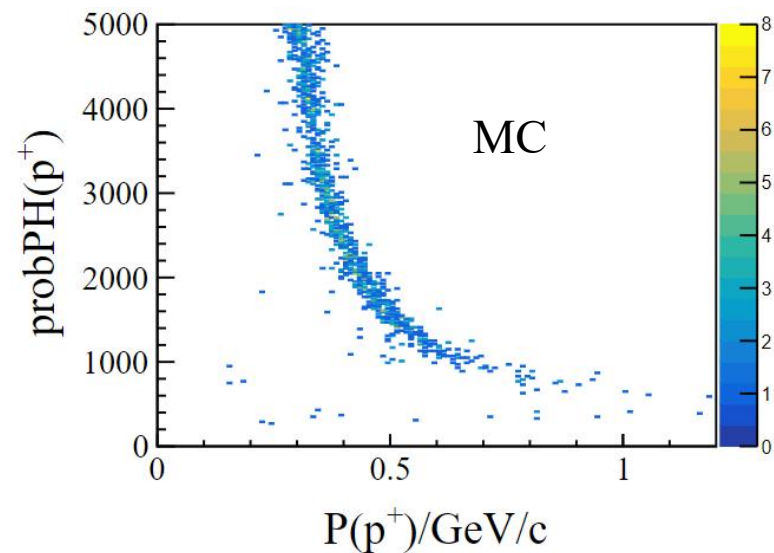
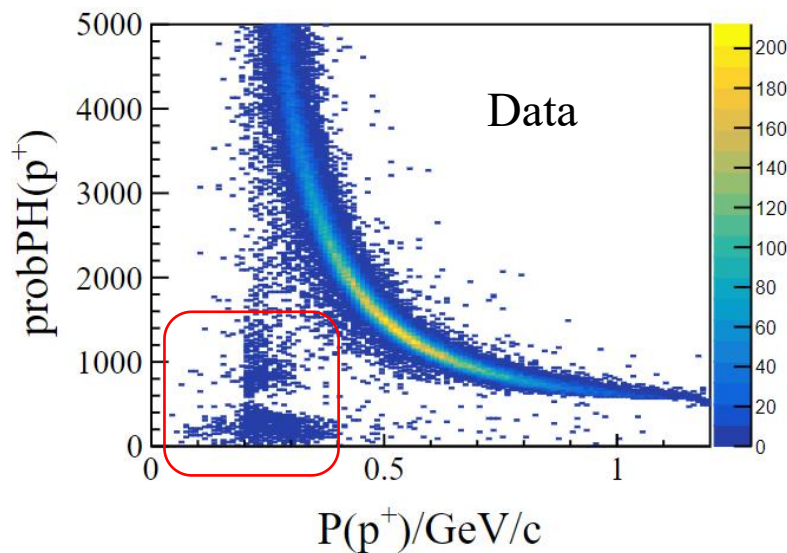
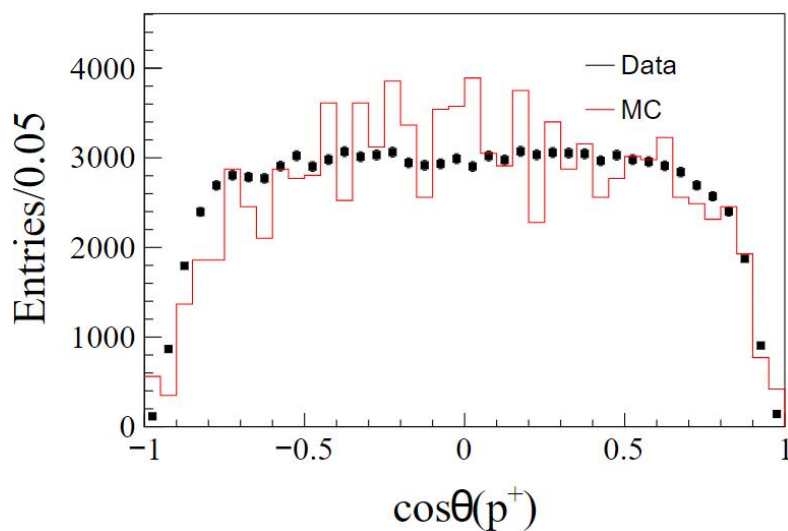
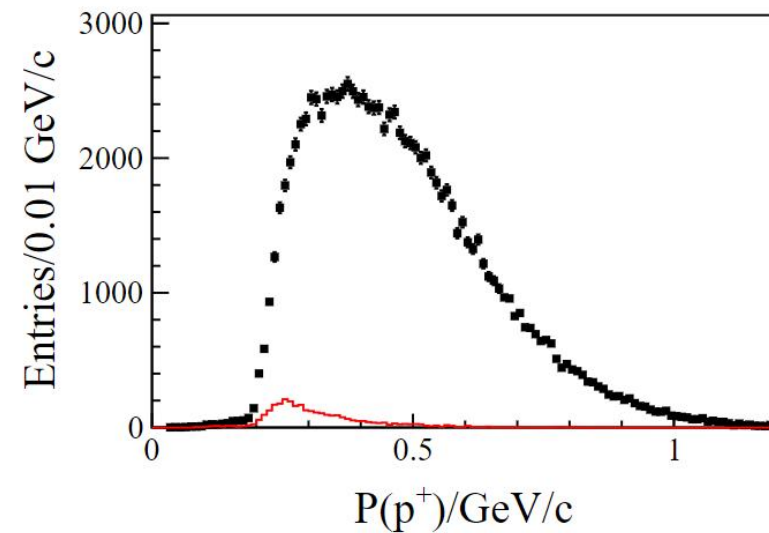
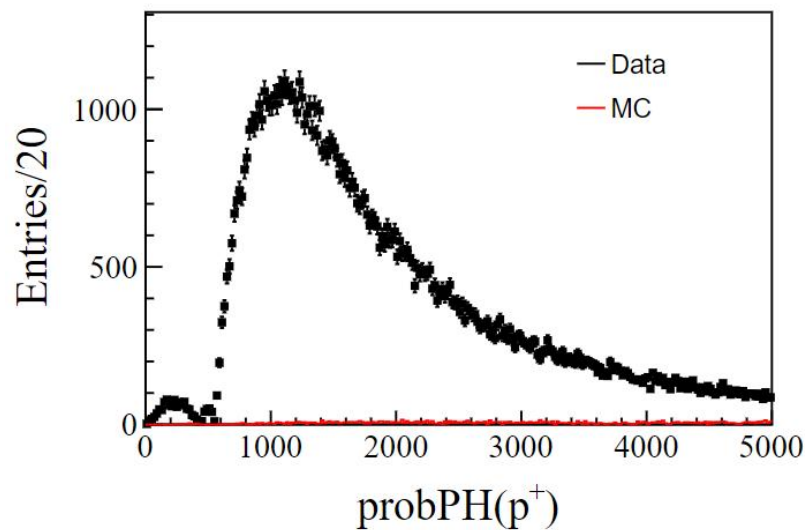
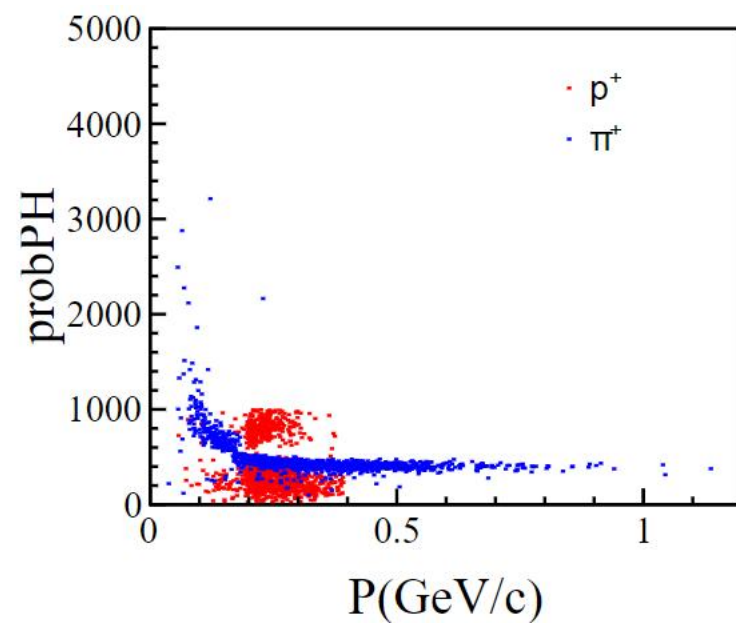
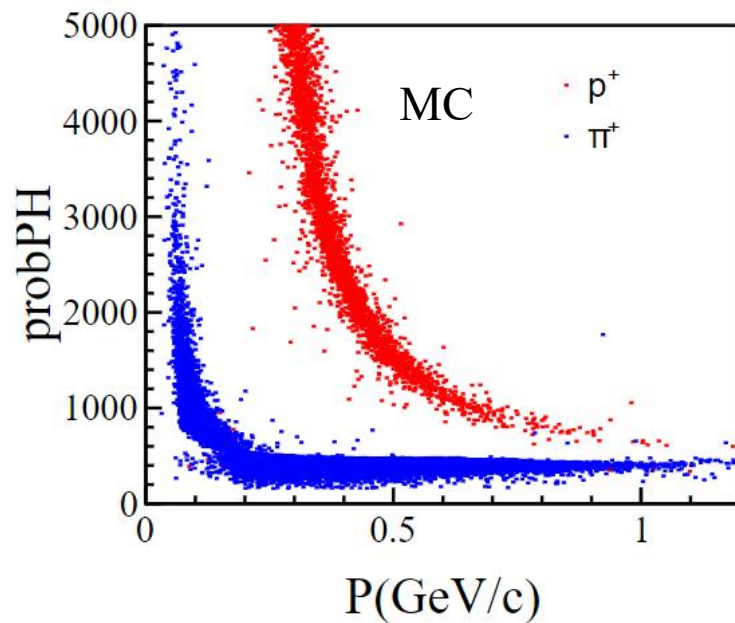
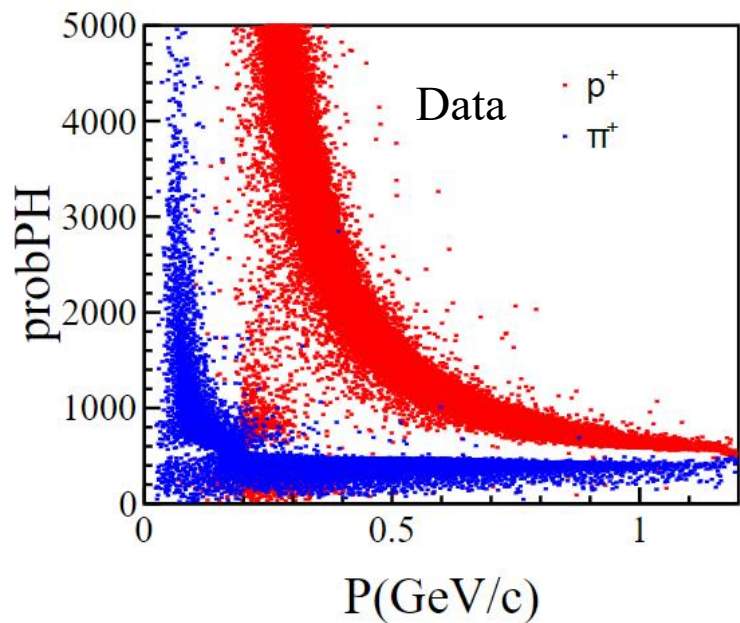


Back Up: Study of p^+

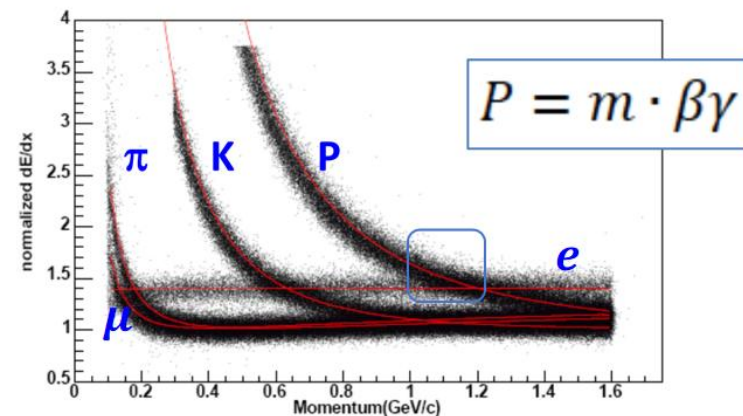
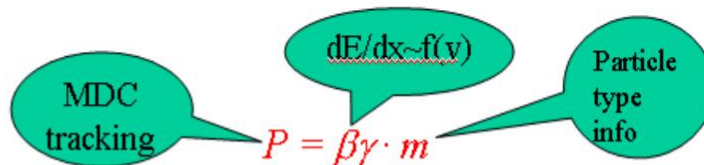
- Select the p^+ with the highest energy for at least one p^+ event.



Back Up: Study of p^+

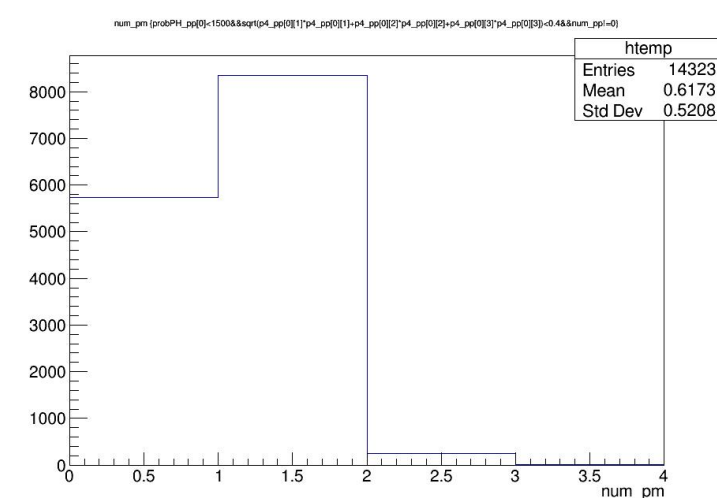
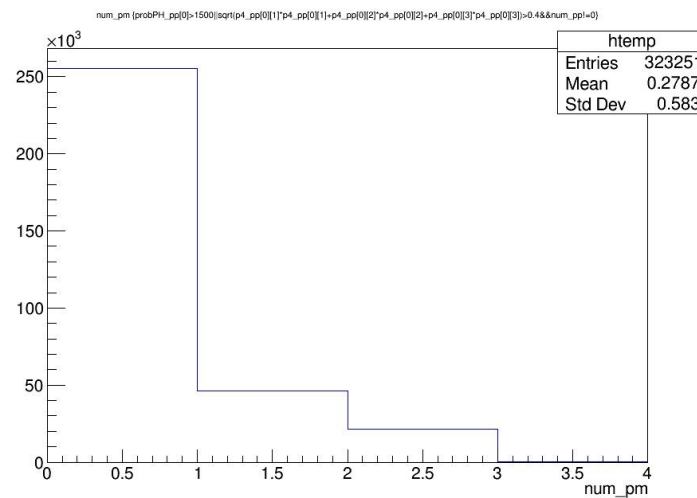
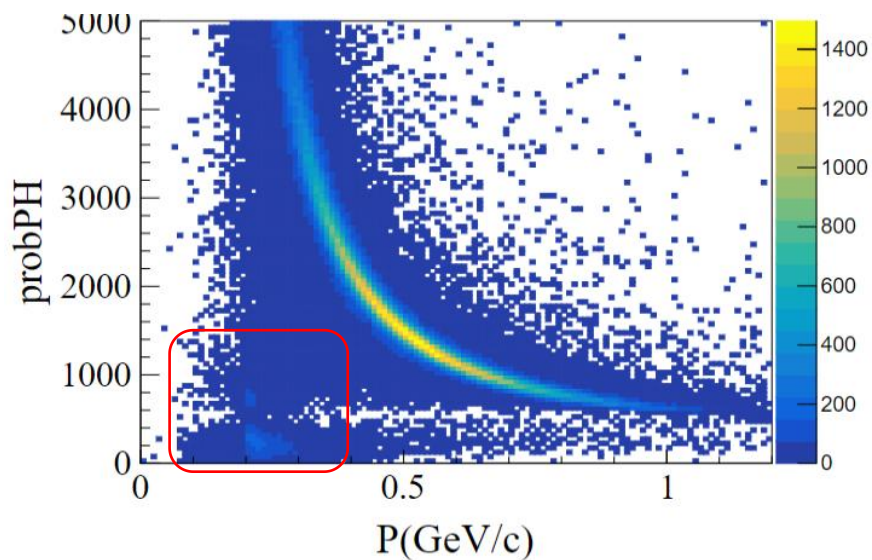
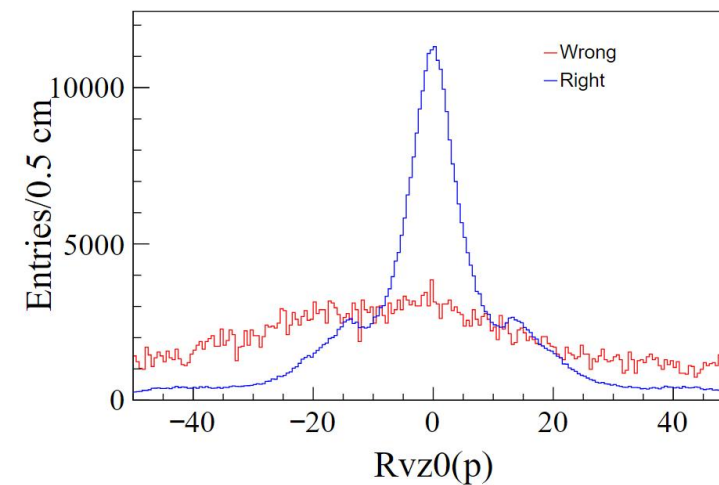
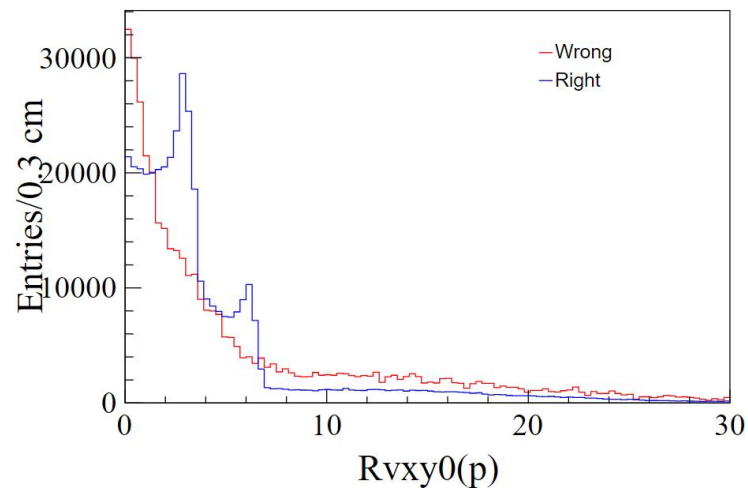
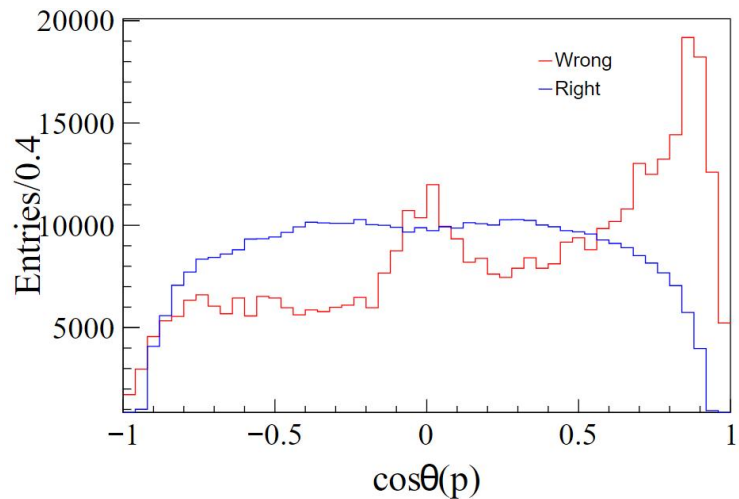


$$\chi = \frac{dE/dx(\text{测量}) - dE/dx(\text{期望})}{\sigma(dE/dx)}$$



- 根据不同粒子的假设得到不同的 χ 值，比较 χ 值大小，可以得到该粒子属于某种粒子的几率，从而实现粒子鉴别

Back Up: Study of p^+



Back Up: Study of p^+

```
if (runNo >= 9947 && runNo <=10878 || runNo>= 27255 && runNo <= 28236 ||
{
    m_offsetCorr[i] = offsetCorr(i, charge, ptrk, cost);
    m_sigmaCorr[i] = sigmaCorr(i, charge, ptrk, cost);
    m_chi[i] = (sep - m_offsetCorr[i]) / m_sigmaCorr[i];
}
//CT
if(fabs(m_chi[i]) < chitemp) chitemp = fabs(m_chi[i]);
double ppp = pdfCalculate(m_chi[i],1);
if(fabs(ppp) > pdftemp) pdftemp = fabs(ppp);
```

```
DedxPID::particleIDCalculation()::runNo = 56789
DedxPID::particleIDCalculation()::i = 0
DedxPID::particleIDCalculation()::m_chi[i] = -2.40537
DedxPID::particleIDCalculation()::sep = -2.40537
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56789
DedxPID::particleIDCalculation()::i = 1
DedxPID::particleIDCalculation()::m_chi[i] = -1.29414
DedxPID::particleIDCalculation()::sep = -1.29414
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56789
DedxPID::particleIDCalculation()::i = 2
DedxPID::particleIDCalculation()::m_chi[i] = -1.9059
DedxPID::particleIDCalculation()::sep = -1.98227
DedxPID::particleIDCalculation()::m_offsetCorr[i] = -0.0408712
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1.01862
DedxPID::particleIDCalculation()::runNo = 56789
DedxPID::particleIDCalculation()::i = 3
DedxPID::particleIDCalculation()::m_chi[i] = -6.26253
DedxPID::particleIDCalculation()::sep = -6.26253
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56789
```

```
DedxPID::particleIDCalculation()::i = 4
DedxPID::particleIDCalculation()::m_chi[i] = -0.927364
DedxPID::particleIDCalculation()::sep = -7.12653
DedxPID::particleIDCalculation()::m_offsetCorr[i] = -6.19917
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
pp:
```

```
DedxPID::particleIDCalculation()::runNo = 56792
DedxPID::particleIDCalculation()::i = 0
DedxPID::particleIDCalculation()::m_chi[i] = -3.48899
DedxPID::particleIDCalculation()::sep = -3.48899
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56792
DedxPID::particleIDCalculation()::i = 1
DedxPID::particleIDCalculation()::m_chi[i] = -2.95887
DedxPID::particleIDCalculation()::sep = -2.95887
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56792
DedxPID::particleIDCalculation()::i = 2
DedxPID::particleIDCalculation()::m_chi[i] = -3.07126
DedxPID::particleIDCalculation()::sep = -3.07126
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56792
DedxPID::particleIDCalculation()::i = 3
DedxPID::particleIDCalculation()::m_chi[i] = -4.45551
DedxPID::particleIDCalculation()::sep = -4.45551
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56792
```

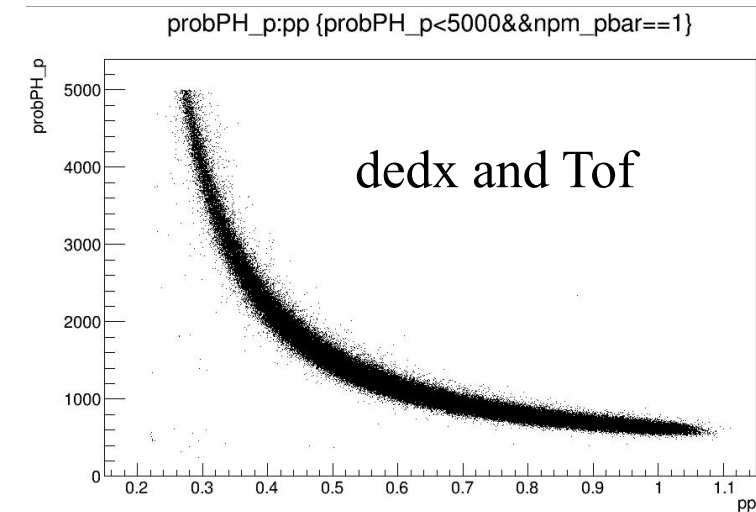
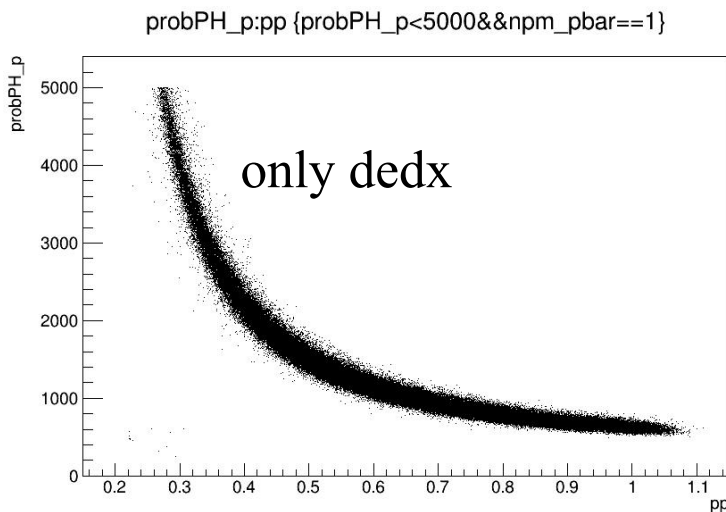
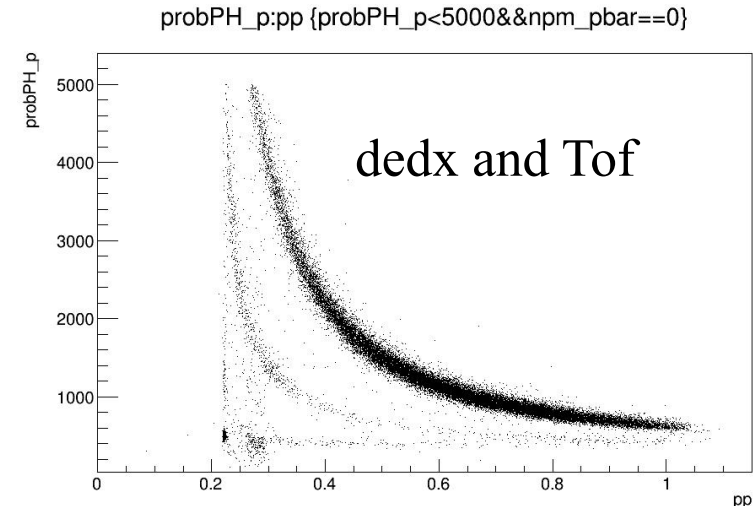
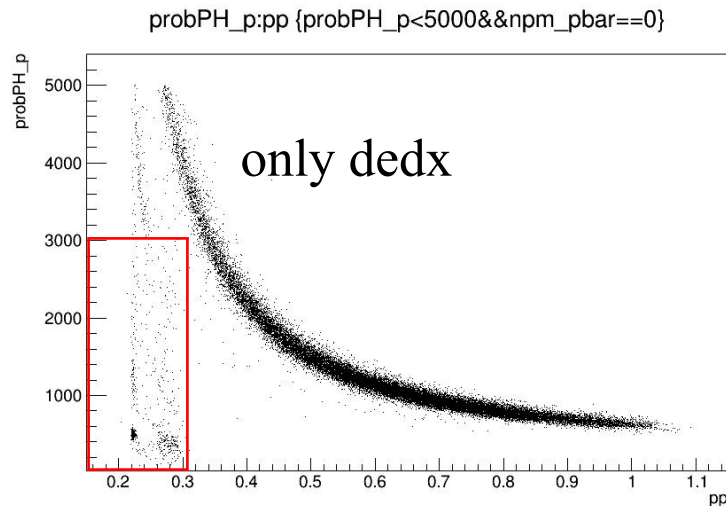
```
DedxPID::particleIDCalculation()::i = 4
DedxPID::particleIDCalculation()::m_chi[i] = -0.627908
DedxPID::particleIDCalculation()::sep = -4.93609
DedxPID::particleIDCalculation()::m_offsetCorr[i] = -4.30818
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
pp:
```

```
DedxPID::particleIDCalculation()::runNo = 56792
DedxPID::particleIDCalculation()::i = 0
DedxPID::particleIDCalculation()::m_chi[i] = -4.74392
DedxPID::particleIDCalculation()::sep = -4.74392
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56792
DedxPID::particleIDCalculation()::i = 1
DedxPID::particleIDCalculation()::m_chi[i] = -4.65567
DedxPID::particleIDCalculation()::sep = -4.65567
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56792
DedxPID::particleIDCalculation()::i = 2
DedxPID::particleIDCalculation()::m_chi[i] = -4.6269
DedxPID::particleIDCalculation()::sep = -4.71282
DedxPID::particleIDCalculation()::m_offsetCorr[i] = -0.0859271
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56792
DedxPID::particleIDCalculation()::i = 3
DedxPID::particleIDCalculation()::m_chi[i] = -5.06013
DedxPID::particleIDCalculation()::sep = -5.06013
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56792
```

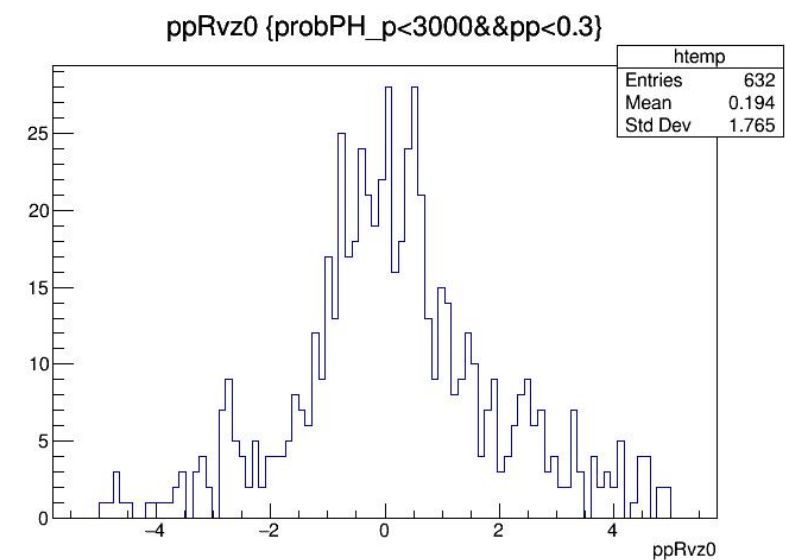
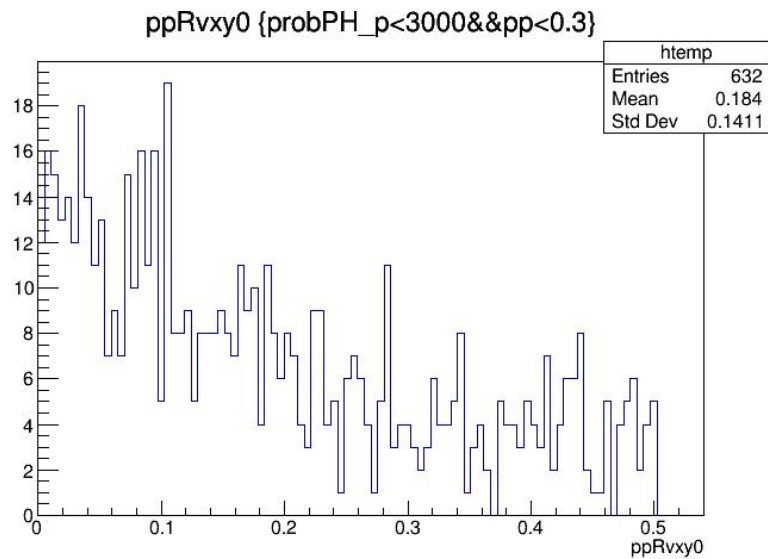
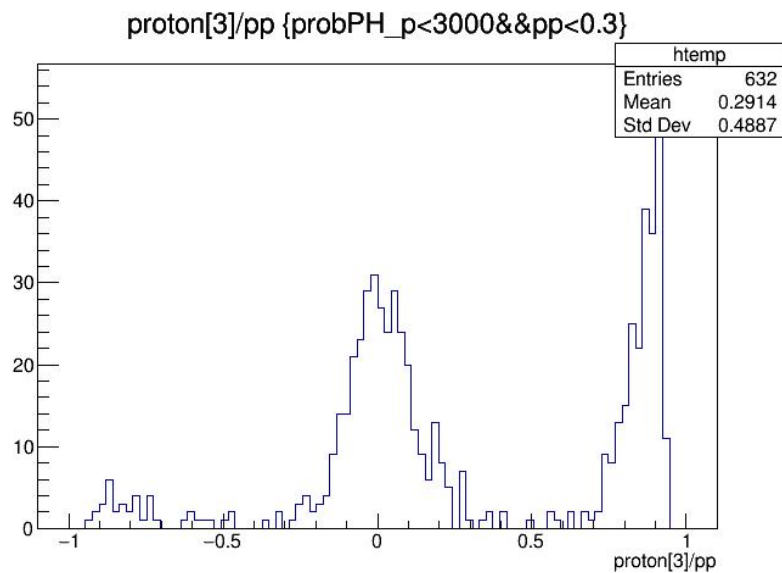
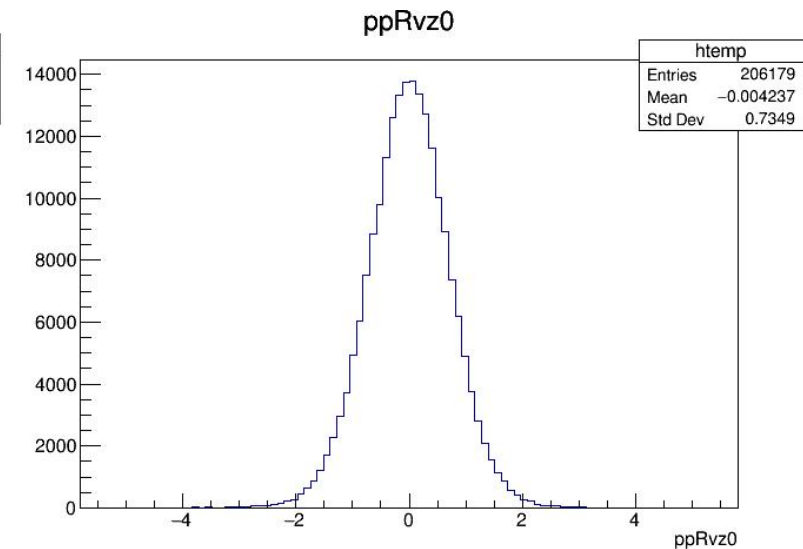
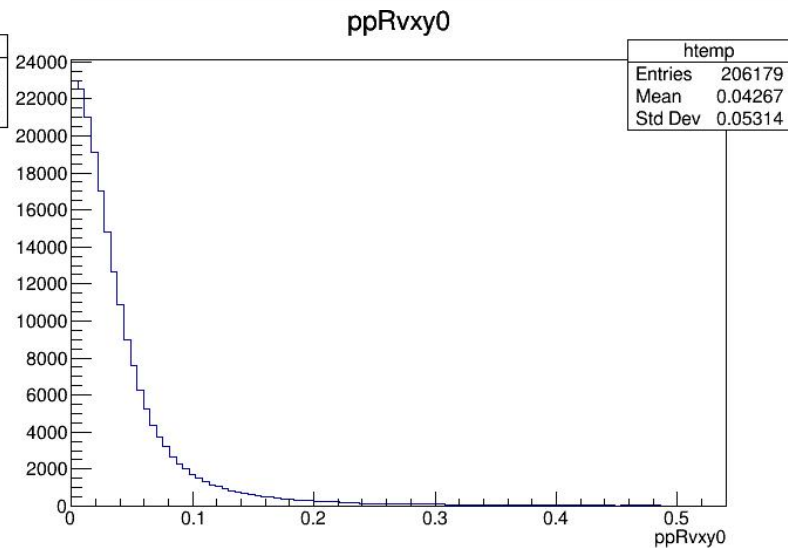
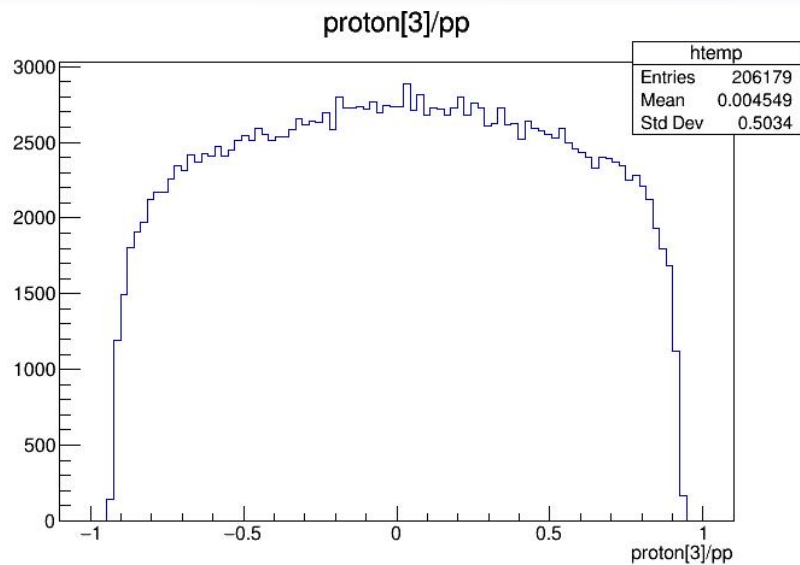
```
DedxPID::particleIDCalculation()::i = 4
DedxPID::particleIDCalculation()::m_chi[i] = -1.07277
DedxPID::particleIDCalculation()::sep = -5.12897
DedxPID::particleIDCalculation()::m_offsetCorr[i] = -4.0562
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
pp:
```

Back Up: Study of p^+

- Do a test use the **filtered $J/\psi \rightarrow p\bar{p}\pi^+\pi^-$ data**, we try two PID method: one is use dedx and Tof, and another is only use dedx.



Back Up: Study of p^+



Back Up: Study of p^+

- Do a test use the **filtered $J/\psi \rightarrow p\bar{p}\pi^+\pi^-$ data**, we try two PID method: one is use dedx and Tof, and another is only use dedx.

```
DedxPID::particleIDCalculation()::runNo = 56788
DedxPID::particleIDCalculation()::i = 0
DedxPID::particleIDCalculation()::m_chi[i] = 0.245249
DedxPID::particleIDCalculation()::sep = 0.245249
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56788
DedxPID::particleIDCalculation()::i = 1
DedxPID::particleIDCalculation()::m_chi[i] = -0.620154
DedxPID::particleIDCalculation()::sep = -0.620154
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56788
DedxPID::particleIDCalculation()::i = 2
DedxPID::particleIDCalculation()::m_chi[i] = -2.18988
DedxPID::particleIDCalculation()::sep = -3.23691
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0.90504
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1.8914
DedxPID::particleIDCalculation()::runNo = 56788
DedxPID::particleIDCalculation()::i = 3
DedxPID::particleIDCalculation()::m_chi[i] = -10.8651
DedxPID::particleIDCalculation()::sep = -10.8651
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56788
DedxPID::particleIDCalculation()::i = 4
DedxPID::particleIDCalculation()::m_chi[i] = -2.16855
DedxPID::particleIDCalculation()::sep = -11.7614
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 12.3837
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 11.1342
pp
npip:1 npim:2 npp:1 npm:0 nKp:0 nKm:0
```

```
DedxPID::particleIDCalculation()::i = 0
DedxPID::particleIDCalculation()::m_chi[i] = -2.94943
DedxPID::particleIDCalculation()::sep = -2.94943
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56788
DedxPID::particleIDCalculation()::i = 1
DedxPID::particleIDCalculation()::m_chi[i] = -2.54921
DedxPID::particleIDCalculation()::sep = -2.54921
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56788
DedxPID::particleIDCalculation()::i = 2
DedxPID::particleIDCalculation()::m_chi[i] = -2.90835
DedxPID::particleIDCalculation()::sep = -3.07141
DedxPID::particleIDCalculation()::m_offsetCorr[i] = -0.163064
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56788
DedxPID::particleIDCalculation()::i = 3
DedxPID::particleIDCalculation()::m_chi[i] = -5.45408
DedxPID::particleIDCalculation()::sep = -5.45408
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56788
DedxPID::particleIDCalculation()::i = 4
DedxPID::particleIDCalculation()::m_chi[i] = -1.79042
DedxPID::particleIDCalculation()::sep = -5.83357
DedxPID::particleIDCalculation()::m_offsetCorr[i] = -4.04315
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
pp
npip:1 npim:1 npp:1 npm:0 nKp:0 nKm:1
```

```
DedxPID::particleIDCalculation()::runNo = 56789
DedxPID::particleIDCalculation()::i = 0
DedxPID::particleIDCalculation()::m_chi[i] = -2.52511
DedxPID::particleIDCalculation()::sep = -2.52511
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56789
DedxPID::particleIDCalculation()::i = 1
DedxPID::particleIDCalculation()::m_chi[i] = -3.13853
DedxPID::particleIDCalculation()::sep = -3.13853
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56789
DedxPID::particleIDCalculation()::i = 2
DedxPID::particleIDCalculation()::m_chi[i] = -3.35037
DedxPID::particleIDCalculation()::sep = -3.8628
DedxPID::particleIDCalculation()::m_offsetCorr[i] = -0.50047
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1.00357
DedxPID::particleIDCalculation()::runNo = 56789
DedxPID::particleIDCalculation()::i = 3
DedxPID::particleIDCalculation()::m_chi[i] = -5.64472
DedxPID::particleIDCalculation()::sep = -5.64472
DedxPID::particleIDCalculation()::m_offsetCorr[i] = 0
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
DedxPID::particleIDCalculation()::runNo = 56789
DedxPID::particleIDCalculation()::i = 4
DedxPID::particleIDCalculation()::m_chi[i] = -1.72333
DedxPID::particleIDCalculation()::sep = -5.83393
DedxPID::particleIDCalculation()::m_offsetCorr[i] = -4.11059
DedxPID::particleIDCalculation()::m_sigmaCorr[i] = 1
pp
npip:1 npim:2 npp:1 npm:0 nKp:0 nKm:0
```