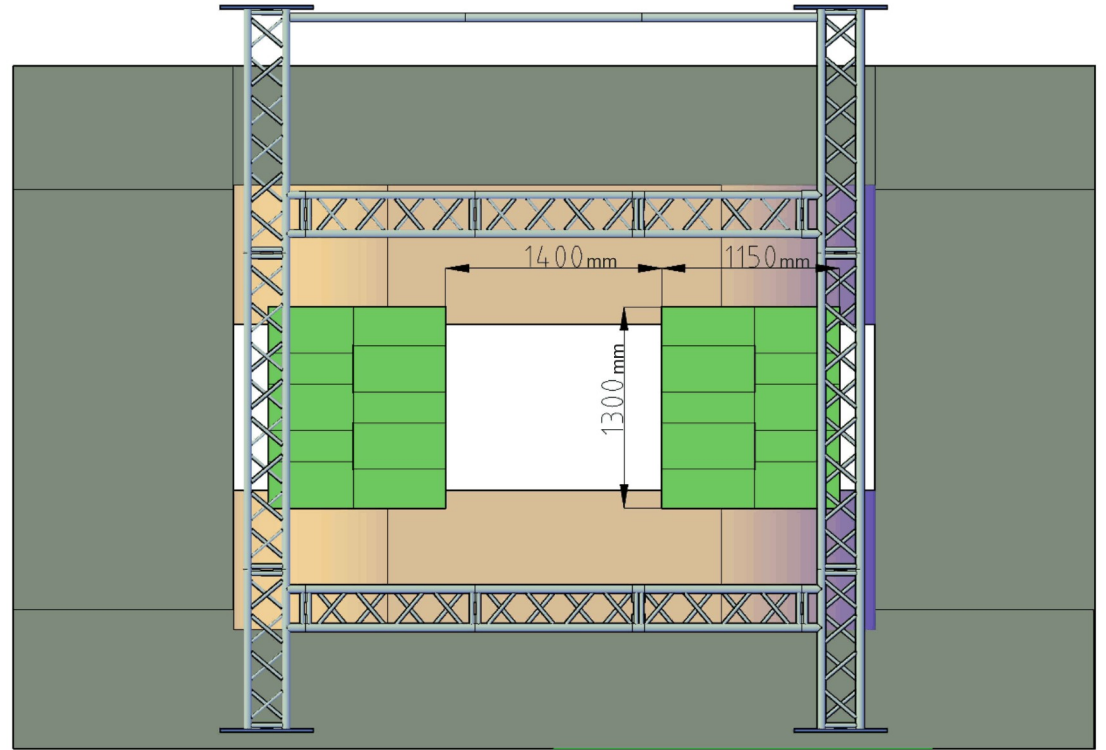
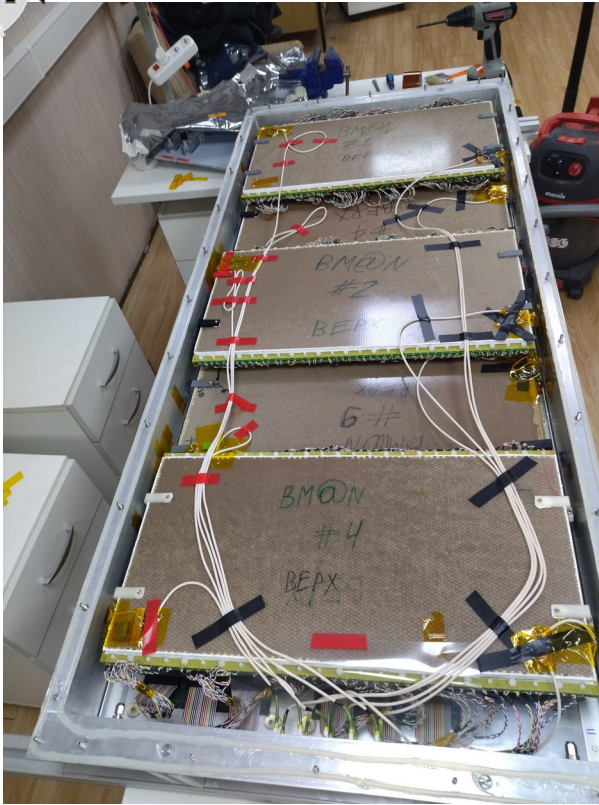
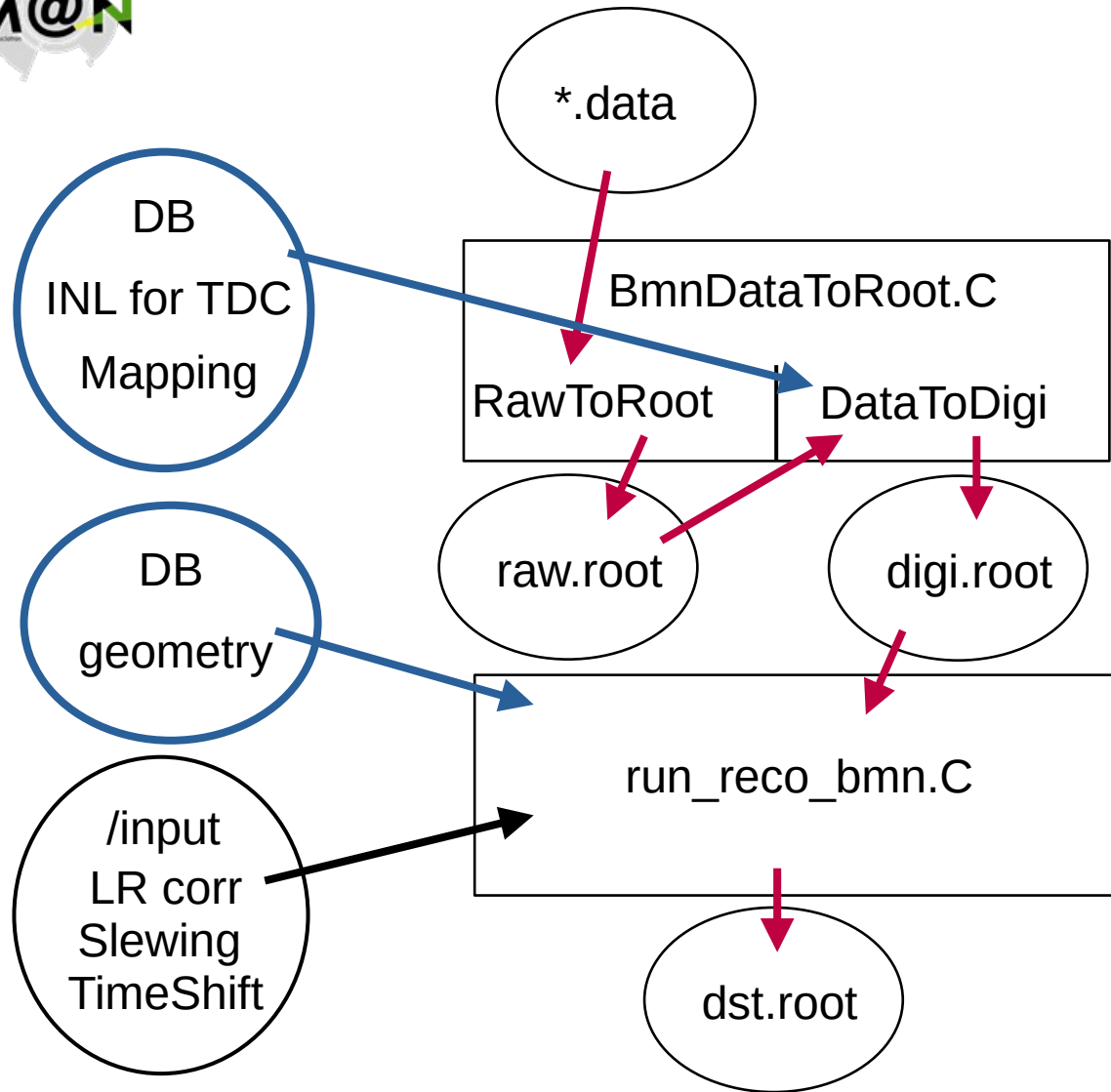


Data processing status of the TOF400 detector

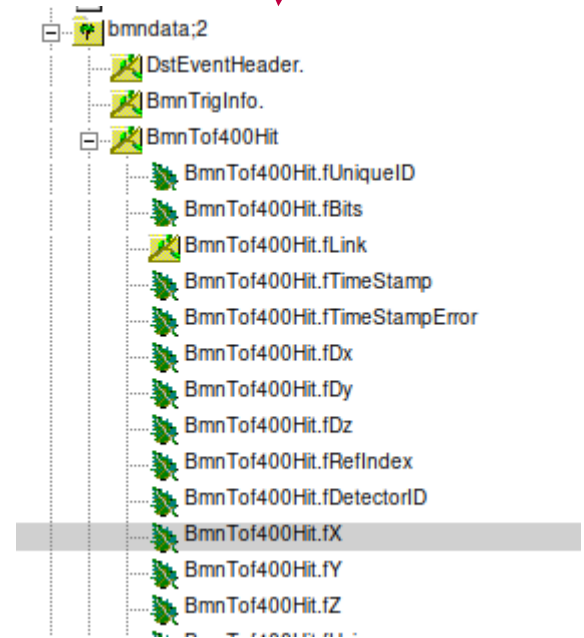


- mRPC detector with active area 30*60 cm².
- 48 readout strips of 1*30 cm² in one mRPC.
- 90% C₂H₂F₄ + 5% SF₆ + 5% i-C₄H₁₀
- 11,5 kV working point
- Two arms of 10 mRPC detectors each.
- Active area 2*1,1*1,3 m²
- 960 Readout strips.
- 1920 channel of FEE.

Data processing flow for TOF400.



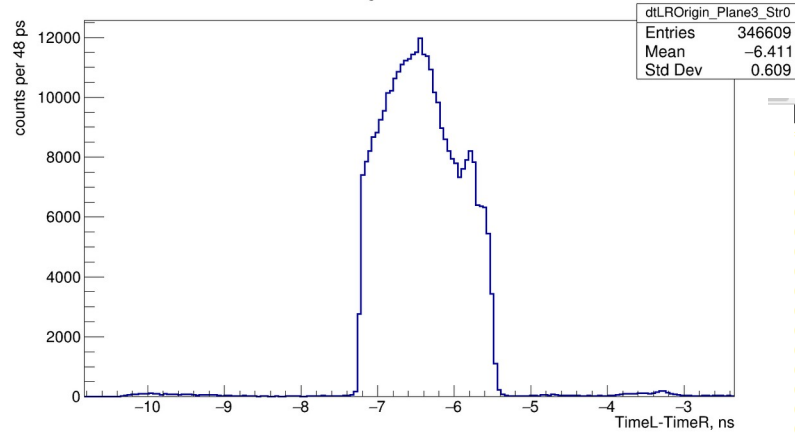
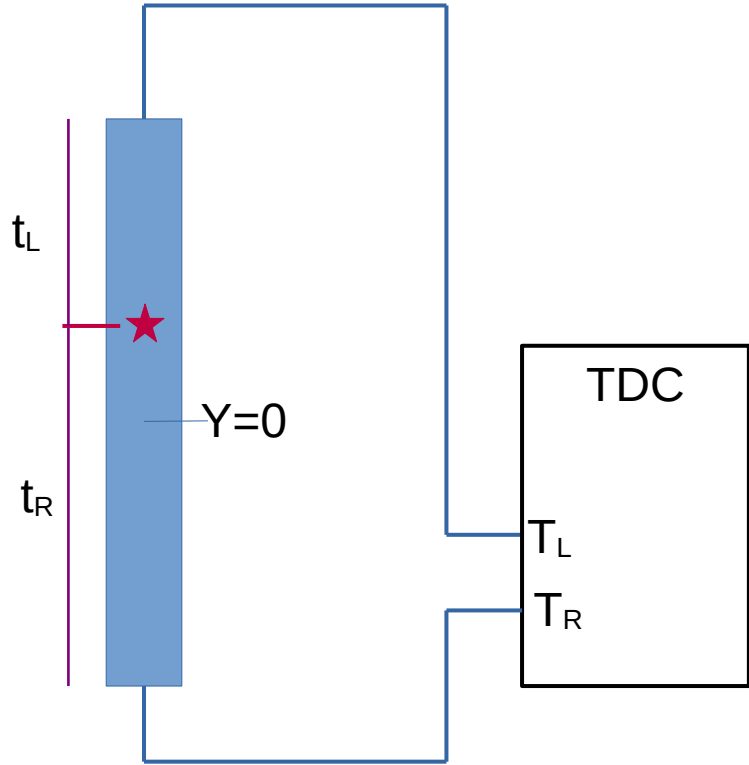
74	61	72	20	00	00	00	52	75	6E	23	04	00	00	00	2F	00	00	00	
49	6E	64	78	0C	00	00	00	6D	70	64	2D	76	6D	65	64	61	71	2D	32
62	4A	62	4A	DC	00	00	00	00	00	00	00	11	2E	69	01	D4	00	00	D1
00	00	00	A0	00	00	12	85	40	20	00	E1	01	00	0F	95	00	00	0A	87
00	00	08	50	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
00	00	00	00	00	00	00	00	00	00	00	10	00	00	00	10	00	00	00	10
00	00	00	10	00	00	00	10	00	00	00	10	00	00	00	10	00	00	00	10
00	00	00	10	00	00	00	10	00	00	00	10	00	00	00	10	00	00	00	10
00	00	00	10	00	00	00	10	00	00	00	10	30	1A	00	E1	22	00	0F	97
00	00	CC	87	90	1E	00	E1	01	00	8F	97	00	00	92	88	A0	22	00	E1
01	00	8F	98	00	00	92	89	60	22	00	E1	01	00	8F	99	00	00	92	8A



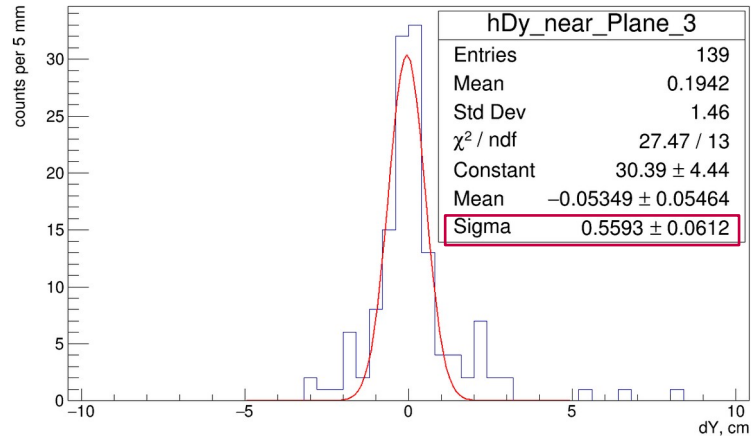
```

    bmndata;2
    ├── DstEventHeader.
    ├── BmnTrigInfo.
    └── BmnTof400Hit
        ├── BmnTof400Hit.fUniqueID
        ├── BmnTof400Hit.fBits
        ├── BmnTof400Hit.fLink
        ├── BmnTof400Hit.fTimeStamp
        ├── BmnTof400Hit.fTimeStampError
        ├── BmnTof400Hit.fDx
        ├── BmnTof400Hit.fDy
        ├── BmnTof400Hit.fDz
        ├── BmnTof400Hit.fRefIndex
        ├── BmnTof400Hit.fDetectorID
        └── BmnTof400Hit.fX
    
```

Calibration of cable length (LR correction).

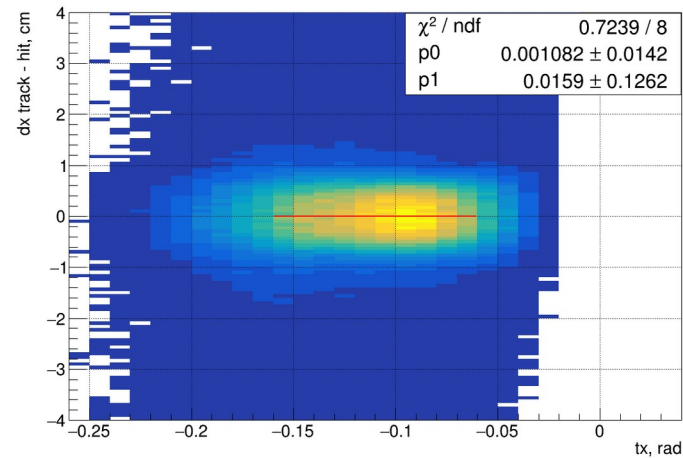
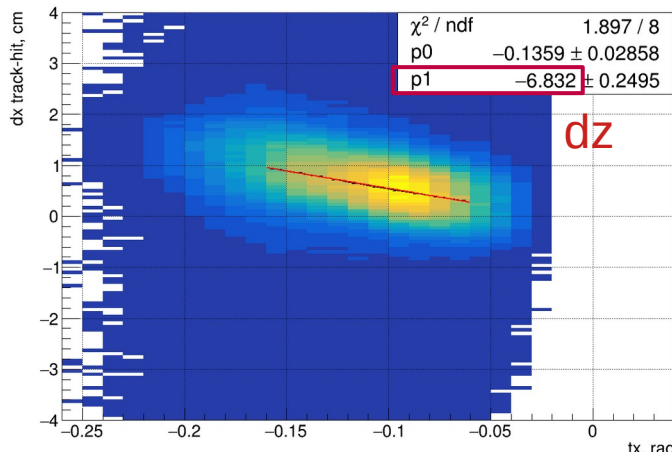
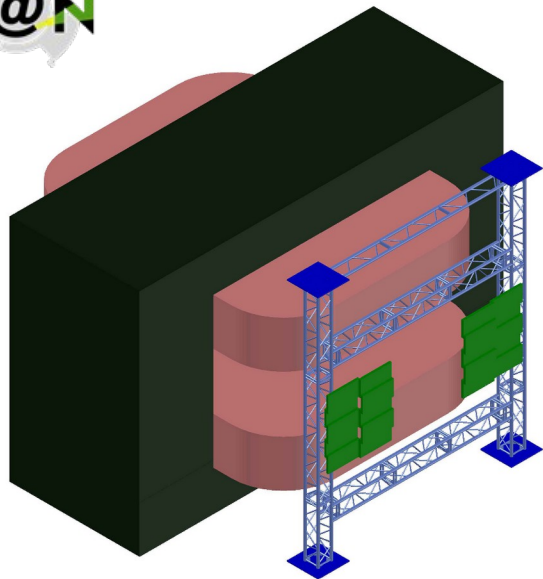


$$Y = \frac{T_L - T_R}{2} * V$$

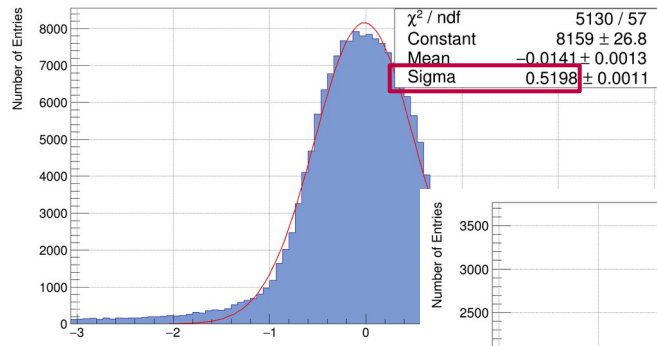
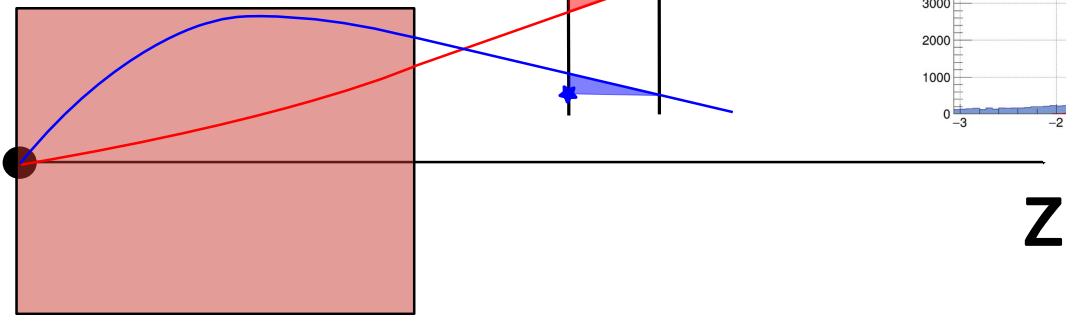


Plane	Strip	MeanFit	Mean
0	47	0.0703125	0.0703125
0	46	0.0703125	0.0703125
0	45	-0.0234375	-0.0234375
0	44	0.140625	0.140625
0	43	0.0703125	0.0703125
0	42	-0.0234375	-0.0234375
0	41	-0.0234375	-0.0234375
0	40	10.9475	0.870028
0	39	-0.09375	-0.09375
0	38	0.140625	0.140625
0	37	0.0703125	0.0703125
0	36	-2.39021e-13	-1.82656e-17
0	35	-0.09375	-0.09375
0	34	0.09375	0.09375
0	33	-0.046875	-0.046875
0	32	-7.12154e-14	-1.31062e-17
0	31	-2.05224e-13	-0
0	30	-2.79432e-13	-2.53863e-17
0	29	1.10247e-13	2.93402e-17
0	28	0.046875	0.046875
0	27	-0.09375	-0.09375
0	26	0.046875	0.046875
0	25	0.046875	0.046875
0	24	0.046875	0.046875
0	23	-0.046875	-0.046875
0	22	-0.09375	-0.09375
0	21	-0.046875	-0.046875
0	20	0.046875	0.046875
0	19	-0.046875	-0.046875
0	18	1.34638e-14	2.22756e-17
0	17	-0.046875	-0.046875
0	16	-3.39297e-13	3.7387e-18
0	15	-5.12775e-16	1.08957e-17
0	14	0.0703125	0.0703125
0	13	-0.140625	-0.140625
0	12	0.046875	0.046875
0	11	-2.23705e-13	7.01002e-18
0	10	5.70026e-13	-6.91473e-18

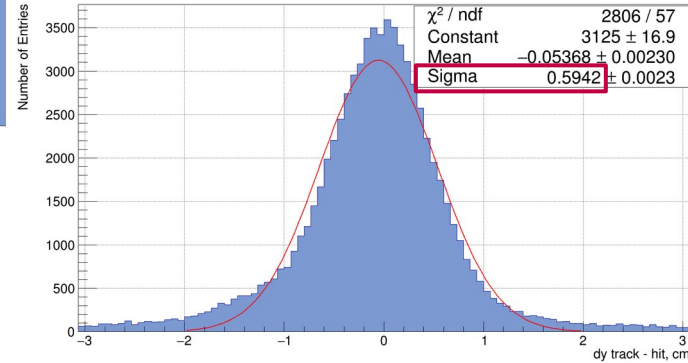
Geometry alignment of the TOF400.



geom **real**



$\sigma_x(\text{track-hit}) = 5,2 \text{ mm}$
 $\sigma_y(\text{track-hit}) = 6 \text{ mm}$

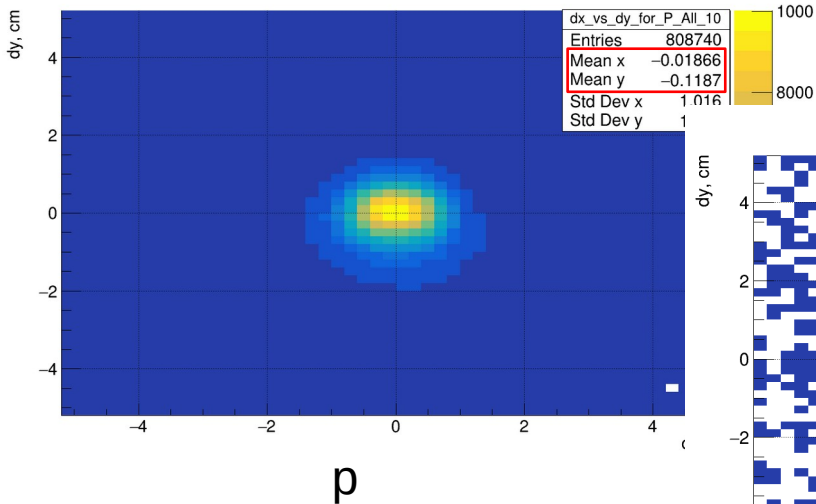




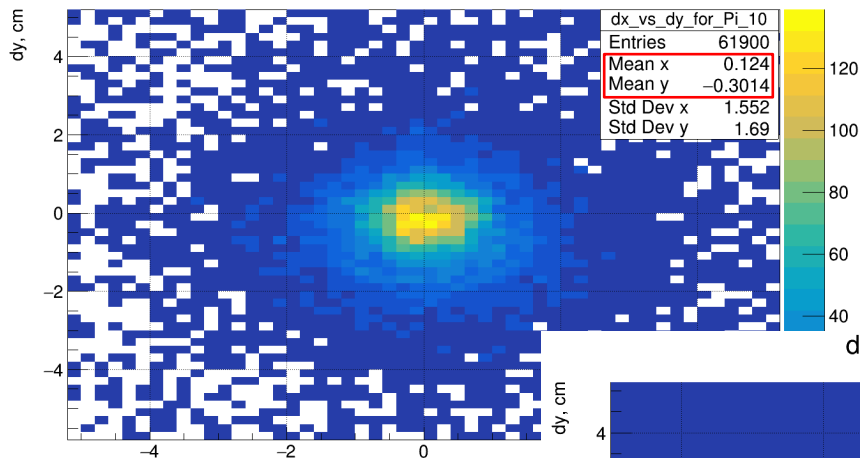
Geometry alignment of the TOF400.

Z + 6,5cm -> Y (Plane) -> Z (Plane) -> X (Plane) -> Z (Plane) -> XY (Plane).

dx_vs_dy_for_P_All_10



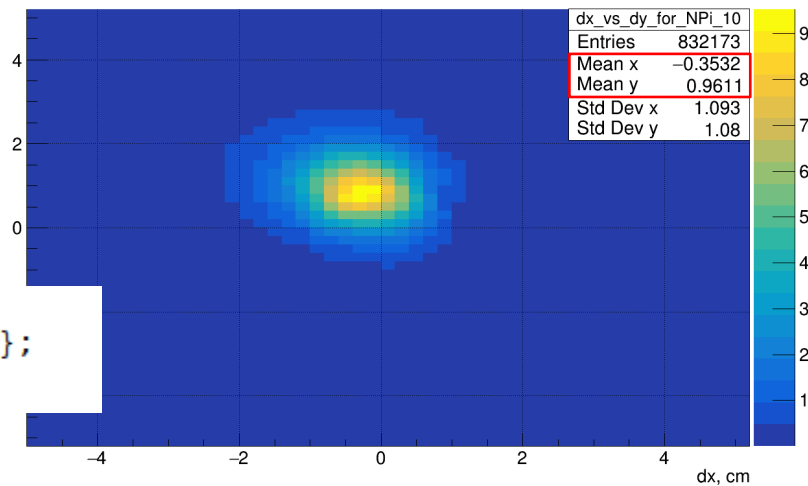
dx_vs_dy_for_Pi_10



π^+

π^-

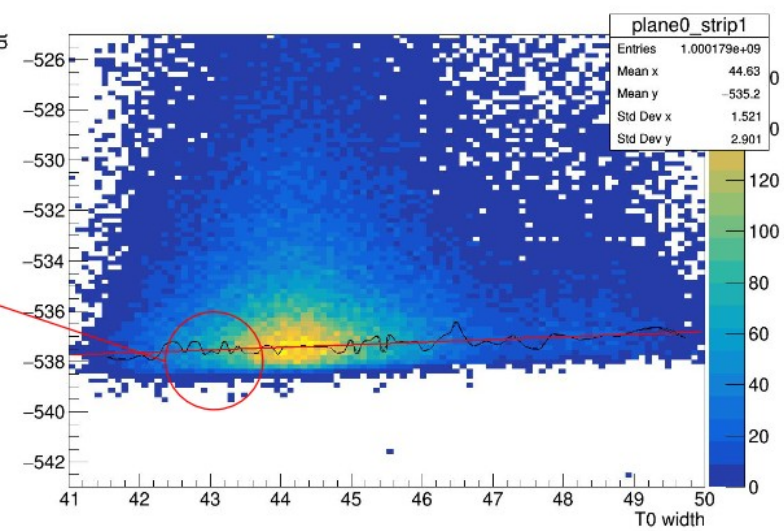
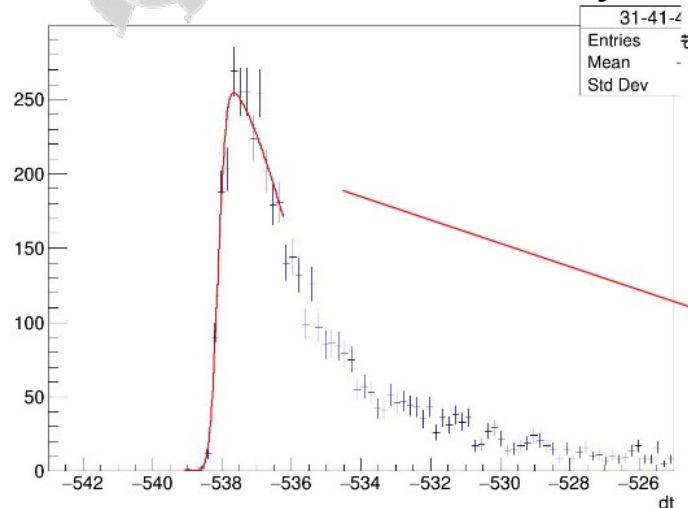
dx_vs_dy_for_NPi_10



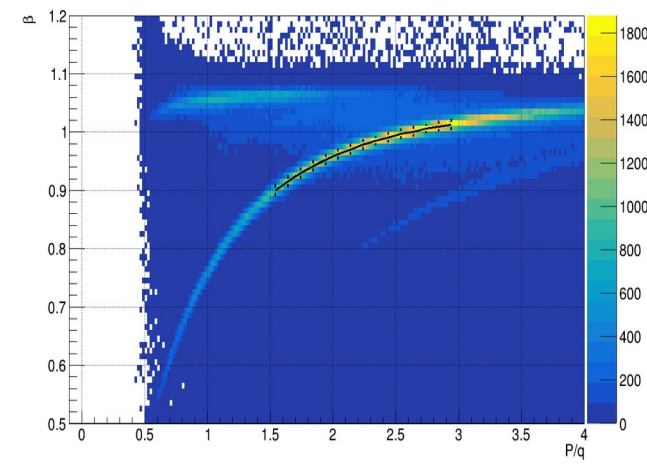
```
const Double_t corr_X_box2[5] = {0.926, 0.717, 0.067, -0.579, -0.178};
const Double_t corr_Y_box2[5] = {-0.293, -0.299, -0.204, -0.143, 0.948};
const Double_t corr_Z_box2[5] = {1.61, 1.22, 0.57, -0.083, 0.922};
```

Slewing correction of the TOF400.

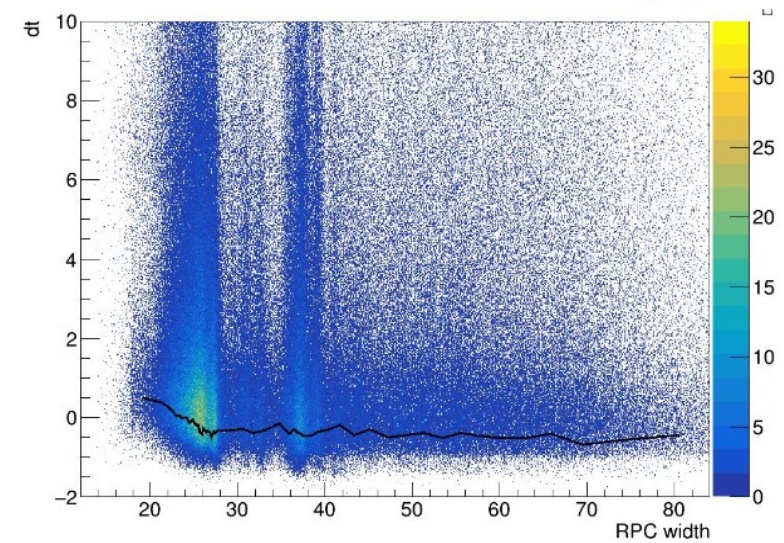
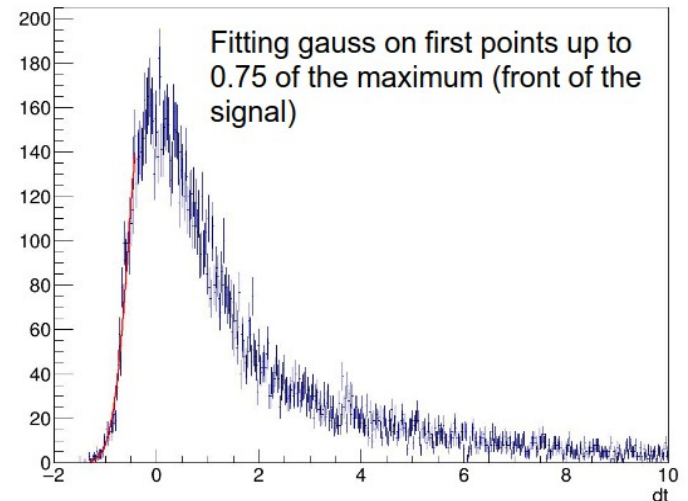
Presented by Mikhail Mamaev at 10th BM@N collaboration meeting.



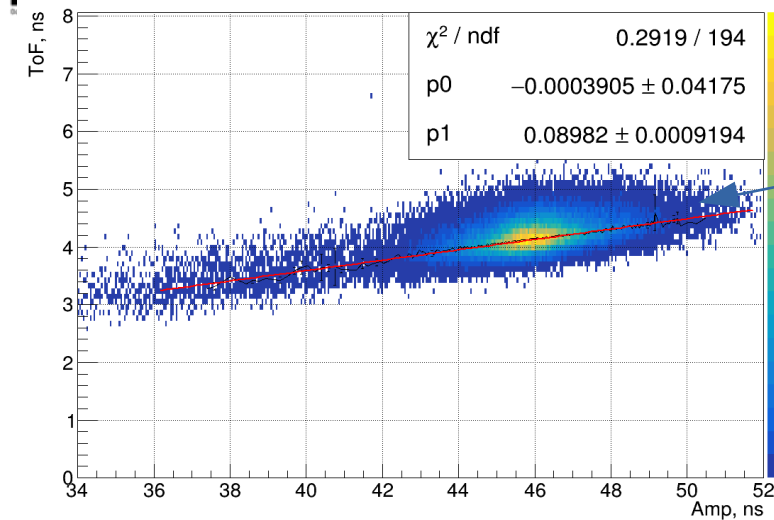
Step 1:
Correction for T0
by line



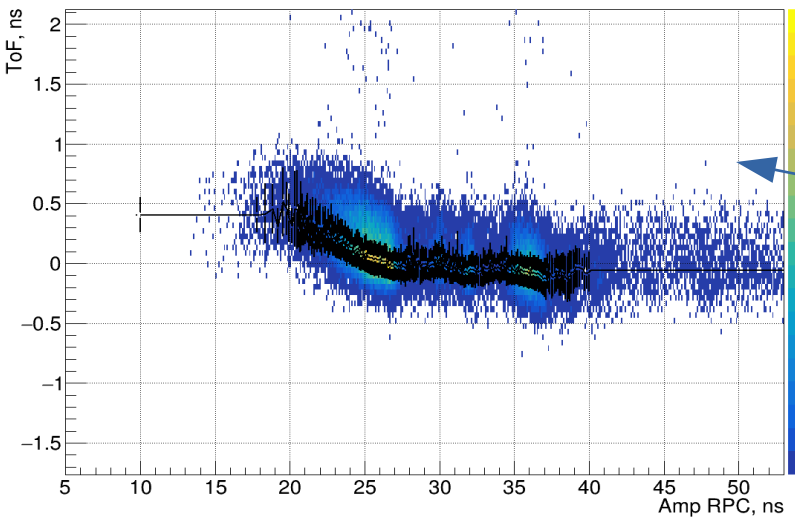
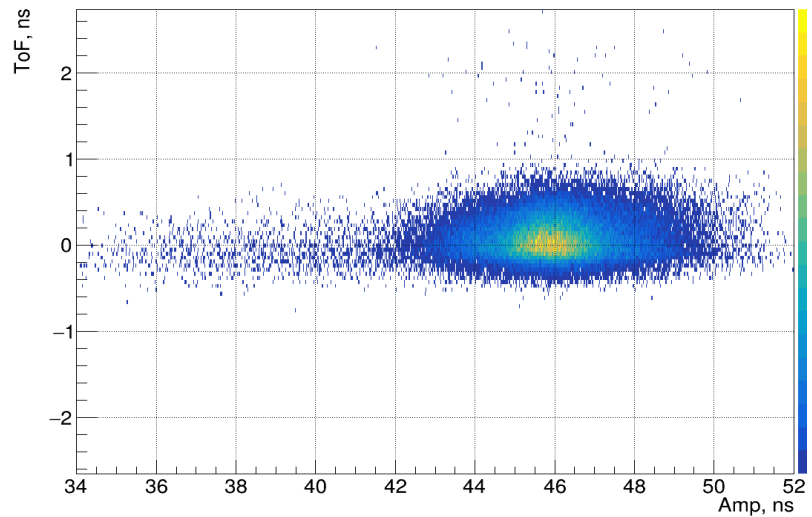
Step 2:
Correction for RPC



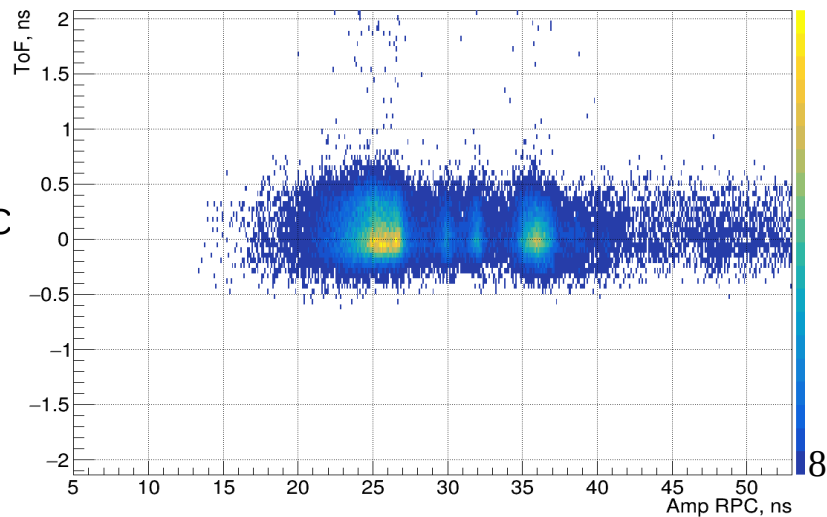
Slewing correction of the TOF400 by $\pi^{+(-)}$ particles.



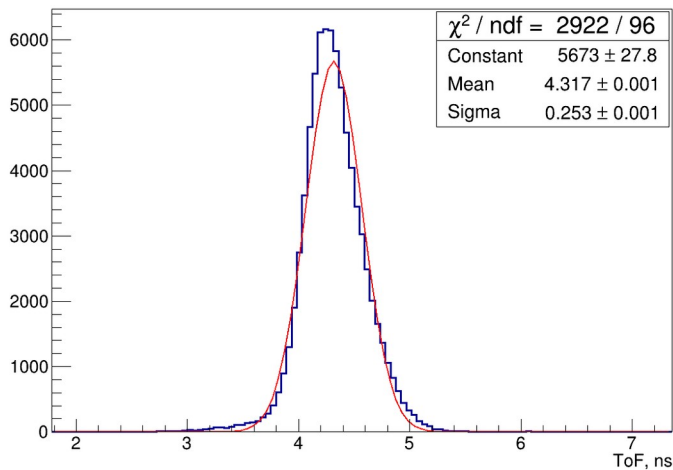
Step 1:
Correction for T0
by line



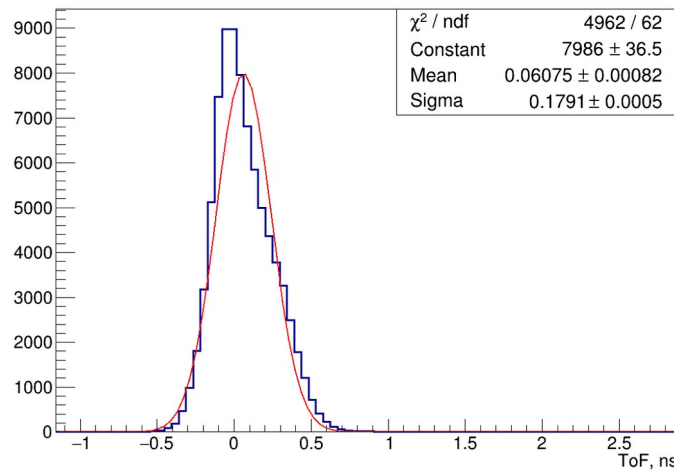
Step 2:
Correction for RPC



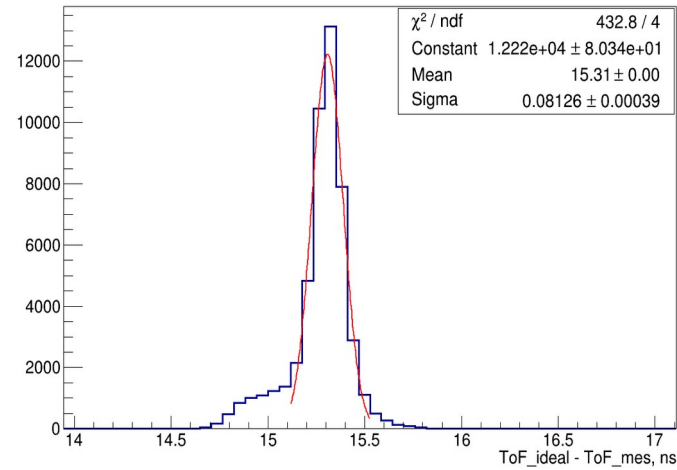
Time shift correction of the TOF400.



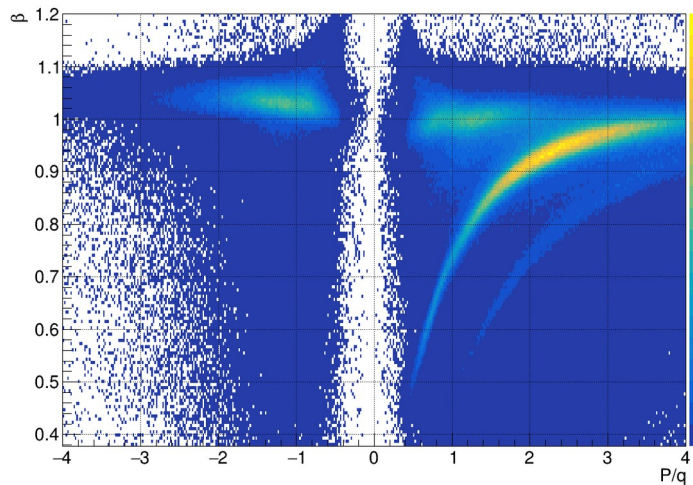
ToF for π^+ band w/o Slewing



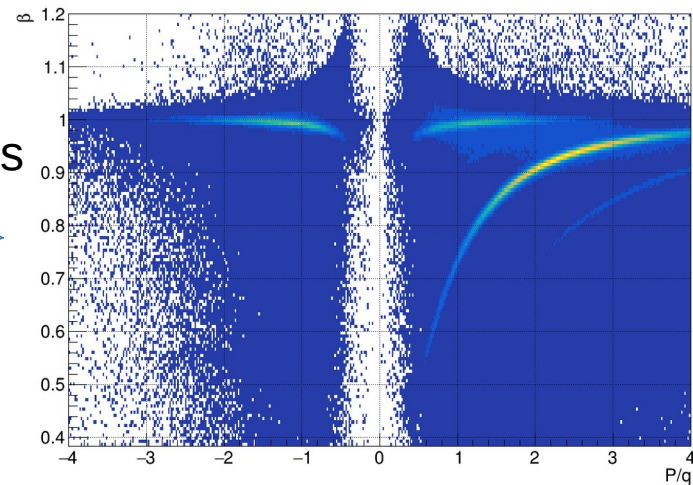
ToF for π^+ band with Slewing

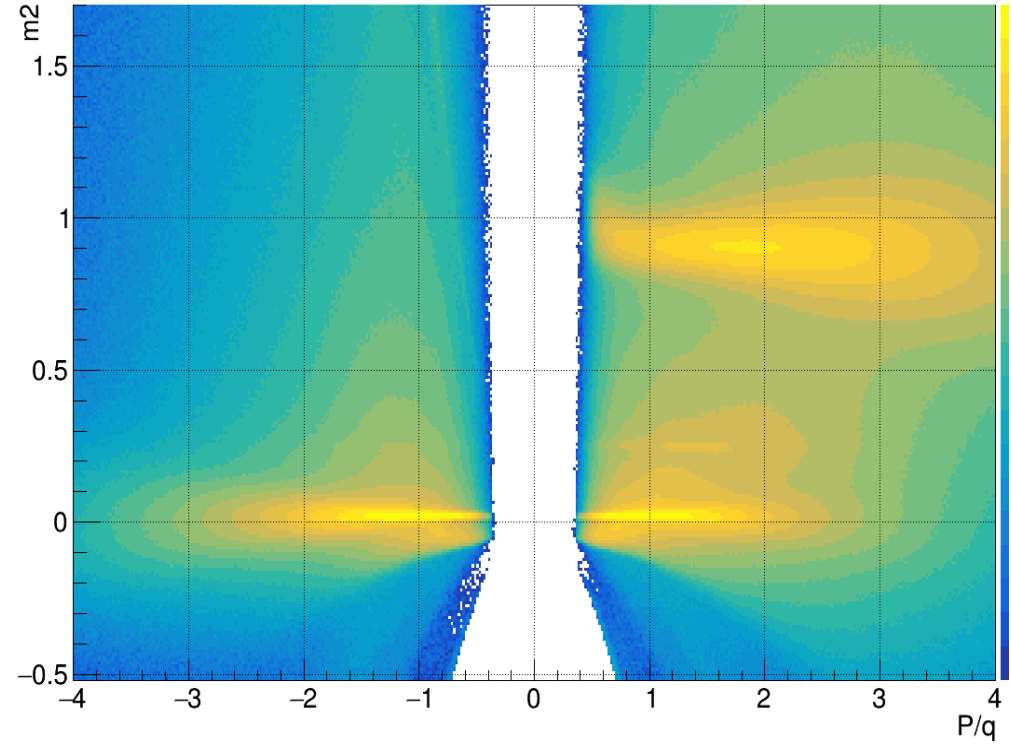
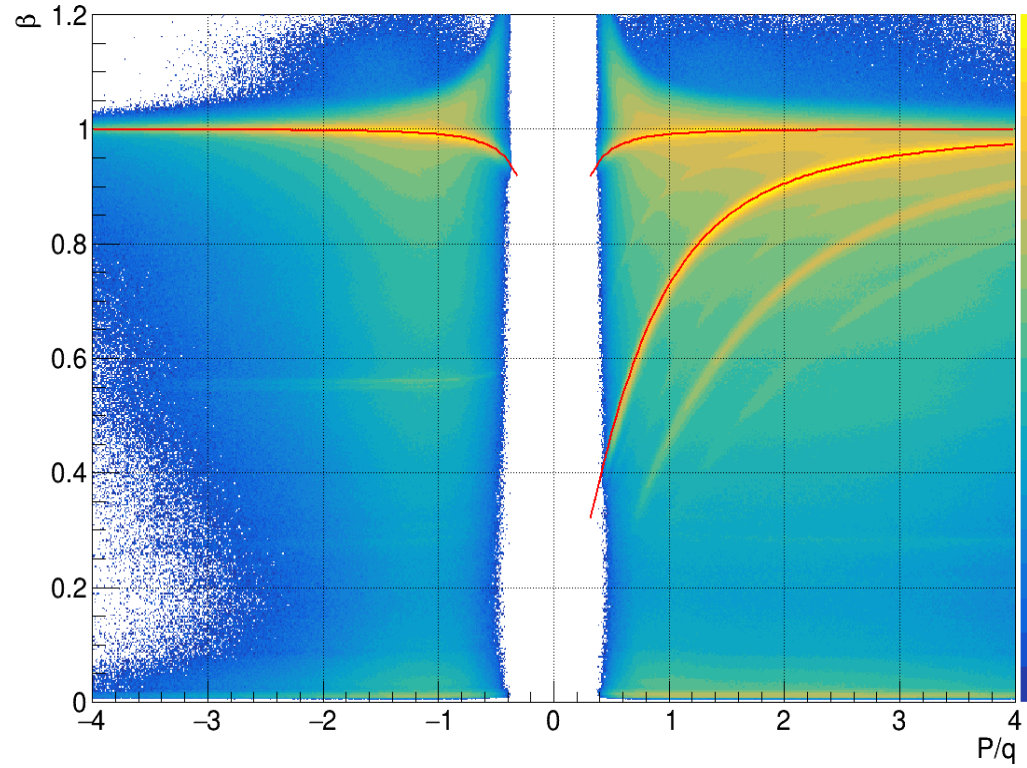


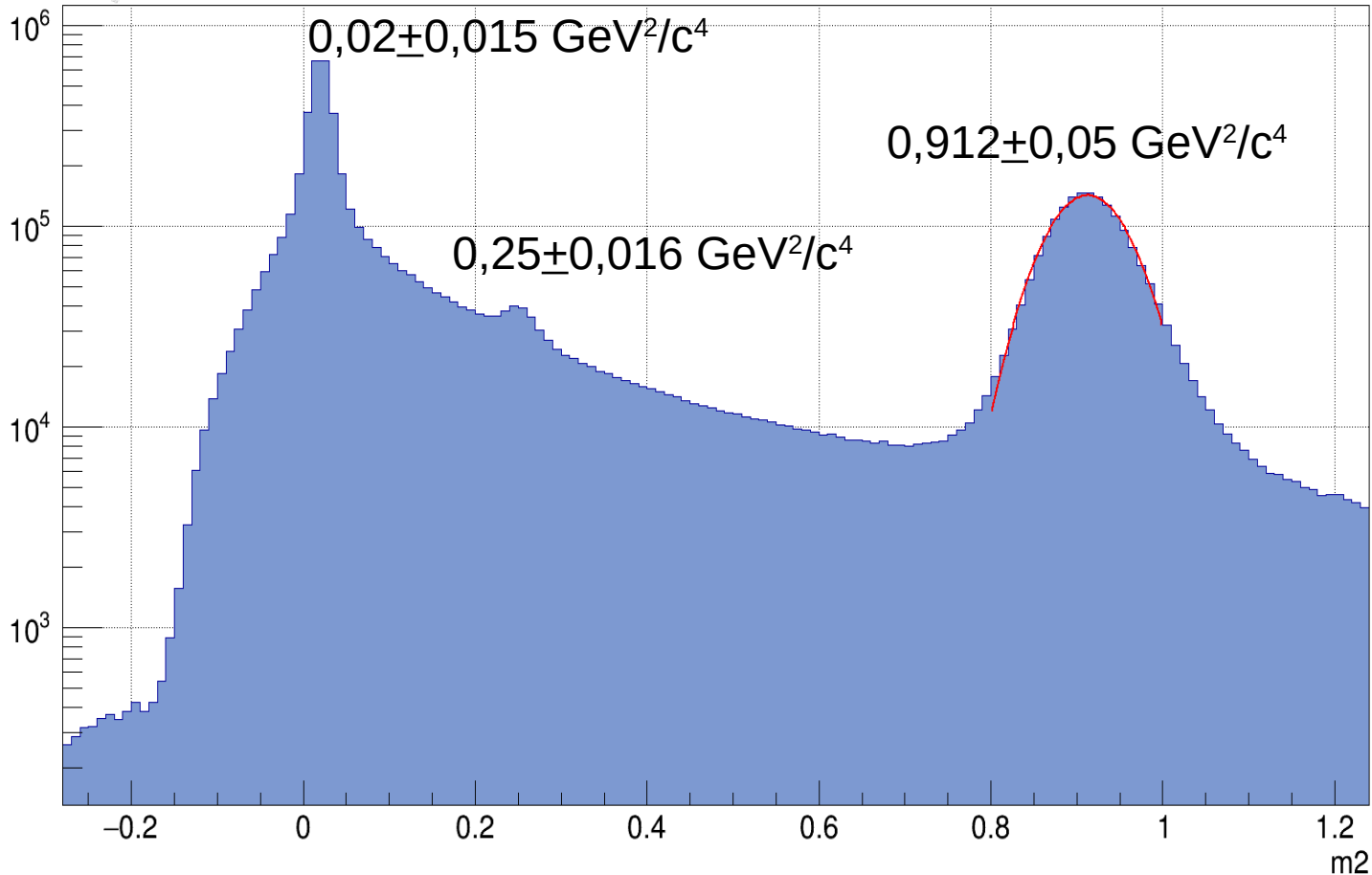
ToF_{ideal} — ToF_{mes} for π^+ band



After all corrections







$$m^2(\pi) = 0,018 \text{ GeV}^2/c^4$$

$$m^2(k) = 0,243 \text{ GeV}^2/c^4$$

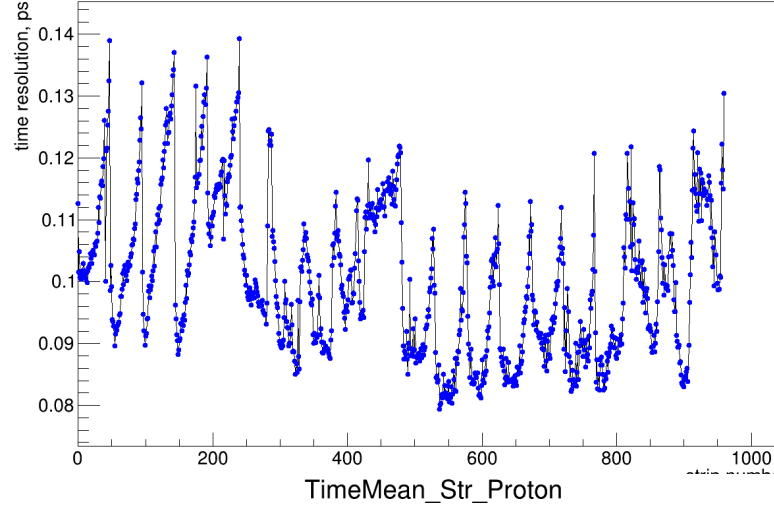
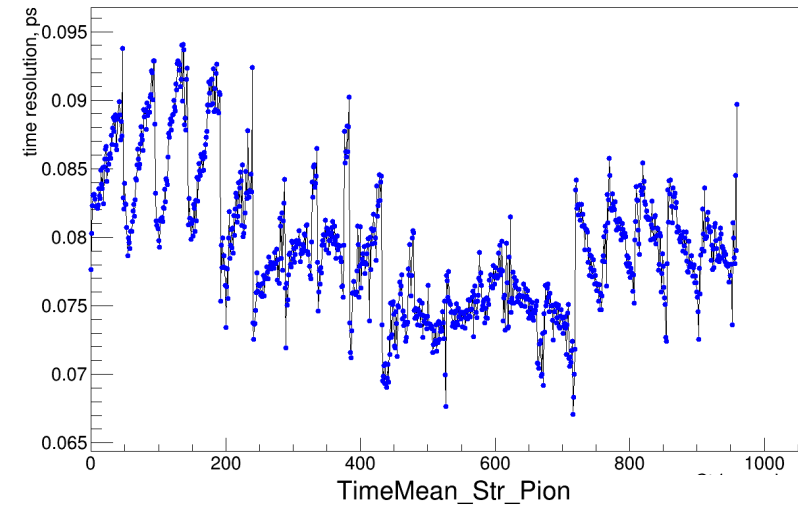
$$m^2(p) = 0,880 \text{ GeV}^2/c^4$$

Spector of m^2 in 1-1,1 GeV/c momentum range.

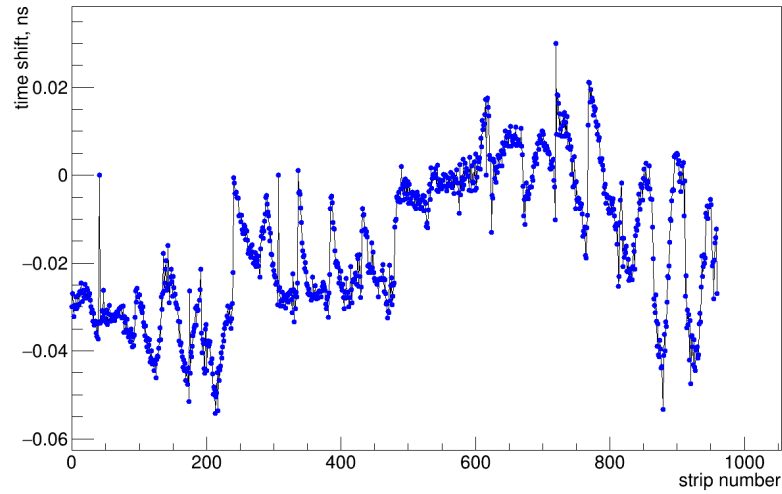
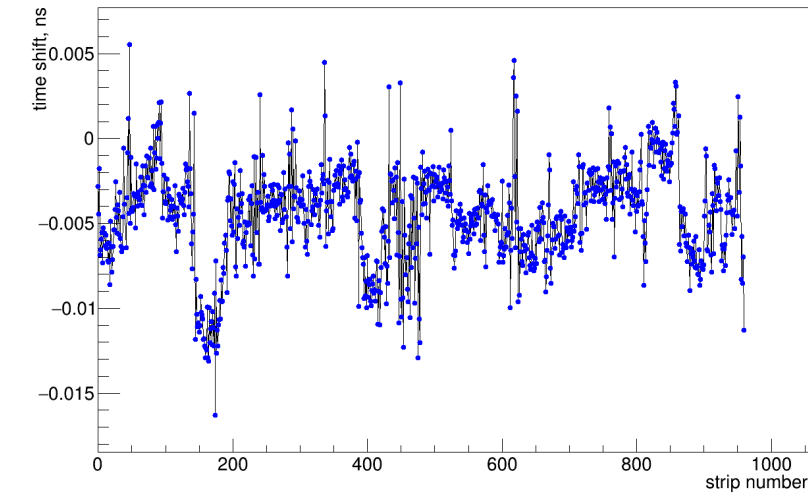
ToF performance.

TimeRes_Str_Pion

TimeRes_Str_Proton

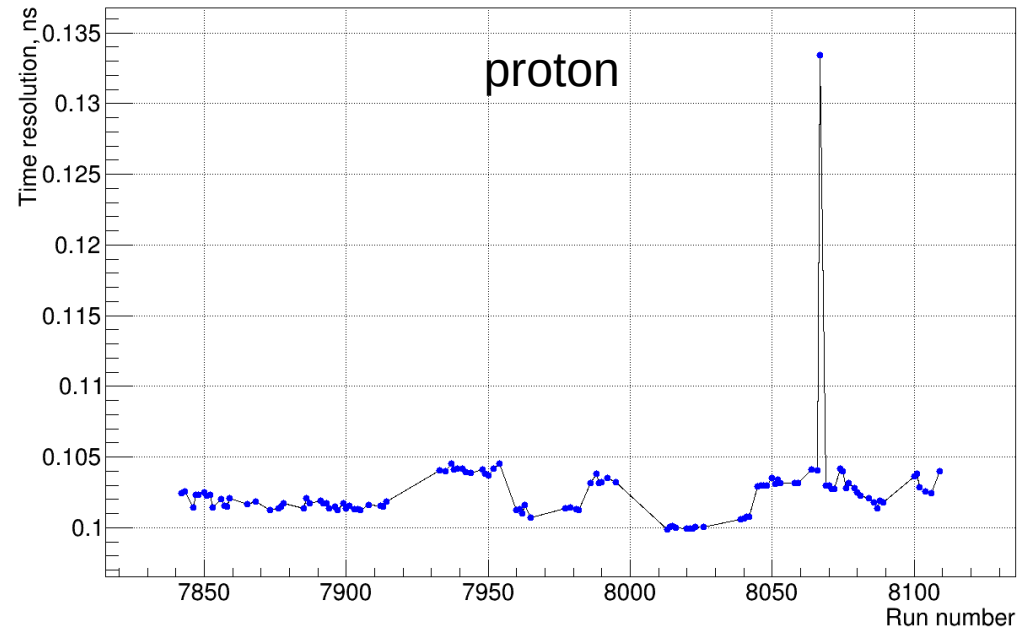
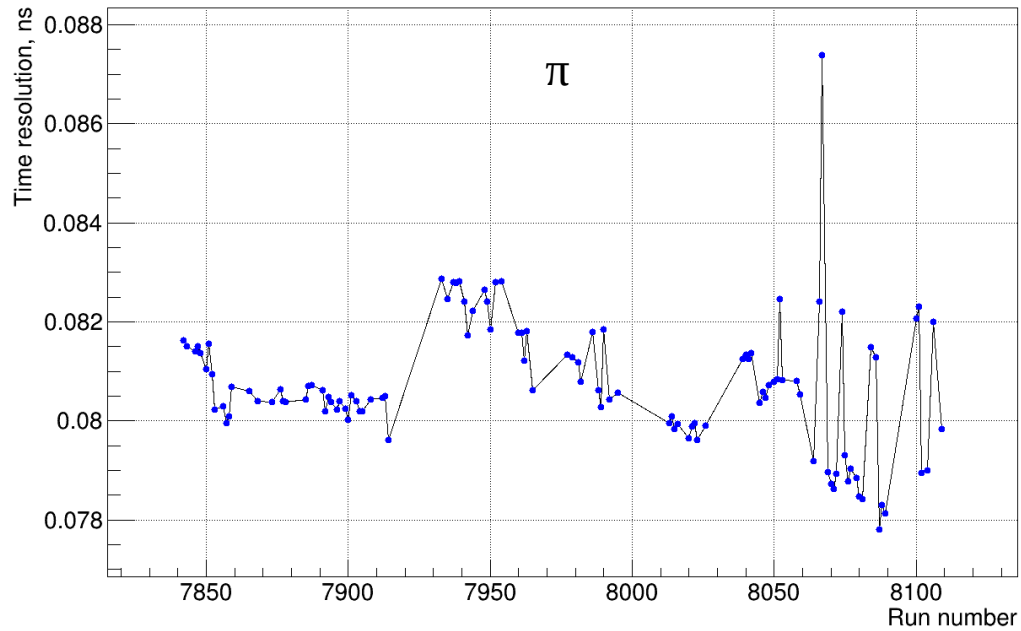


What should we choose for time calibration, π or p ?



ToF performance.

Time resolution during the data taking.



- The main work on calibrating the TOF 400 system has been completed.
- After proton peak correction, all calibrations will be pushed to git.
- The problem of mismatching particles of different charges has not been solved.
- The problem of choosing the type of particle for time calibration has not been solved.

Thank you for your attention!