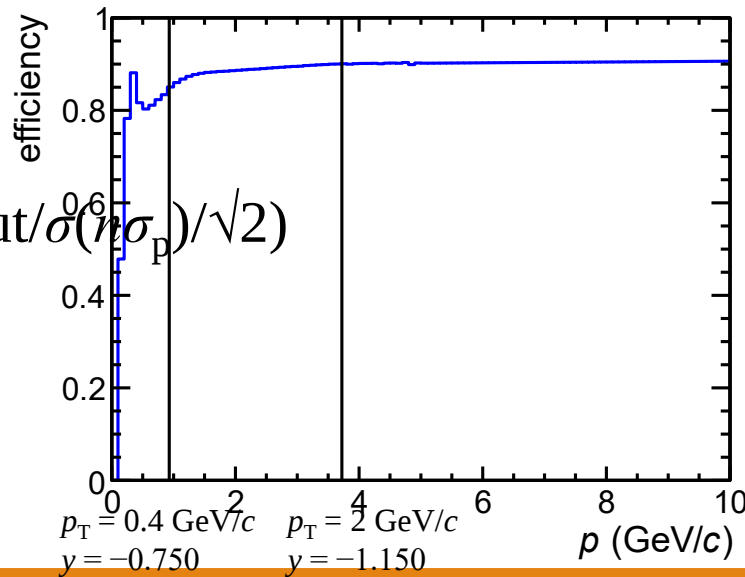
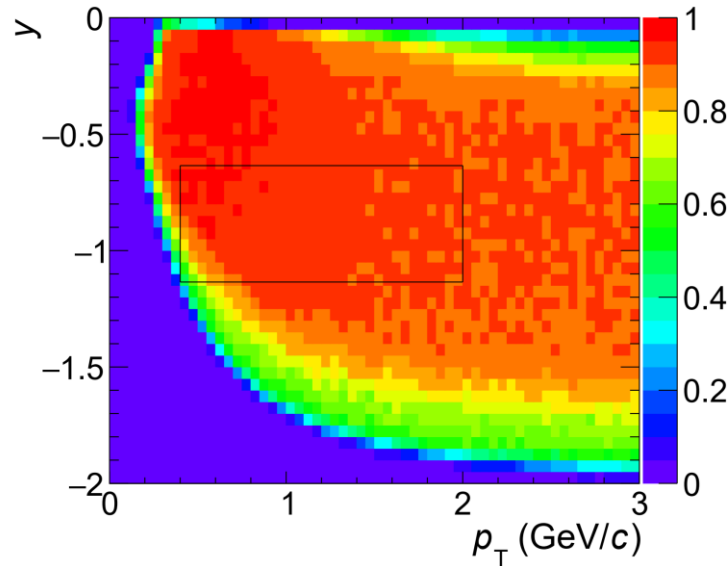
Efficiency

- TPC

- Tracking
@ 3.0 GeV

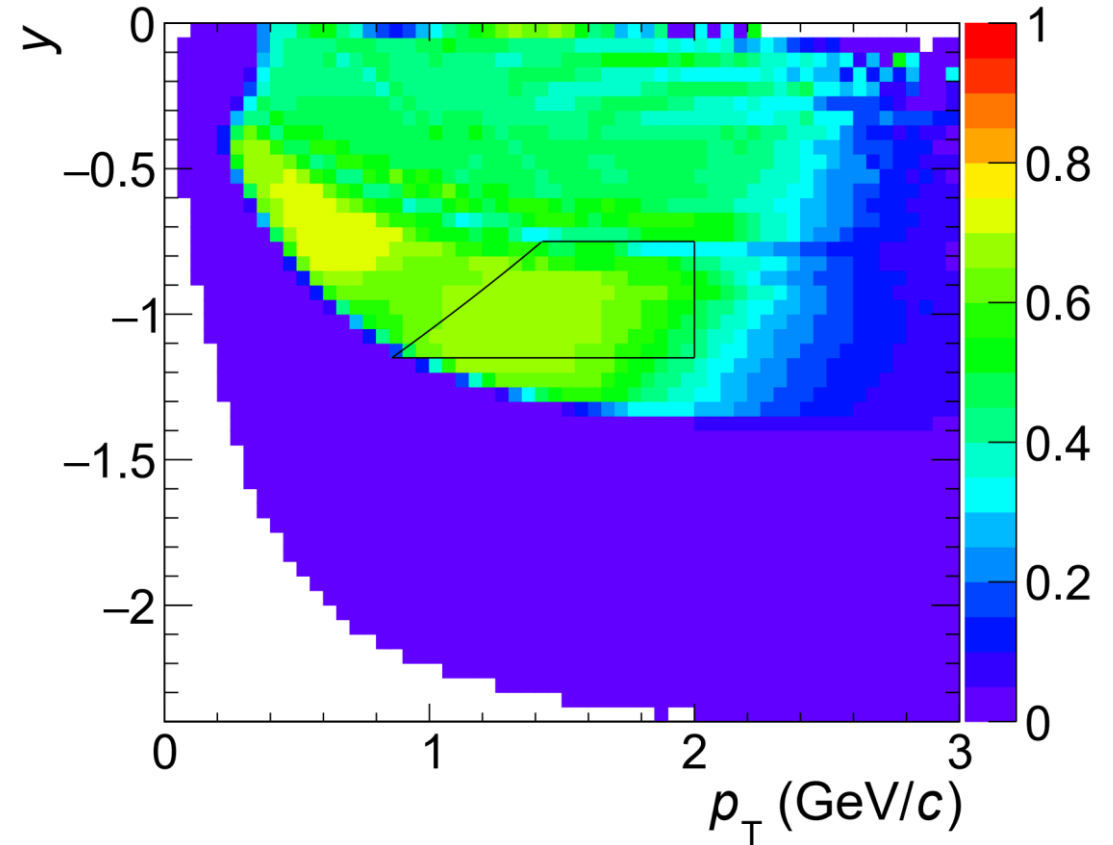
- PID

- $\varepsilon = \text{erf}(n\sigma_p \text{ cut}/\sigma(n\sigma_p)/\sqrt{2})$



- bTOF

- $\varepsilon = N(\text{TPC+bTOF PID})/N(\text{TPC PID})$

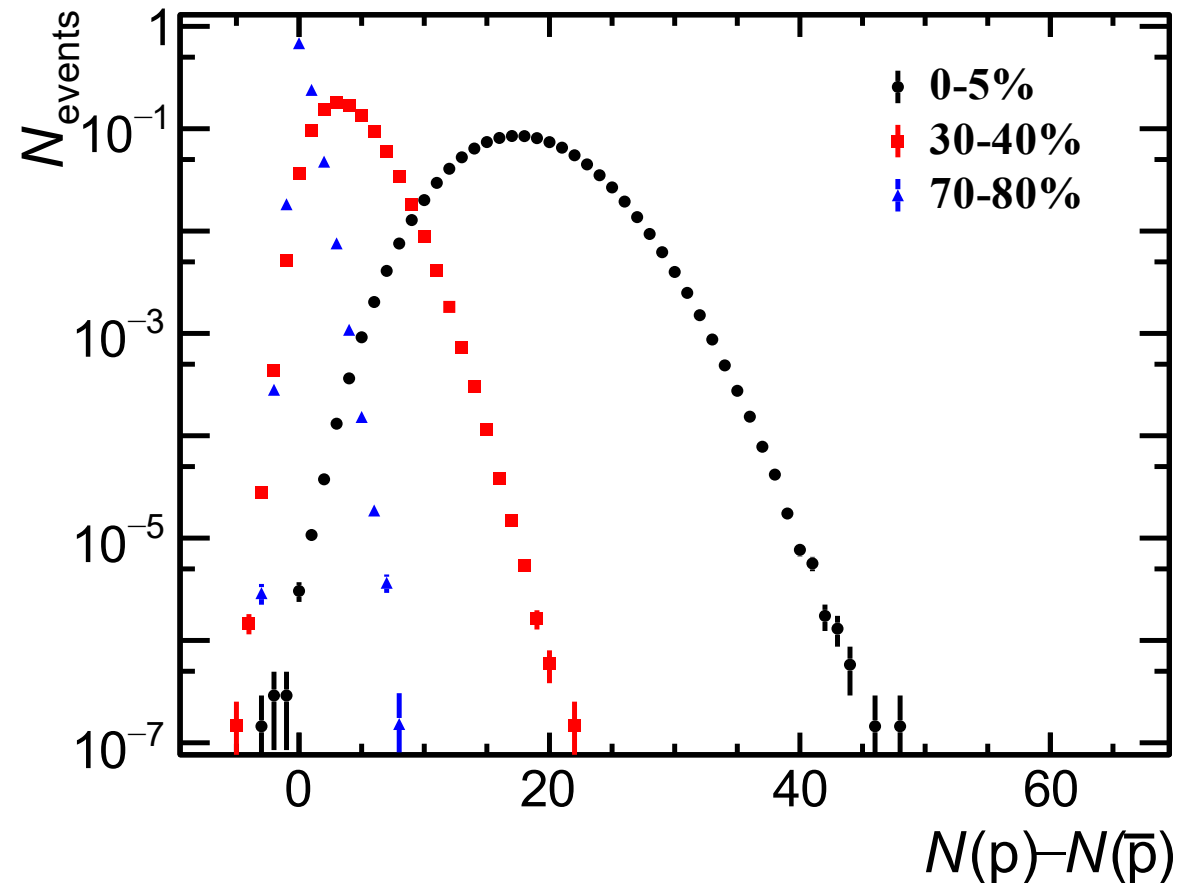


Analysis cuts

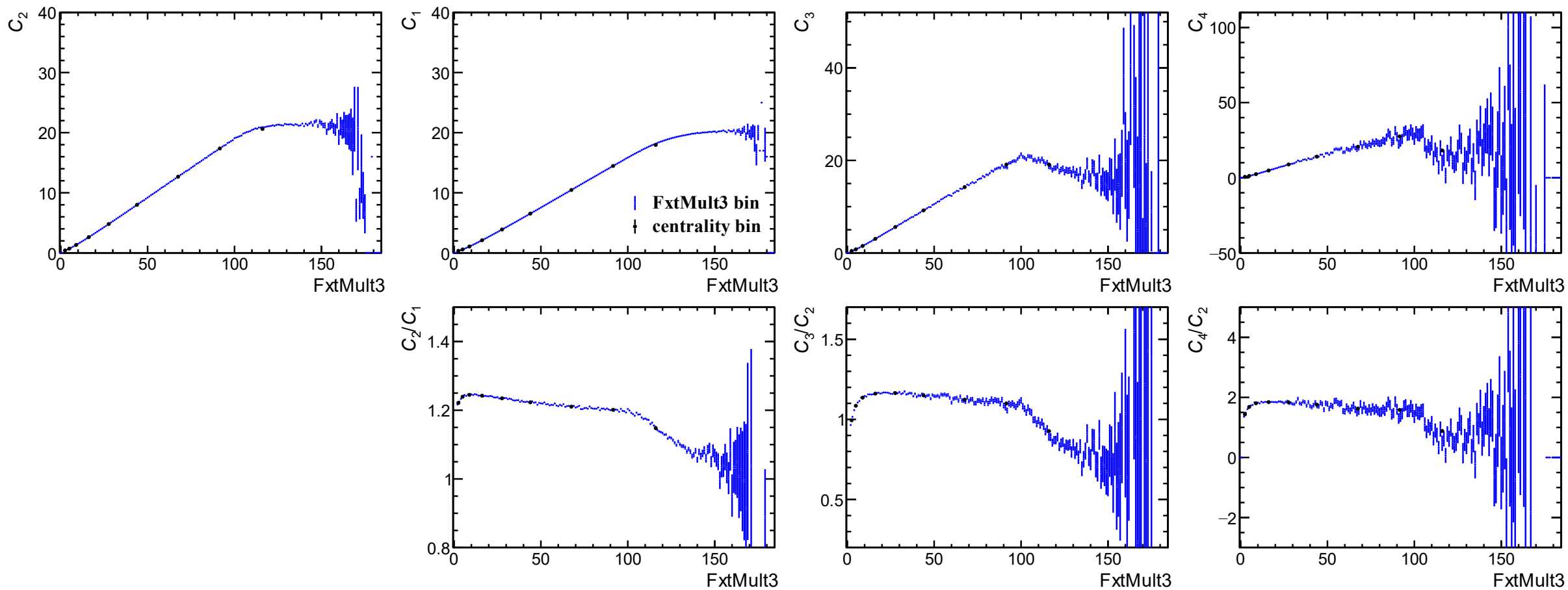
- Trigger ID
 - 720007 (epde-or-bbce-or-vpde-tof1-etof)
- Run cuts
 - Bad run rejection
- Event cuts:
 - $198 \text{ cm} < V_z < 202 \text{ cm}$
 - $|V_r| < 2 \text{ cm}$, with center $(0, -2) \text{ cm}$
 - Pile-up event rejection
- Events: 0.98×10^8
- Track cuts
 - Primary
 - $|gDca| < 3 \text{ cm}$
 - $n\text{HitsFit} > 10$
 - $n\text{HitsFit}/n\text{HitsPoss} > 0.52$
 - $n\text{HitsDedx} > 5$
 - $0.4 \text{ GeV}/c < p_T < 2 \text{ GeV}/c$
 - $-0.5 < y_{\text{cm}} - y < -0.1, y_{\text{cm}} = -1.250$
 - $|n\sigma_{\text{proton}} - \langle n\sigma_{\text{proton}} \rangle(p)| < 2$
 - $0.6 \text{ GeV}^2/c^4 < m^2 < 1.2 \text{ GeV}^2/c^4$
 - $p > 2 \text{ GeV}/c$

Measured distributions

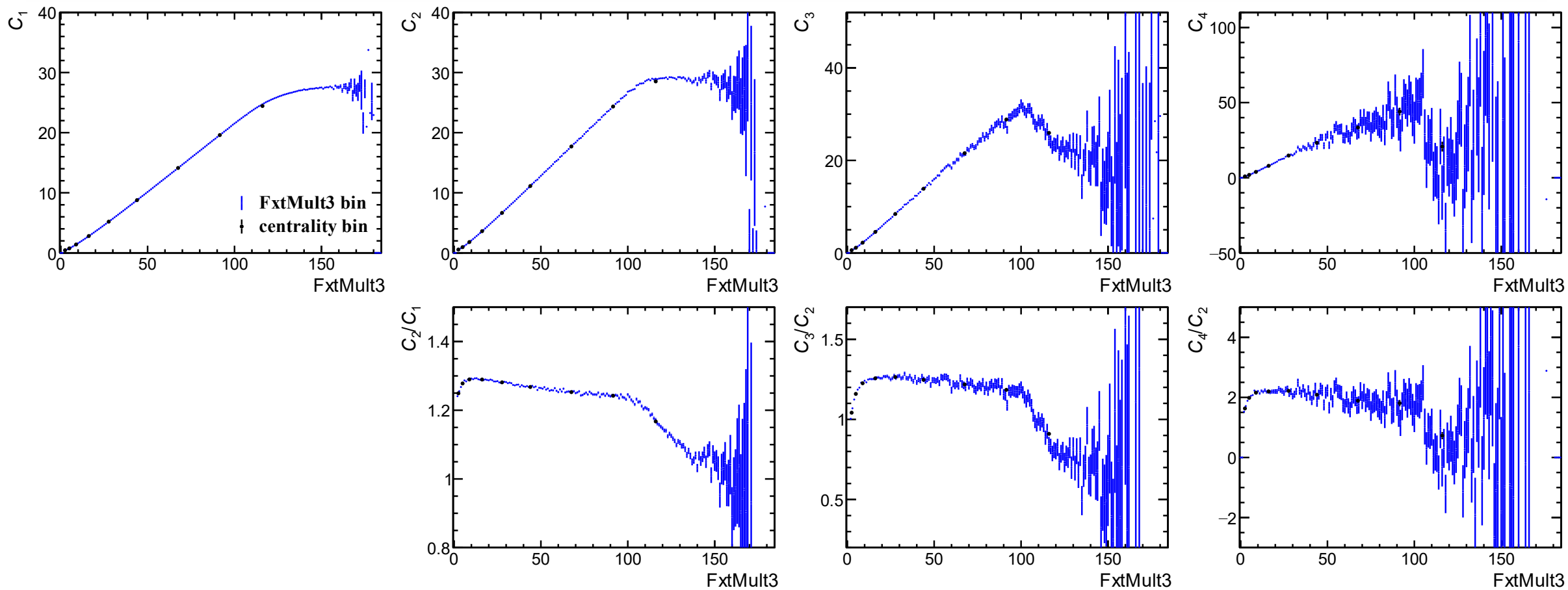
- Efficiency-uncorrected
- Centrality-dependent means and widths observed



Efficiency-uncorrected cumulants

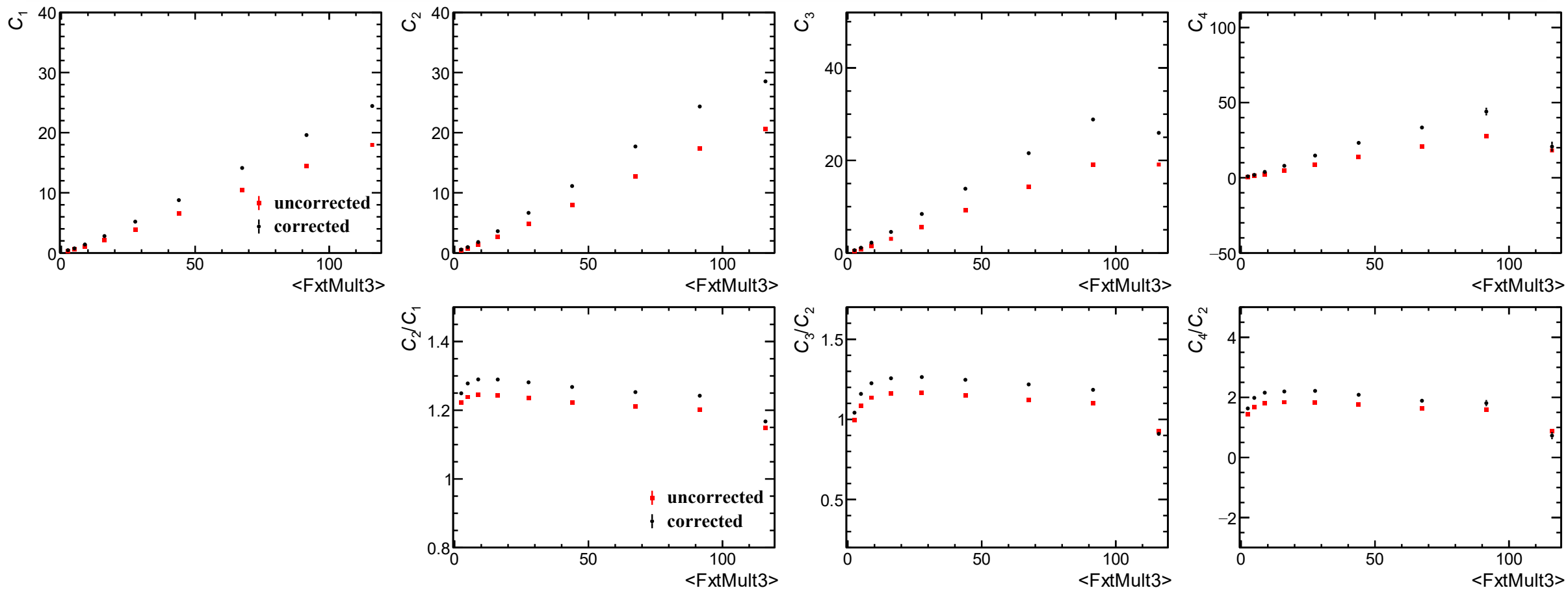


Efficiency-corrected cumulants

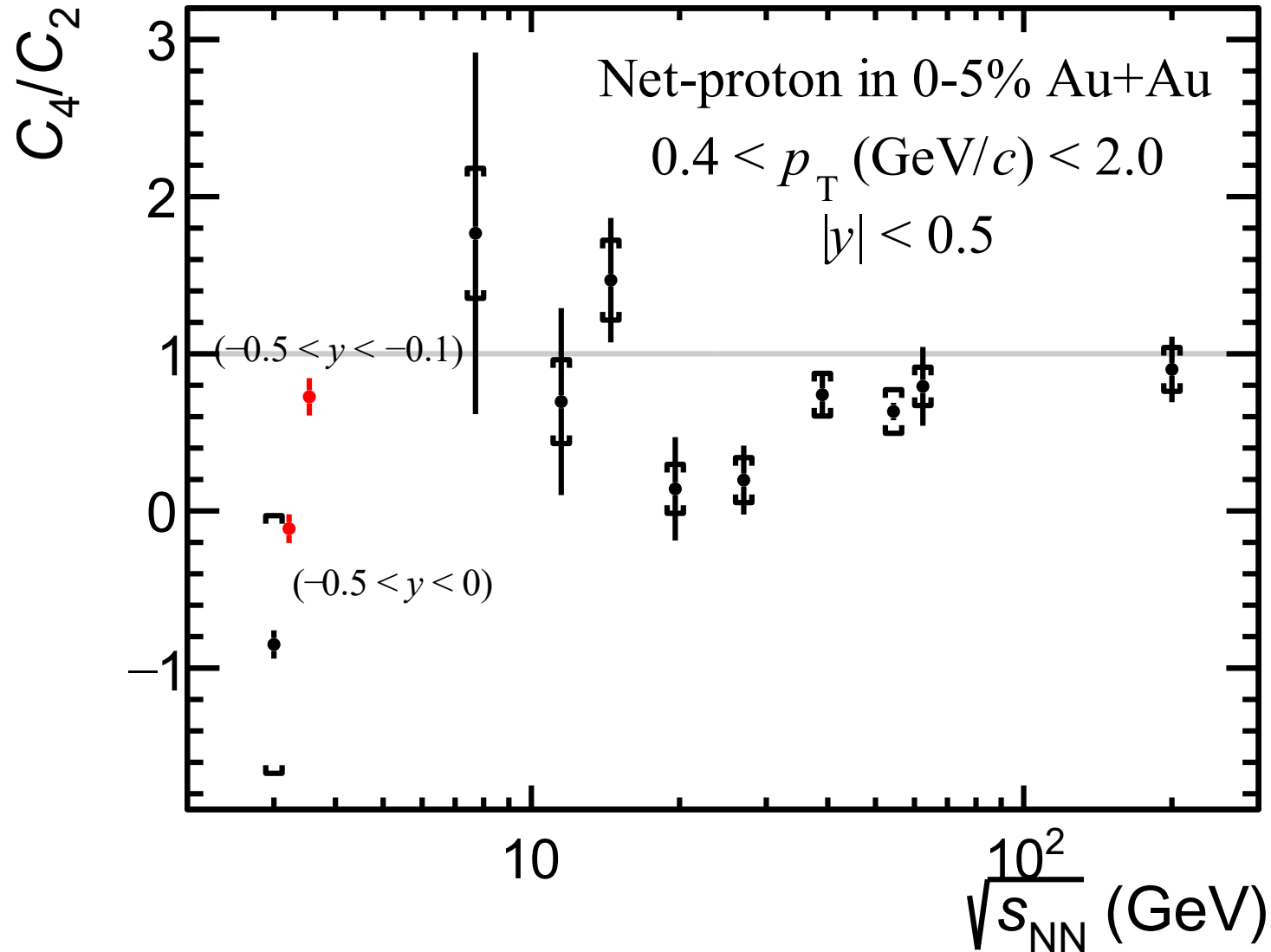


- Corrected with TPC tracking efficiency (@ 3.0 GeV), TPC PID efficiency and TOF efficiency

Comparison between (un)corrected results



Energy dependence



Summary & outlook

- Summary
 - Bad run and pile-up event rejection
 - TPC, bTOF & eTOF PID checks and $\langle n\sigma_p \rangle$ shift as a function of p
 - Centrality definition with FxtMult3 (w/ constant $\langle n\sigma_p \rangle$ shift)
 - TPC PID efficiency and bTOF efficiency
 - Efficiency-uncorrected and -corrected cumulants
- Outlook
 - eTOF calibration?
 - TPC tracking efficiency from embedding
 - Systematic uncertainty
 - Acceptance dependence

STAR environment on the ui server

STAR environment on SDCC

- ROOT version: 5.34/38, root & root4star (additional libraries loaded by default)
- STAR version: `$STAR_VERSION==SL21c` (for example)
 - Changed by: `$ starver STAR_VERSION`
- STAR path: `$STAR==/afs/rhic.bnl.gov/star/packages/$STAR_VERSION/`
- STAR executable files: `$STAR/mgr/` (cons, RootCint.pl, root4star, ...)
- STAR codes: `$STAR/StRoot/` (StMuDSTMaker, StPicoEvent, ...)
- STAR *.h: `$STAR/.sl73_x8664_gcc485/include/` (`$USE_64BITS==1`, or `.sl73_gcc485`)
- STAR *.so: `$STAR/.sl73_x8664_gcc485/lib/`
- STAR compiled codes: `$STAR/.sl73_x8664_gcc485/obj/StRoot/`
- `$LD_LIBRARY_PATH==.sl73_x8664_gcc485/lib:$STAR/.sl73_x8664_gcc485/lib:$ROOTSYS/lib:...`

STAR environment on SDCC

- Personal code files in `Personal_Path/StRoot/StMyClass/`, `MyCode.cxx` `MyCode.h`
- In `Personal_Path`, `$STAR/mgr/cons`
 - Creates directory `.sl73_x8664_gcc485/`
 - Creates directory `.sl73_x8664_gcc485/obj/StRoot/StMyClass/`, and in it
 - Creates soft links to code files in `StRoot/StMyClass/` (recursively enters subdirectories)
 - Compiles `*.cxx` to `*.o` (`g++ 4.8.5 -std=c++0x`)
 - Include paths: `.`, `StRoot`, `.sl73_x8664_gcc485/include`, directories in `StRoot/StMyClass`, `$STAR`, `$STAR/StRoot`, `$STAR/.sl73_x8664_gcc485/include`, directories in `$STAR/StRoot/StMyClass`, `$ROOTSYS/include`
 - Calls `$STAR/mgr/RootCint.pl` (1) to create `LinkDef.h` from `*.h`, (2) to call `$ROOTSYS/bin/rootcint` to create `StMyClass_Cint.[cxx,h]` from `*.h`
 - Compiles `StMyClass_Cint.cxx` to `StMyClass_Cint.o`
 - Creates `StMyClass.so` from `*.o`
 - Creates directory `.sl73_x8664_gcc485/lib/`, and in it
 - Creates soft links `(lib)StMyClass.so` to `.sl73_x8664_gcc485/obj/StRoot/StMyClass/StMyClass.so`

Installation

- Download STAR environment (version: SL21c) from SDCC
 - \$STAR/asps/
 - \$STAR/mgr/ (only RootCint.pl available and needed)
 - \$STAR/pams/
 - \$STAR/StarVMC/
 - \$STAR/StRoot/
 - \$STAR/.sl73_x8664_gcc485/include/ (contains soft links to files in above paths)
 - \$STAR/.sl73_x8664_gcc485/obj/pams/geometry/
 - \$STAR/.sl73_x8664_gcc485/obj/StDb/
 - \$STAR/.sl73_x8664_gcc485/obj/StRoot/
- On the ui server, “.sl73_x8664_gcc485” is replaced by “.\$STAR_VERSION”
- g++ version is the same (4.8.5) as SDCC

Installation

- Download and compile ROOT (w/ default c++ version of g++ 4.8.5)
 - `$ROOTSYS=/ustcfs/HICUser/fsi/STAR/root`
 - Set `$ROOTSYS/etc/system.rootrc`, `rootlogon.C` and `rootlogoff.C` according to SDCC

```
Unix.*.Root.DynamicPath:  .:$(LD_LIBRARY_PATH):
```

```
Unix.*.Root.MacroPath:    .:StRoot/macros:StRoot/macros/graphics:StRoot/macros/analysis:StRoot/macros/test:StRoot/macros/examples:StRoot/macros/html:StRoot/macros/qa:StRoot/macros/calib:StRoot/macros/mudst:$(STAR)/StRoot/macros:$(STAR)/StRoot/macros/graphics:$(STAR)/StRoot/macros/analysis:$(STAR)/StRoot/macros/test:$(STAR)/StRoot/macros/examples:$(STAR)/StRoot/macros/html:$(STAR)/StRoot/macros/qa:$(STAR)/StRoot/macros/calib:$(STAR)/StRoot/macros/mudst:$(ROOTSYS)/macros:$(ROOTSYS)/tutorials:
```

```
Unix.*.Root.IncludePath:  -I.$(STAR_VERSION)/include -I./StRoot -I$(STAR)/.$(STAR_VERSION)/include -I$(STAR)/StRoot -I$(ROOTSYS)/include
```

```
Unix.*.Root.LinkedLibs:   -L$(ROOTSYS)/lib
```

```
Unix.*.Root.PluginPath:   :plugins:$(HOME)/plugins:StRoot/macros/plugins:$(STAR)/StRoot/macros/plugins:$(ROOTSYS)/etc/plugins:
```

```
Rint.Load:                $(ROOTSYS)/tutorials/rootalias.C
```

```
Rint.Logon:                $(ROOTSYS)/etc/rootlogon.C
```

```
Rint.Logoff:               $(ROOTSYS)/etc/rootlogoff.C
```

```
gSystem->SetIncludePath("-I. -I.$(STAR_VERSION)/include -IStRoot -I$STAR -I$STAR/.$(STAR_VERSION)/include -I$STAR/StRoot -I/usr/include/mysql -I/usr/include/libxml2 -I/usr/include/Qt -I/usr/include/QtCore -I/usr/include/QtGui -I$ROOTSYS/include");
```

```
gSystem->Load("libxml2");
gSystem->Load("libThread");
gSystem->Load("libRIO");
gSystem->Load("libMatrix");
gSystem->Load("libHist");
gSystem->Load("libGraf");
gSystem->Load("libGpad");
gSystem->Load("libGraf3d");
gSystem->Load("libNet");
gSystem->Load("libTree");
gSystem->Load("libTable");
gSystem->Load("libGeom");
gSystem->Load("libPhysics");
gSystem->Load("libPostscript");
gSystem->Load("libEG");
gSystem->Load("libRootAuth");
```

Installation

- Write a simple but difficult “cons” to compile codes in StRoot/ and \$STAR/StRoot/
 - /ustcfs/HICUser/fsi/STAR/cons.sh (w/ c++0x)
 - Current compiled StClass: StarClassLibrary, StarRoot, St_base, StBichsel, StBTofUtil, StChain, StDbLib, St_db_Maker, StDetectorDbMaker, StEmcUtil, StEpdUtil, StETofUtil, StEvent, StEventUtilities, StIOMaker, StMagF, StMtdHitMaker, StMtdMatchMaker, StMtdUtil, StMuDSTMaker, StMyPicoDstMaker, StPicoDstMaker, StPicoEvent, StPmdUtil, StPreEclMaker, StRefMultCorr, StStrangeMuDstMaker, StTableUtilities, StTofUtil, StTreeMaker, StTriggerDataMaker, StUtilities
- Write another “cons” to compile codes in \$STAR/.\$STAR_VERSION/obj/StDb/ & \$STAR/.\$STAR_VERSION/obj/pams/geometry/
 - *LinkDef.h downloaded from SDCC (created by RootCint.pl are different)
 - Creates libStDb_Tables.so & libgeometry_Tables.so and soft links in \$STAR/.\$STAR_VERSION/lib
- Write a simple “starver” to set/change STAR_VERSION and other variables
 - /ustcfs/HICUser/fsi/STAR/starver.sh

Usage

- `$ source /ustcfs/HICUser/fsi/STAR/starver.sh [ STAR_VERSION ]`
- Or `$ . /ustcfs/HICUser/fsi/STAR/starver.sh [ STAR_VERSION ]`
- Or `$ . starver.sh [ STAR_VERSION ]` (if `$PATH` contains the path)
 - Default: SL21c (only supported now)
 - Environment variables
 - `STAR_VERSION=SL21c`
 - `STAR=/ustcfs/HICUser/fsi/STAR/$STAR_VERSION`
 - `PATH=/ustcfs/HICUser/fsi/STAR:$STAR/mgr:/ustcfs/HICUser/fsi/STAR/root/bin:$PATH`
 - `LD_LIBRARY_PATH=.$STAR_VERSION/lib:$STAR/.$STAR_VERSION/lib:/ustcfs/HICUser/fsi/STAR/root/lib:$LD_LIBRARY_PATH`
 - `ROOTSYS=/ustcfs/HICUser/fsi/STAR/root`, and other ROOT variables
- Change `$STAR_VERSION` by calling “starver.sh” again

Usage

- `$ cd Directory_Containing_StRoot`
- `$ rm -r .$STAR_VERSION` (if previous compilation exists)
- `$ cons.sh`
- `$ root -l -b`
- `*** Start at Date : Mon Apr 11 00:00:00 2022`
- `QAInfo:You are using STAR_VERSION : SL21c, ROOT_VERSION : 5.34/38 and node : ui03.hep.ustc.edu.cn`
- `root [0] gSystem->Load("Required_Libraries");`
- `root [1] Run_Your_Code;`
- `root [2] .q`

- This is the end of ROOT -- Goodbye

Downloaded STAR data

- Data set: Au+Au @ 19.6 GeV BES-II
- Trigger setup: production_19GeV_2019
- Stream: st_physics(_adc)
- Production: P21ic
- Library: SL21c
- Size: 11 TB
- # files: 15412 (103971 total)
- Path: /ustcfs/HICUser/fsi/STARDATA/production_19GeV_2019/

Example

- `$ rsync -a /ustcfs/HICUser/fsi/STAR/test ./`
- `$ cd test`
- `$ source /ustcfs/HICUser/fsi/STAR/starver.sh SL21c`
- `$ cons.sh`
- `$ root -l -b -q -x readPicoDst.C`

- Maybe slow to open ROOT and load libraries for the first time

Example

```
[fsi@ui03]~$ cd STAR/test/
[fsi@ui03]~/STAR/test$ source /ustcfs/HICUser/fsi/STAR/starver.sh SL21c
[fsi@ui03]~/STAR/test$ cons.sh
STAR_VERSION: SL21c
STAR: /ustcfs/HICUser/fsi/STAR/SL21c
ROOT_VERSION: 5.34/38
ROOTSYS: /ustcfs/HICUser/fsi/STAR/root
CXX = g++
CXXFLAGS = -m64 -fPIC -pipe -Wall -Woverloaded-virtual -std=c++0x -Wno-long-long -pthread
PPFLAGS = -DSL21c -D__ROOT__ -DNEW_DAO_READER
DEBUG = -g
CXXSHAREDFLAGS = -m64 -shared -Wl,-Bdynamic
Run in StRoot/StMyMaker
g++ -m64 -fPIC -pipe -Wall -Woverloaded-virtual -std=c++0x -Wno-long-long -pthread -g -DSL21c -D__ROOT__ -DNEW_DAO_READER -I. -IStRoot -I.SL21c/include -I.SL21c/obj/StRoot/StMyMaker -IStRoot/RTS/src -IStRoot/RTS/include -IStRoot/RTS/trg/
include -I/ustcfs/HICUser/fsi/STAR/SL21c -I/ustcfs/HICUser/fsi/STAR/SL21c/StRoot -I/ustcfs/HICUser/fsi/STAR/SL21c/.SL21c/include -I/ustcfs/HICUser/fsi/STAR/SL21c/StRoot/RTS/src -I/ustcfs/HICUser/fsi/STAR/SL21c/StRoot/RTS/include -I/ustcf
s/HICUser/fsi/STAR/SL21c/StRoot/RTS/trg/include -I/ustcfs/HICUser/fsi/STAR/root/include -I/usr/include/mysql -I/usr/include/libxml2 -I/usr/include/Qt -I/usr/include/QtCore -I/usr/include/QtGui -c .SL21c/obj/StRoot/StMyMaker/StMyMaker.cxx
-o .SL21c/obj/StRoot/StMyMaker/StMyMaker.o
RootCint.pl ".SL21c/obj/StRoot/StMyMaker/StMyMaker.Cint.cxx" ".SL21c/obj/StRoot/StMyMaker/StMyMaker.h .SL21c/obj/StRoot/StMyMaker/StMyCuts.h" "-I. -IStRoot -I.SL21c/include -I.SL21c/obj/StRoot/StMyMaker -IStRoot/RTS/src -IStRoot/RTS/incl
ude -IStRoot/RTS/trg/include -I/ustcfs/HICUser/fsi/STAR/SL21c -I/ustcfs/HICUser/fsi/STAR/SL21c/StRoot -I/ustcfs/HICUser/fsi/STAR/SL21c/.SL21c/include -I/ustcfs/HICUser/fsi/STAR/SL21c/StRoot/RTS/src -I/ustcfs/HICUser/fsi/STAR/SL21c/StRoot
/RTS/include -I/ustcfs/HICUser/fsi/STAR/SL21c/StRoot/RTS/trg/include -I/ustcfs/HICUser/fsi/STAR/root/include -I/usr/include/mysql -I/usr/include/libxml2 -I/usr/include/Qt -I/usr/include/QtCore -I/usr/include/QtGui"
#pragma link C++ class StMyMaker+;
cmd (normal)= rootcint -f .SL21c/obj/StRoot/StMyMaker/StMyMaker.Cint.cxx -c -DROOT_CINT -D__ROOT__ -I.SL21c/obj/StRoot/StMyMaker -I. -IStRoot -I.SL21c/include -I.SL21c/obj/StRoot/StMyMaker -IStRoot/RTS/src -IStRoot/RTS/include -IStRoot/
RTS/trg/include -I/ustcfs/HICUser/fsi/STAR/SL21c -I/ustcfs/HICUser/fsi/STAR/SL21c/StRoot -I/ustcfs/HICUser/fsi/STAR/SL21c/.SL21c/include -I/ustcfs/HICUser/fsi/STAR/SL21c/StRoot/RTS/src -I/ustcfs/HICUser/fsi/STAR/SL21c/StRoot/RTS/include
-I/ustcfs/HICUser/fsi/STAR/SL21c/StRoot/RTS/trg/include -I/ustcfs/HICUser/fsi/STAR/root/include -I/usr/include/mysql -I/usr/include/libxml2 -I/usr/include/Qt -I/usr/include/QtCore -I/usr/include/QtGui StMyMaker.h LinkDef.h
g++ -m64 -fPIC -pipe -Wall -Woverloaded-virtual -std=c++0x -Wno-long-long -pthread -g -DSL21c -D__ROOT__ -DNEW_DAO_READER -I. -IStRoot -I.SL21c/include -I.SL21c/obj/StRoot/StMyMaker -IStRoot/RTS/src -IStRoot/RTS/include -IStRoot/RTS/trg/
include -I/ustcfs/HICUser/fsi/STAR/SL21c -I/ustcfs/HICUser/fsi/STAR/SL21c/StRoot -I/ustcfs/HICUser/fsi/STAR/SL21c/.SL21c/include -I/ustcfs/HICUser/fsi/STAR/SL21c/StRoot/RTS/src -I/ustcfs/HICUser/fsi/STAR/SL21c/StRoot/RTS/include -I/ustcf
s/HICUser/fsi/STAR/SL21c/StRoot/RTS/trg/include -I/ustcfs/HICUser/fsi/STAR/root/include -I/usr/include/mysql -I/usr/include/libxml2 -I/usr/include/Qt -I/usr/include/QtCore -I/usr/include/QtGui -c .SL21c/obj/StRoot/StMyMaker/StMyMaker_Cin
t.cxx -o .SL21c/obj/StRoot/StMyMaker/StMyMaker.Cint.o
g++ -g -m64 -shared -Wl,-Bdynamic -o .SL21c/obj/StRoot/StMyMaker/StMyMaker.so .SL21c/obj/StRoot/StMyMaker/StMyMaker.Cint.o .SL21c/obj/StRoot/StMyMaker/StMyMaker.o
Install ../obj/StRoot/StMyMaker/StMyMaker.so as .SL21c/lib/StMyMaker.so
Install ../obj/StRoot/StMyMaker/StMyMaker.so as .SL21c/lib/libStMyMaker.so
[fsi@ui03]~/STAR/test$ root -l -b -q -x readPicoDst.C
*** Start at Date : Mon Apr 11 00:23:52 2022
QAInfo:You are using STAR_VERSION : SL21c, ROOT_VERSION : 5.34/38 and node : ui03.hep.ustc.edu.cn
root [0]
Processing readPicoDst.C...
strangeArrayNames=arrayNames-_NARRAYS_ = 0
StInfo: Read in picoDst file /ustcfs/HICUser/fsi/STARDATA/production_19GeV_2019/st_physics_adc_20092060_raw_3000003.picoDst.root
StInfo: Total 1 files have been read in.
Initializing histograms.
1407 events in chain, 1407 will be read.
Working on eventNumber 0
StQAInfo: =====
StQAInfo: QAInfo:Chain StChain:bfcChain Ast = 6.72 Cpu = 3.17
StQAInfo: QAInfo:Maker StMyMaker::myMaker Ast = 0.44( 6.5%) Cpu = 0.43(13.6%)
StQAInfo: QAInfo:Maker StPicoDstMaker::picoDstMaker Ast = 6.28(93.5%) Cpu = 2.74(86.4%)
Writing histograms.
StInfo: -----Error Codes-----
StInfo: nStOK nStWarn nStEOF nStErr nStPatal
StInfo: 2814 0 0 0 0
StInfo: -----
StInfo: StMemStat::Summary(calls) Min Aver Max RMS
=====
Real time 0:00:35, CP time 4.590
This is the end of ROOT -- Goodbye
[fsi@ui03]~/STAR/test$
```

Plans

- Download new data
 - production_5p75GeV_fixedTarget_2020, production_7p3GeV_fixedTarget_2020, production_9p8GeV_fixedTarget_2020, production_13p5GeV_fixedTarget_2020, production_19p5GeV_fixedTarget_2020, production_31p2GeV_fixedTarget_2020
- Download and install new STAR versions
- Compile ROOT with c++11?
 - Also change default c++ version used by “cons.sh” to c++11