

Study of a good track selection

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Generation

- ◆ Pythia 8; (p+p) at 27 GeV; Soft QCD (wo elastic);
- ◆ SPDRoot from 1/02/2023;
- ◆ ITS: — MAPS 4 layers, no EndCap;

- ◆ Beam:

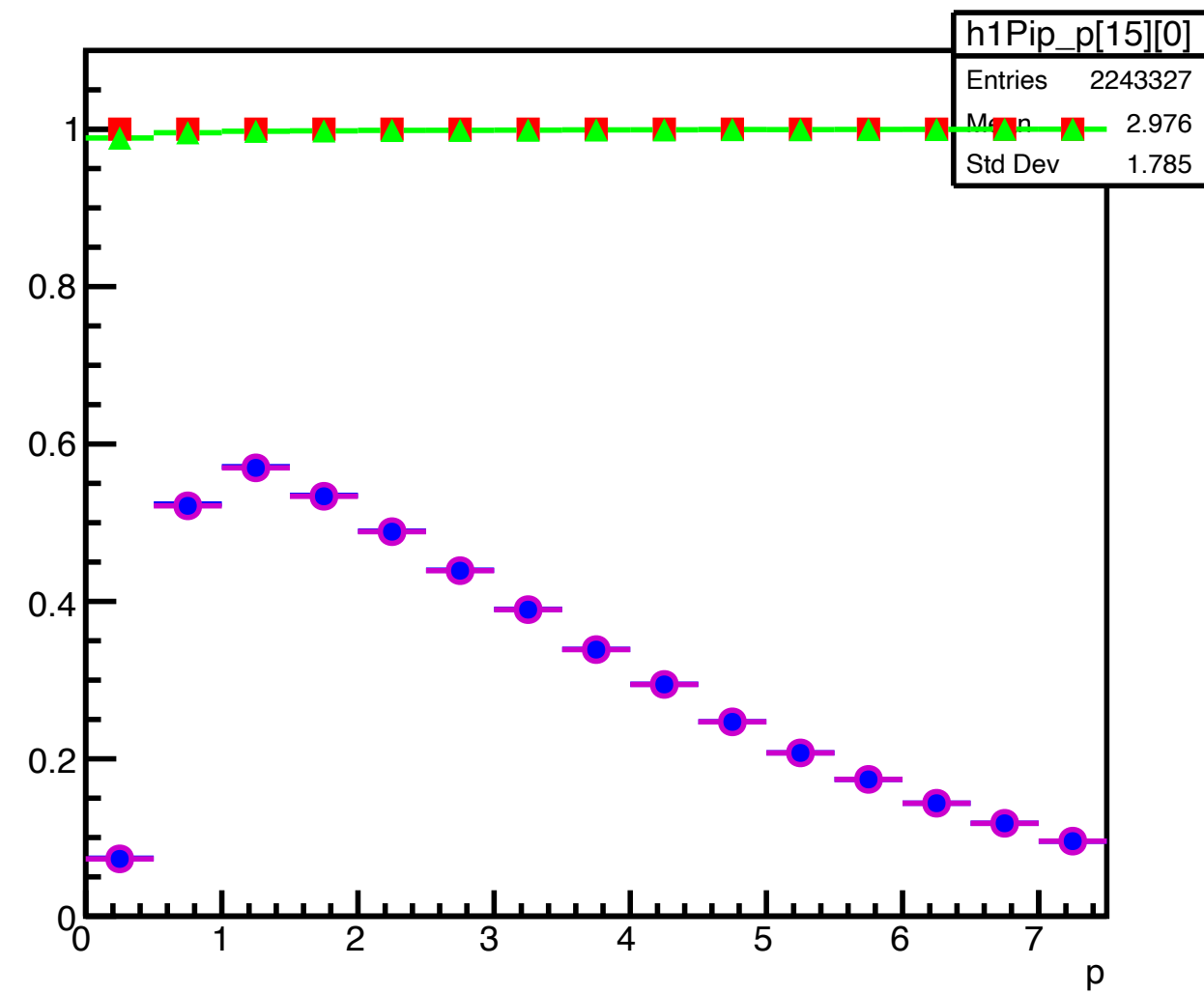
```
primGen->SetBeam(0., 0., 0.025, 0.025); //X0,Y0,Xwidth,Ywidth : 250 microns std. dev.  
primGen->SmearGausVertexXY(kTRUE);  
//Important : for uniform smearing or SmearVertexXY(kTRUE), give twice the width you want  
//uniform smearing is done from -width/2 to width/2  
//for Gaussian smearing or SmearGausVertexXY(kTRUE), give sigma or standard deviation you want  
  
primGen->SetTarget(0., 30.); //Z0,Zwidth, 30 cm std. dev.  
primGen->SmearGausVertexZ(kTRUE);  
//Important : for uniform smearing or SmearVertexZ(kTRUE), give twice the width you want  
//uniform smearing is done from -width/2 to width/2  
//for Gaussian smearing or SmearGausVertexZ(kTRUE), give sigma or standard deviation you want
```


Selection

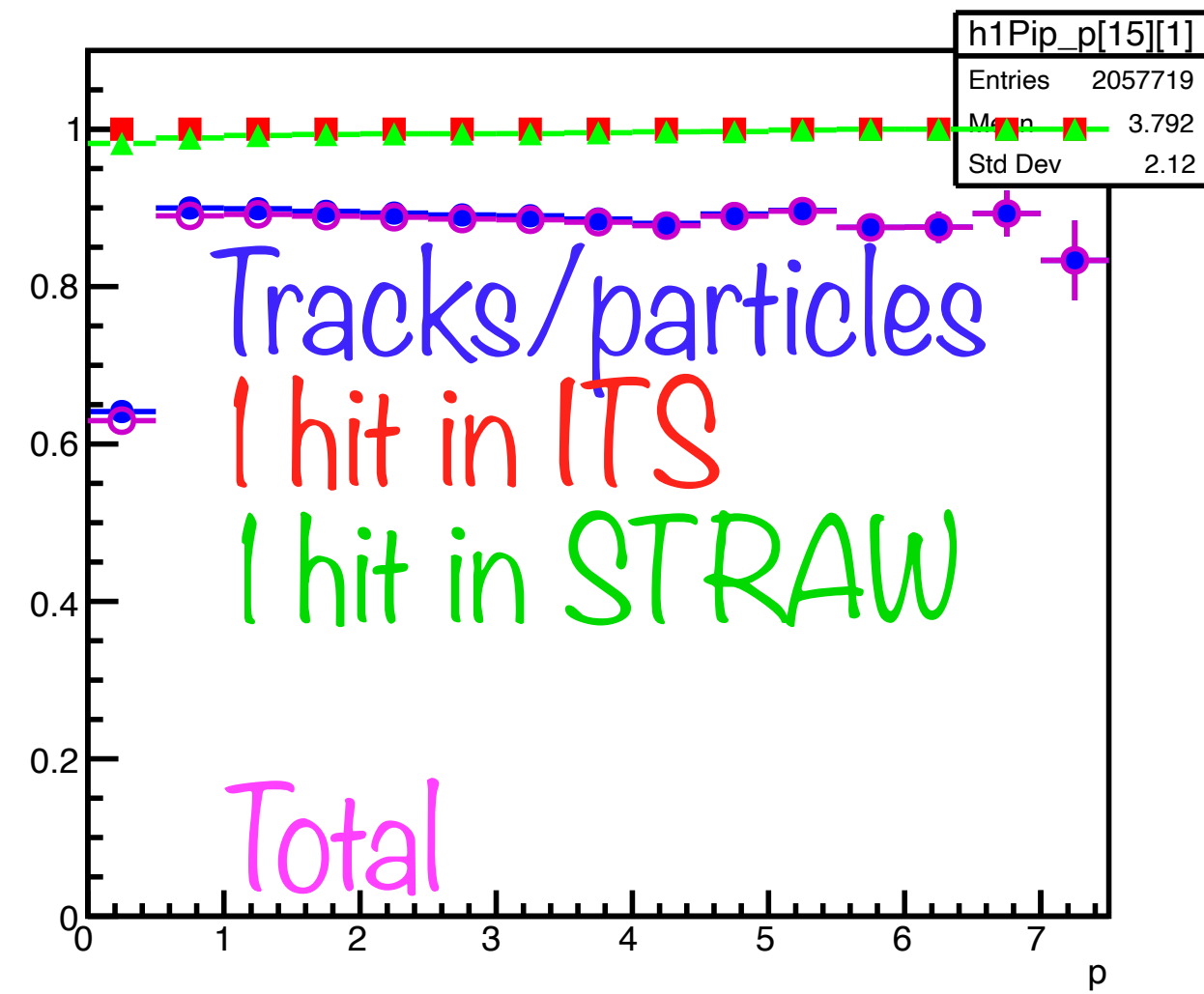
- ◆ Generated (true) Primary Vertex: $-35 \text{ cm} > Z_{PV} < 35 \text{ cm}$
- ◆ MC tracks associated with the PV
- ◆ The tracks have at least 1 hit in ITS
- ◆ The tracks have at least 1 hit in STRAW

Positive pions

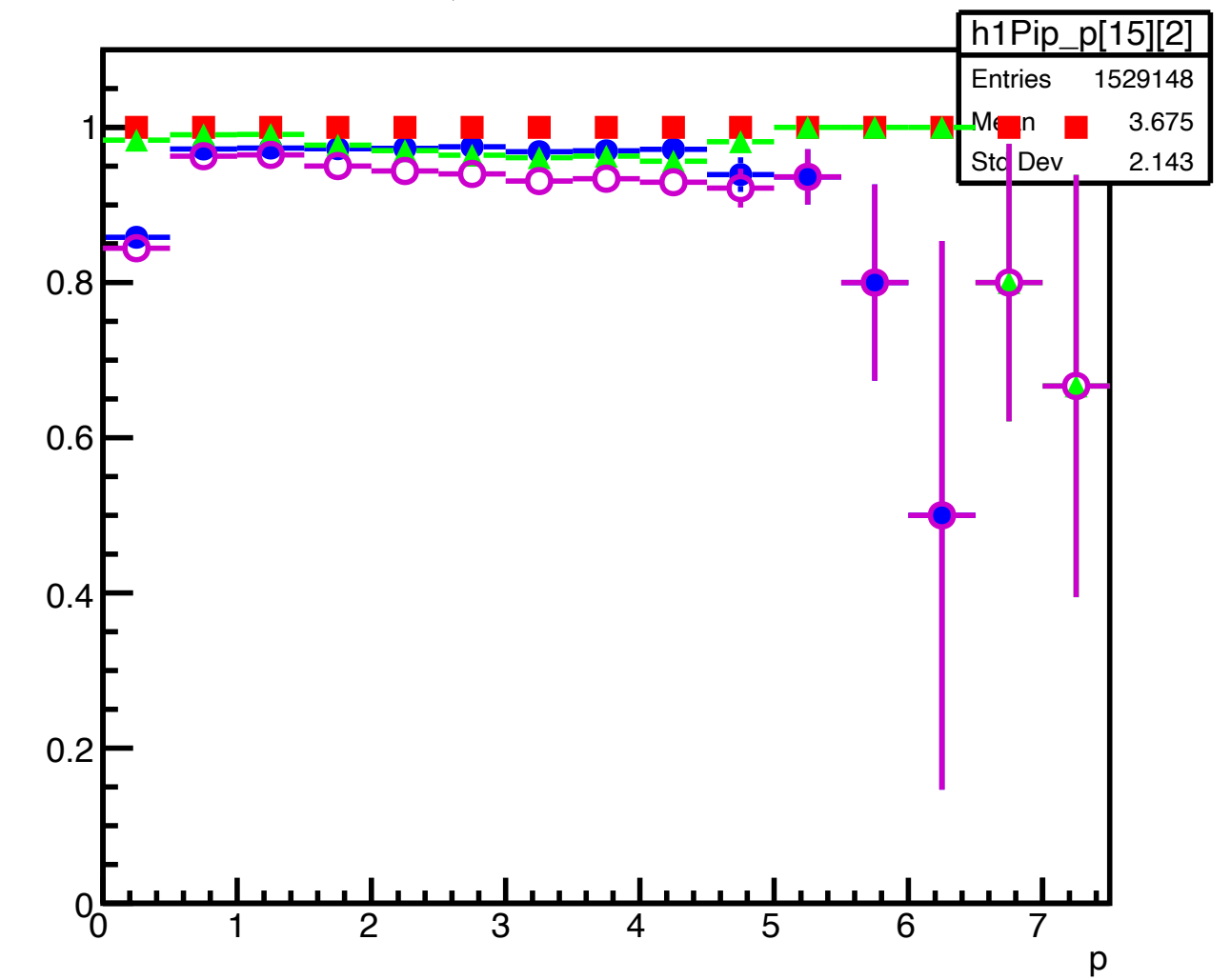
$0.000 < \theta < 0.262$



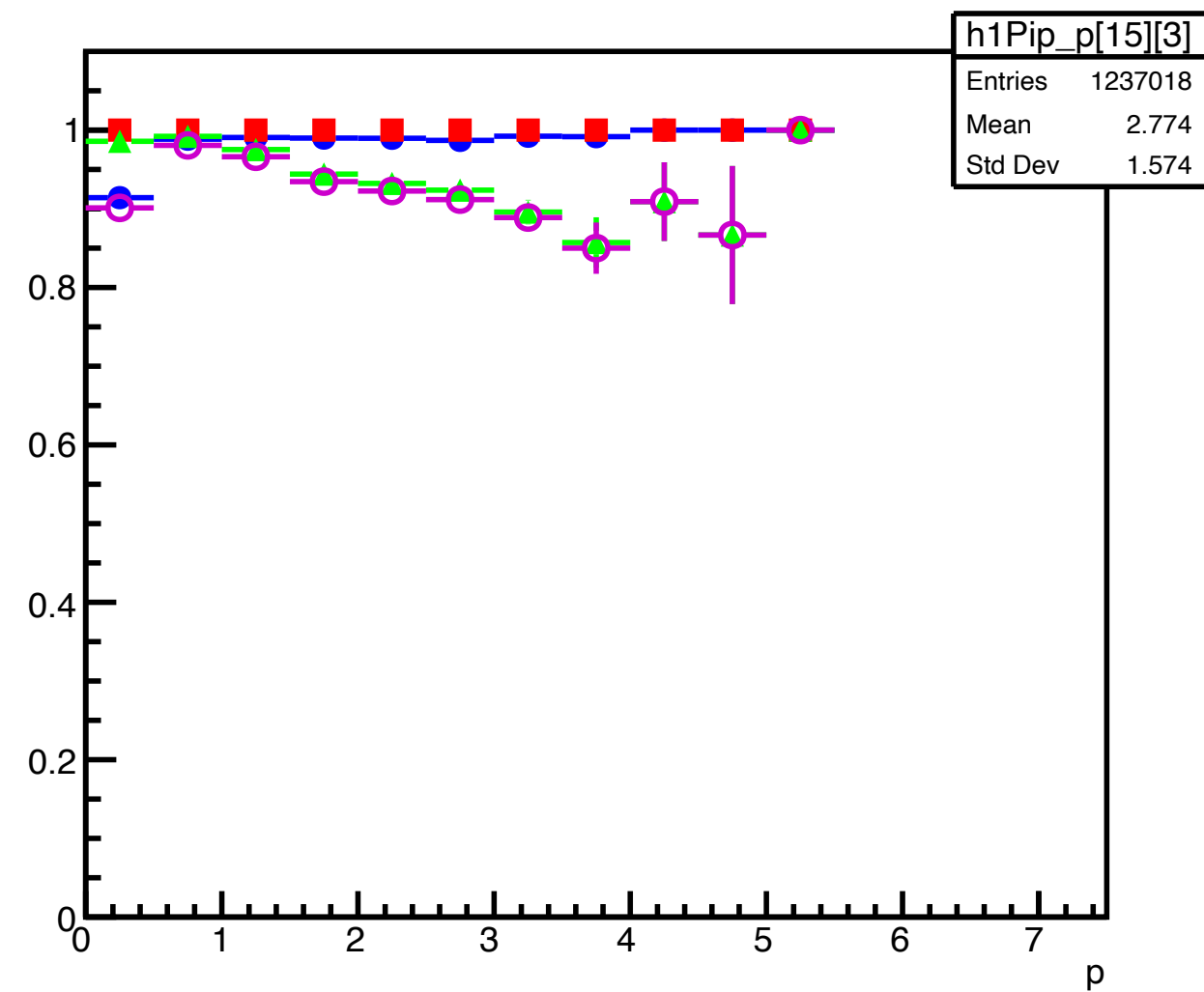
$0.262 < \theta < 0.524$



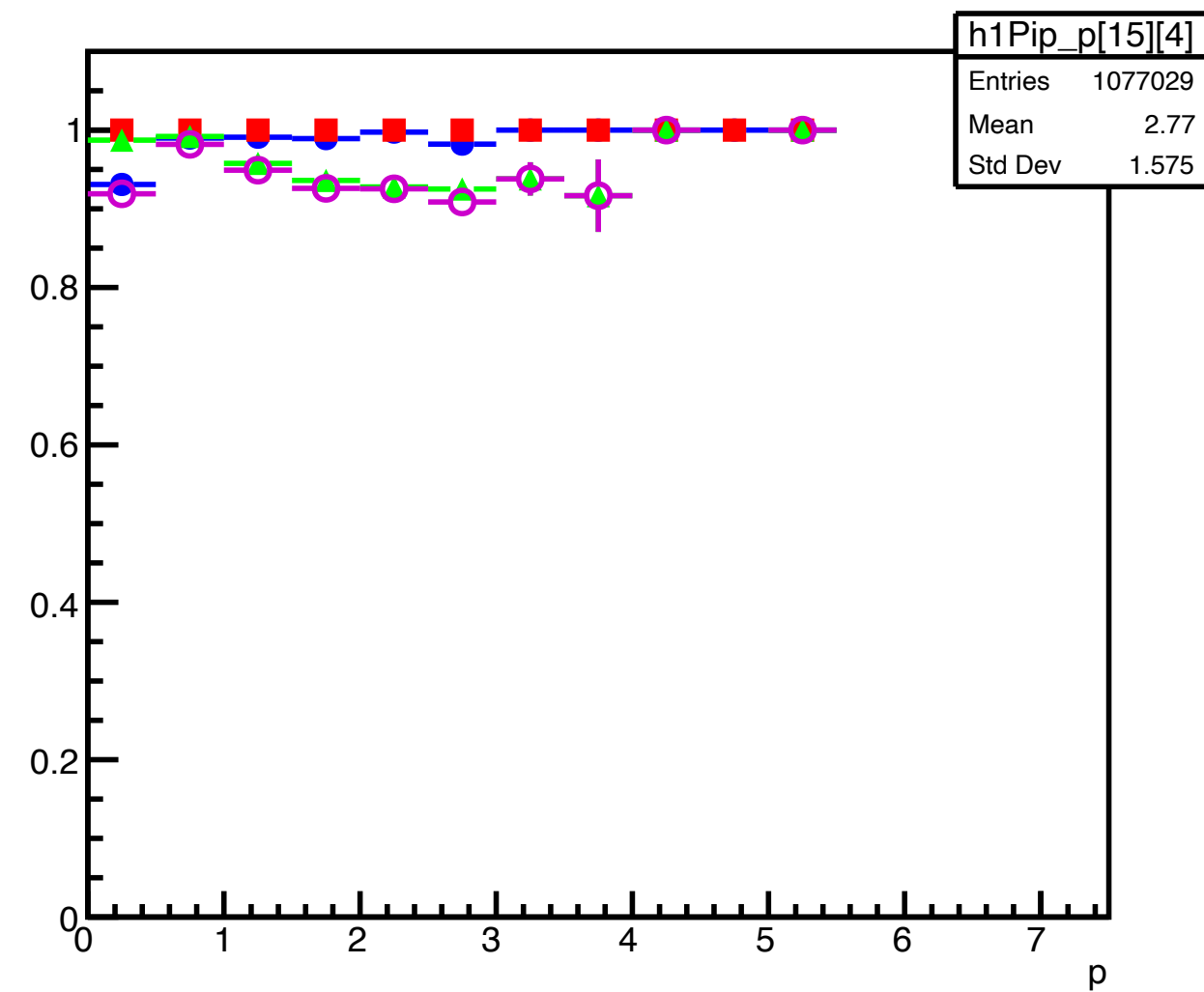
$0.524 < \theta < 0.785$



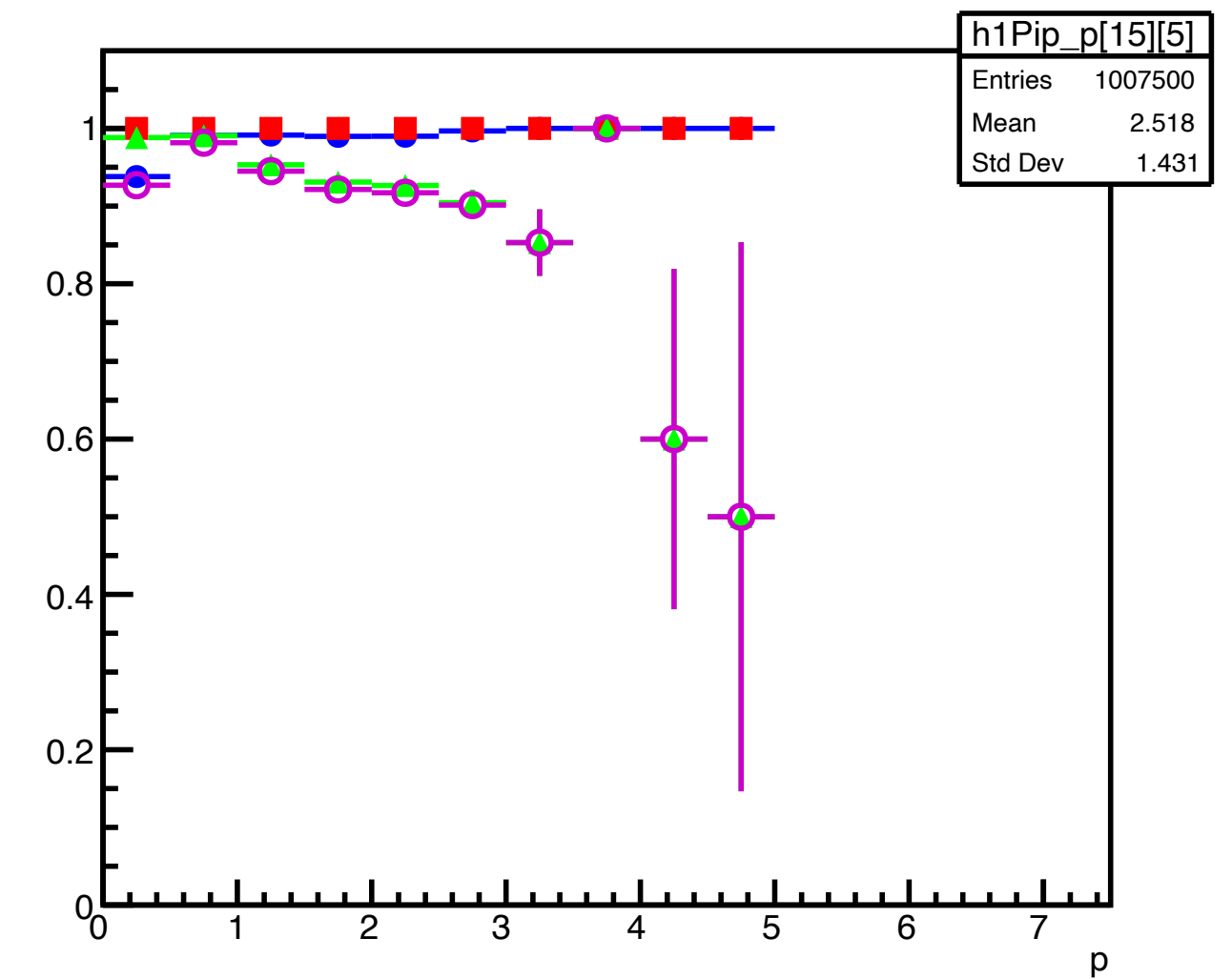
$0.785 < \theta < 1.047$



$1.047 < \theta < 1.309$

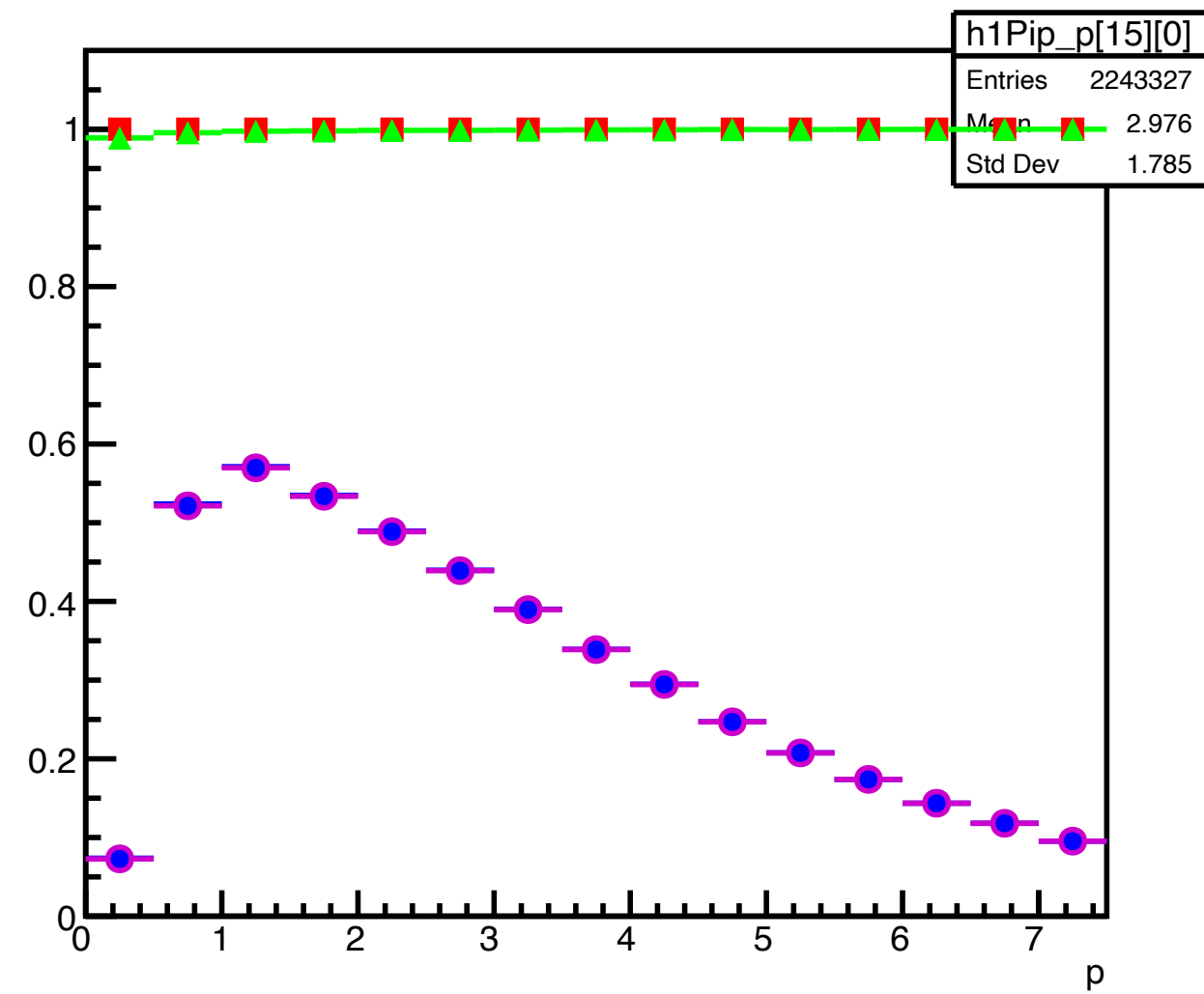


$1.309 < \theta < 1.571$

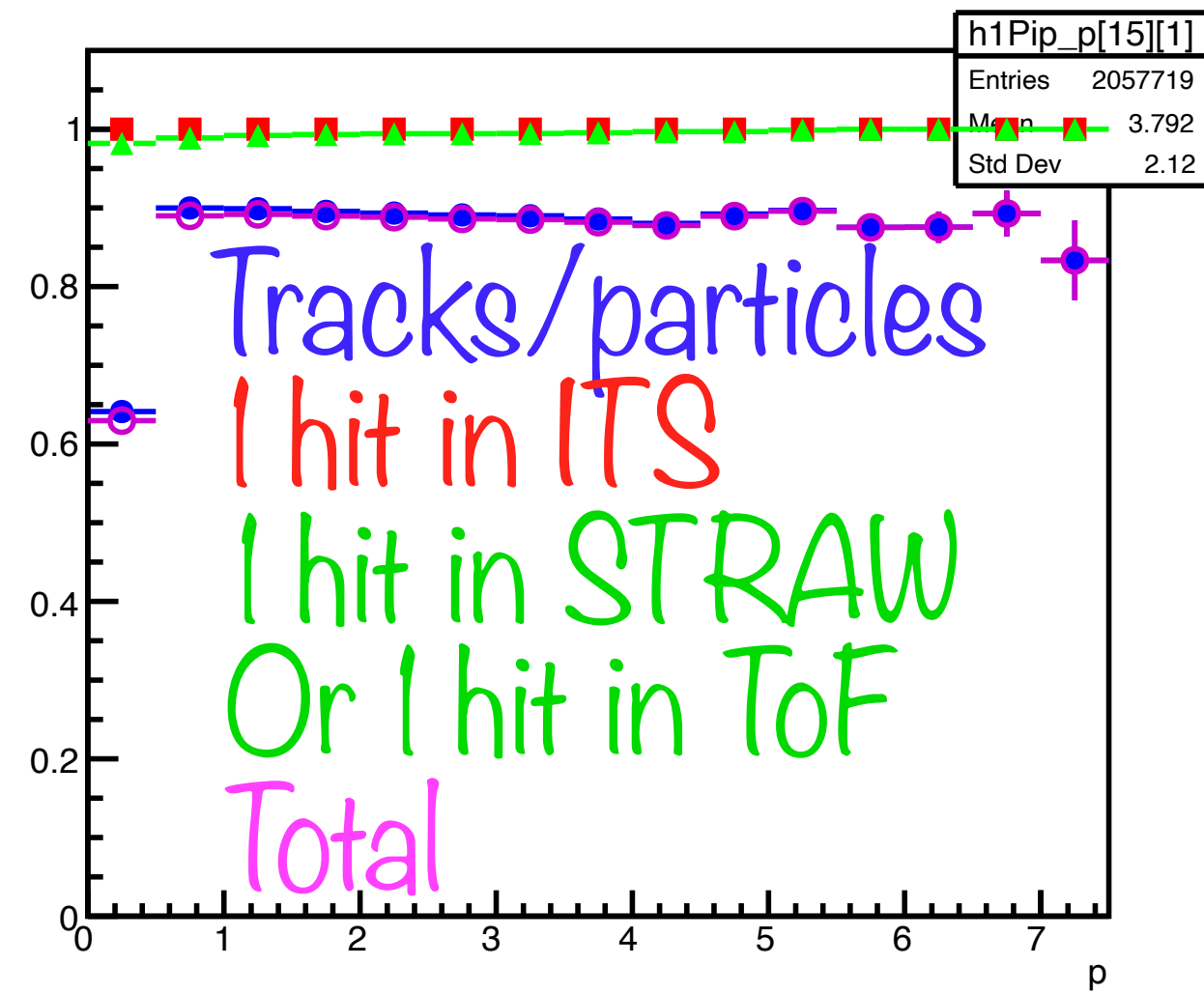


Positive pions

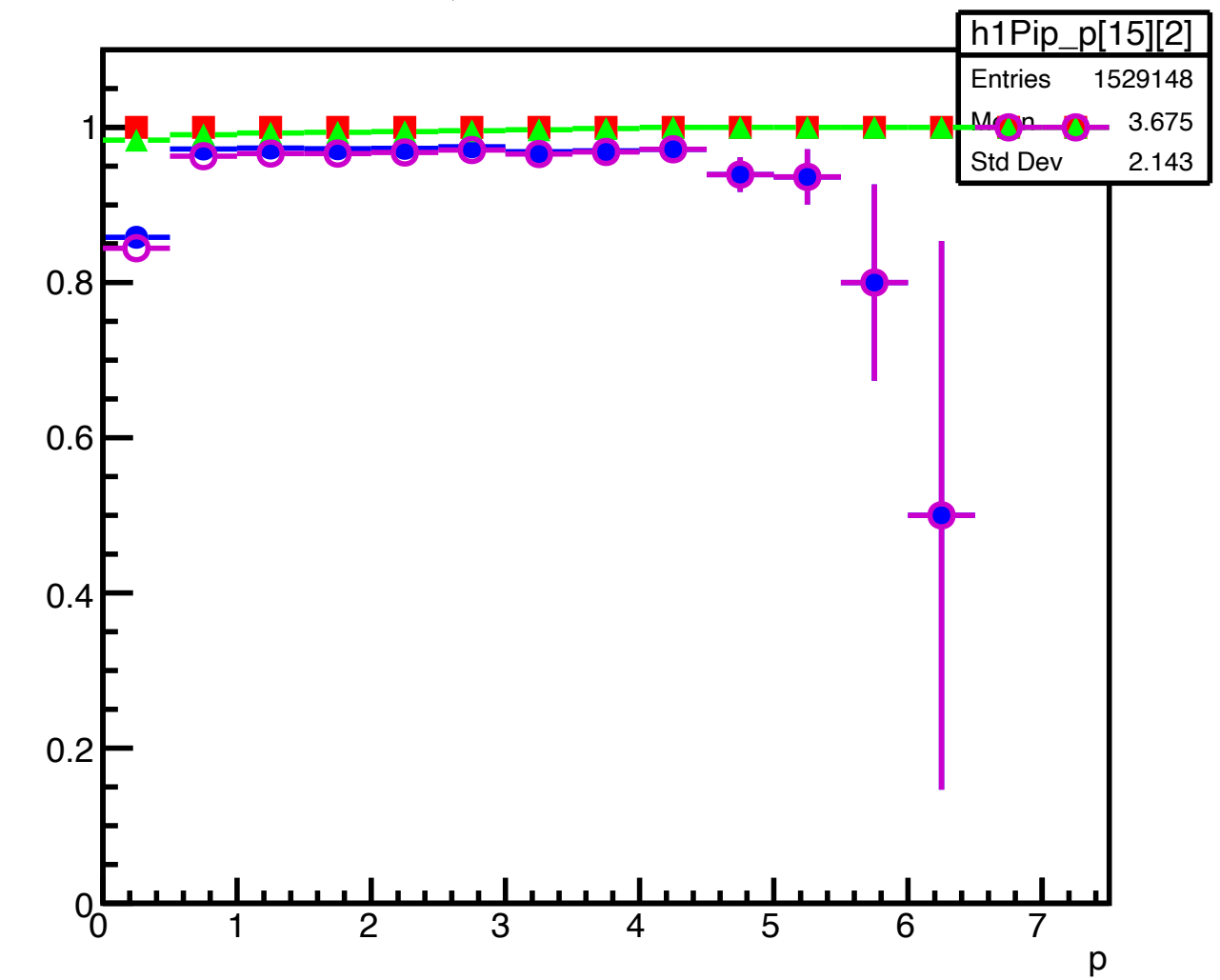
$0.000 < \theta < 0.262$



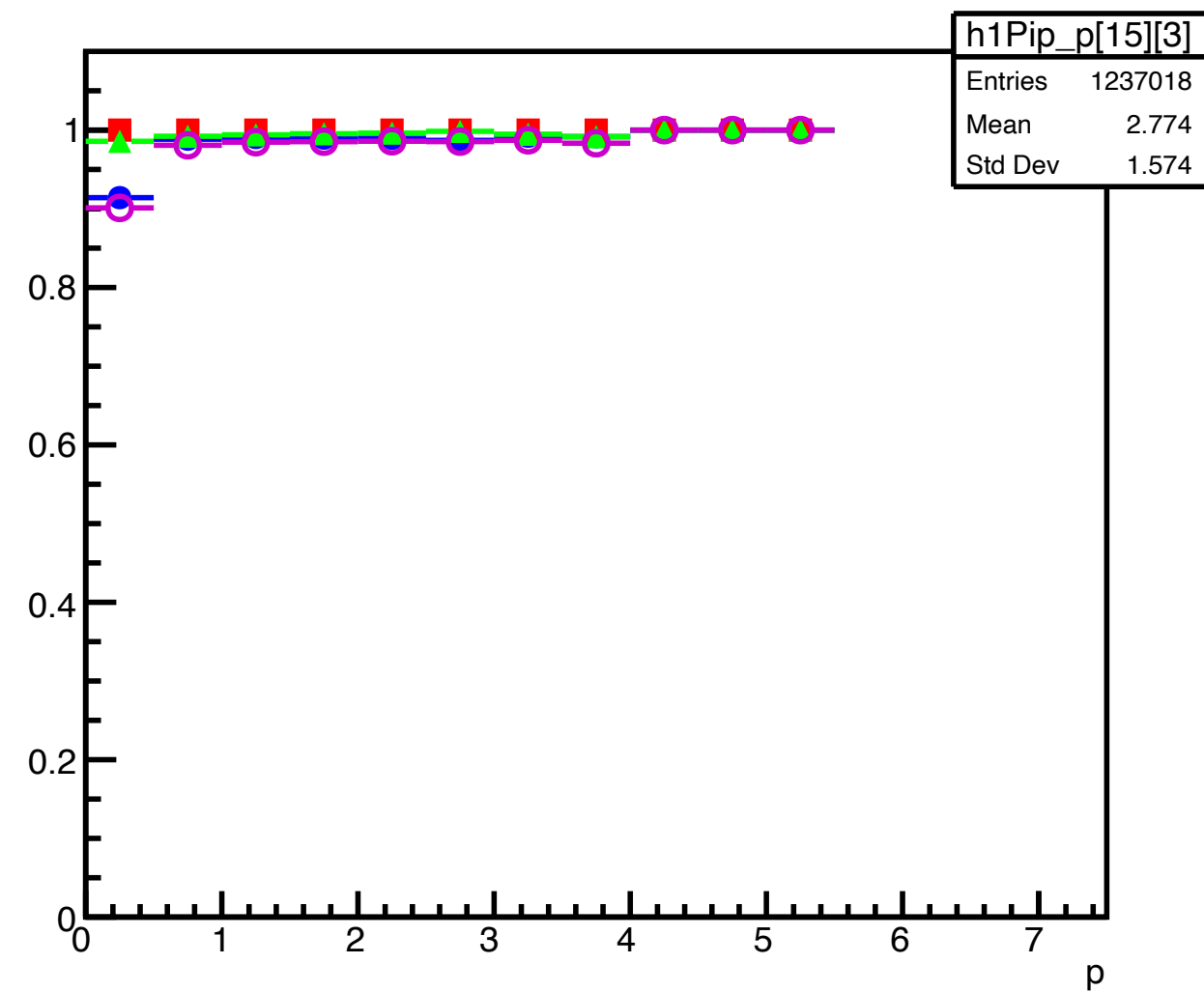
$0.262 < \theta < 0.524$



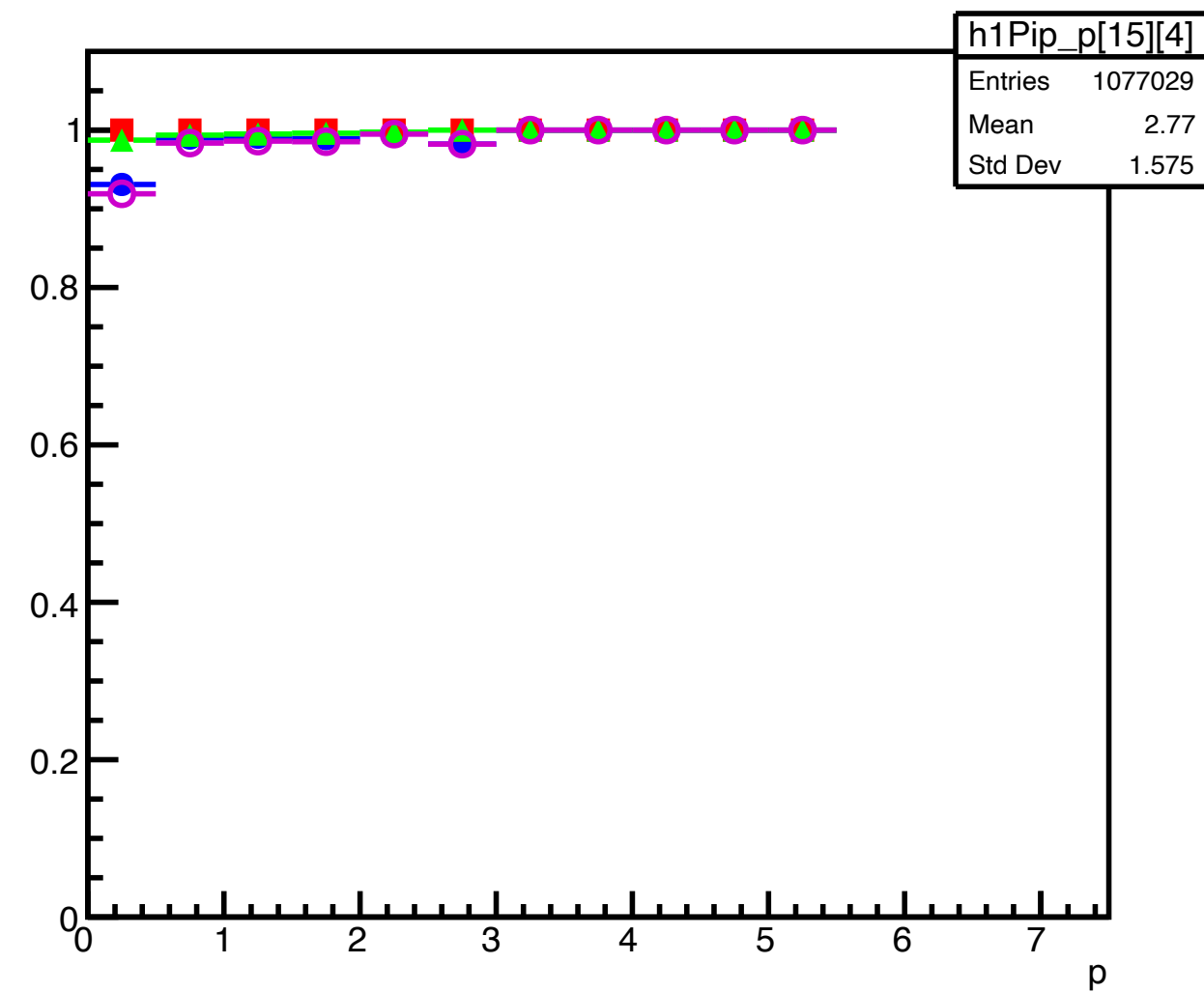
$0.524 < \theta < 0.785$



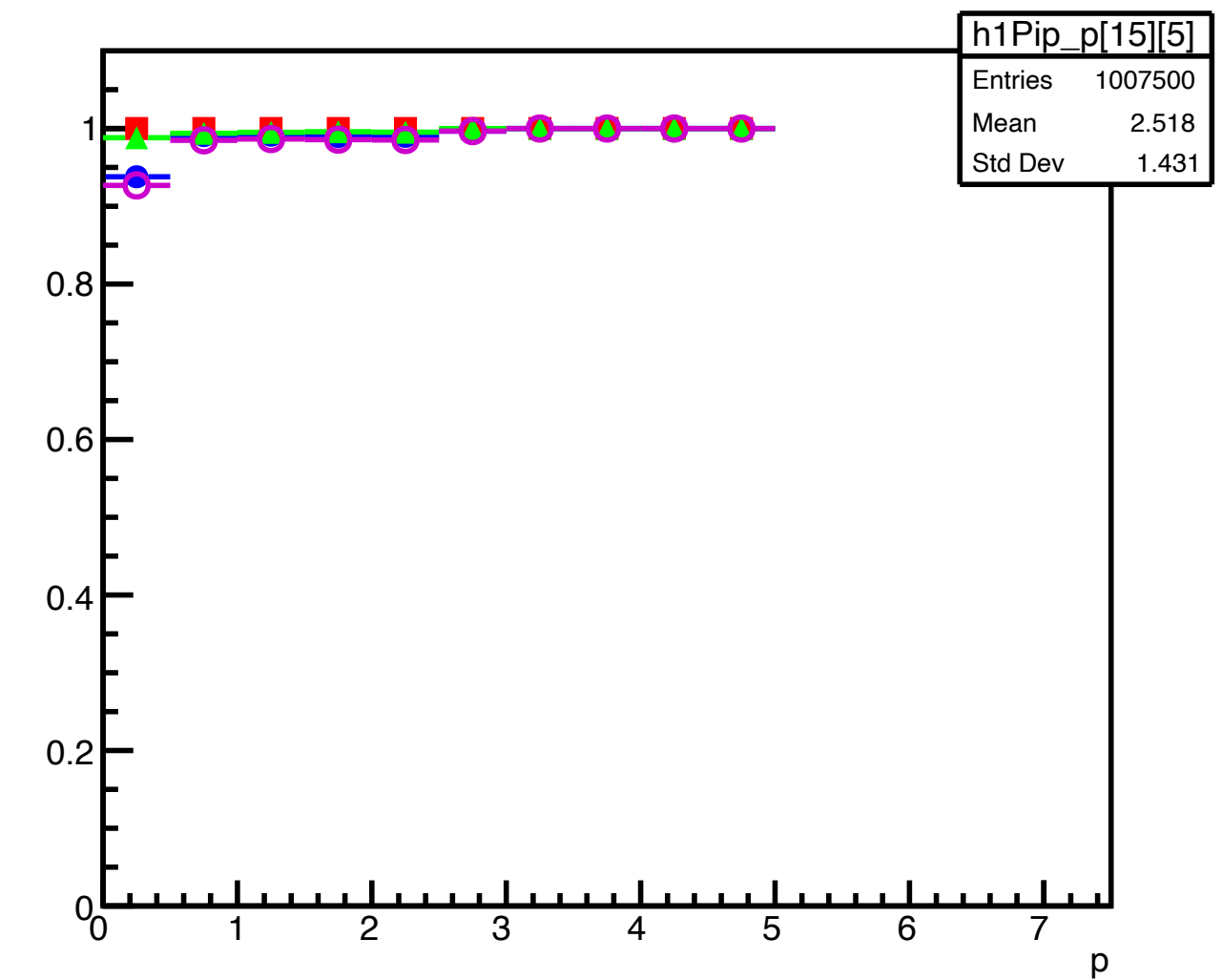
$0.785 < \theta < 1.047$



$1.047 < \theta < 1.309$

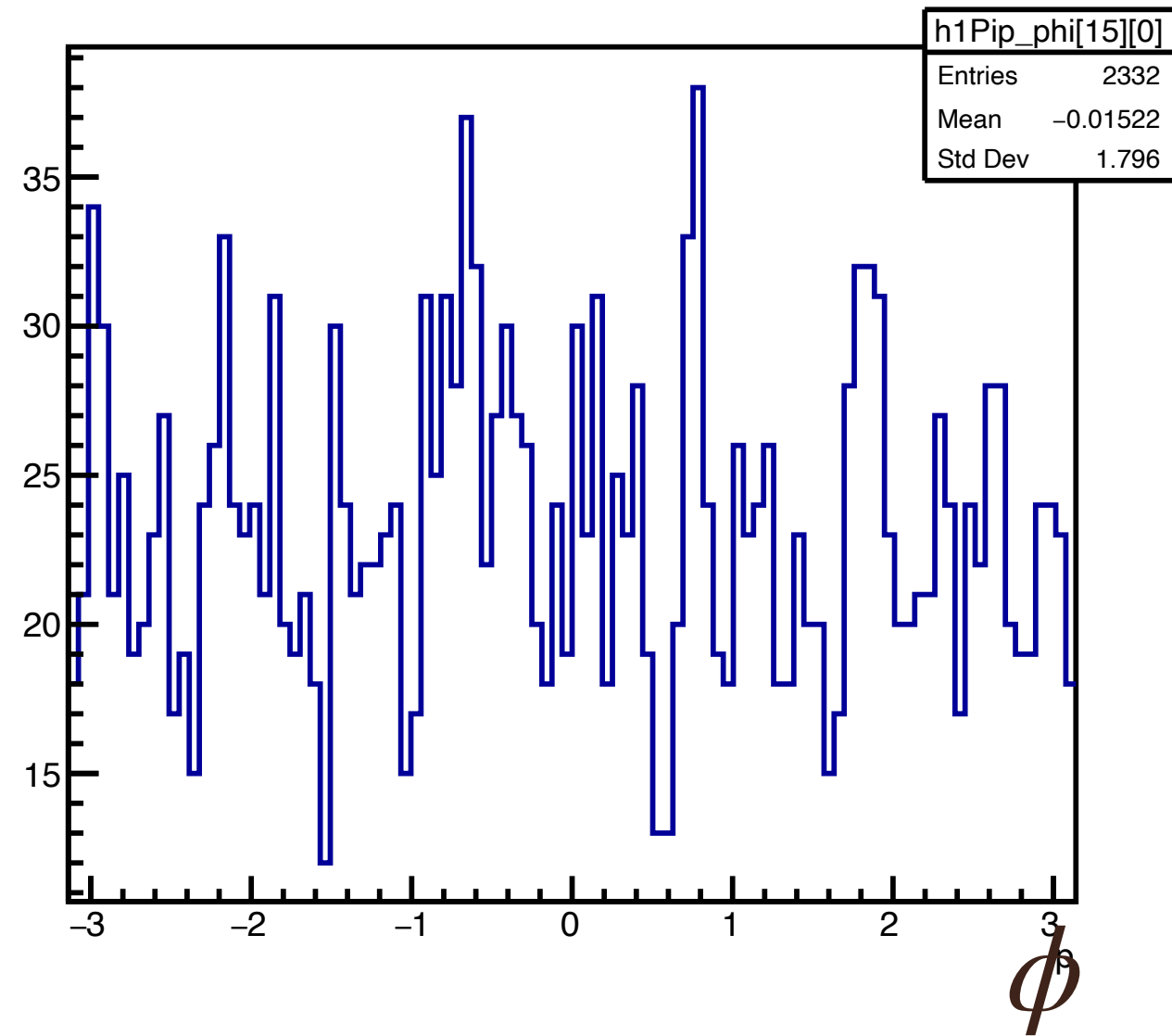


$1.309 < \theta < 1.571$

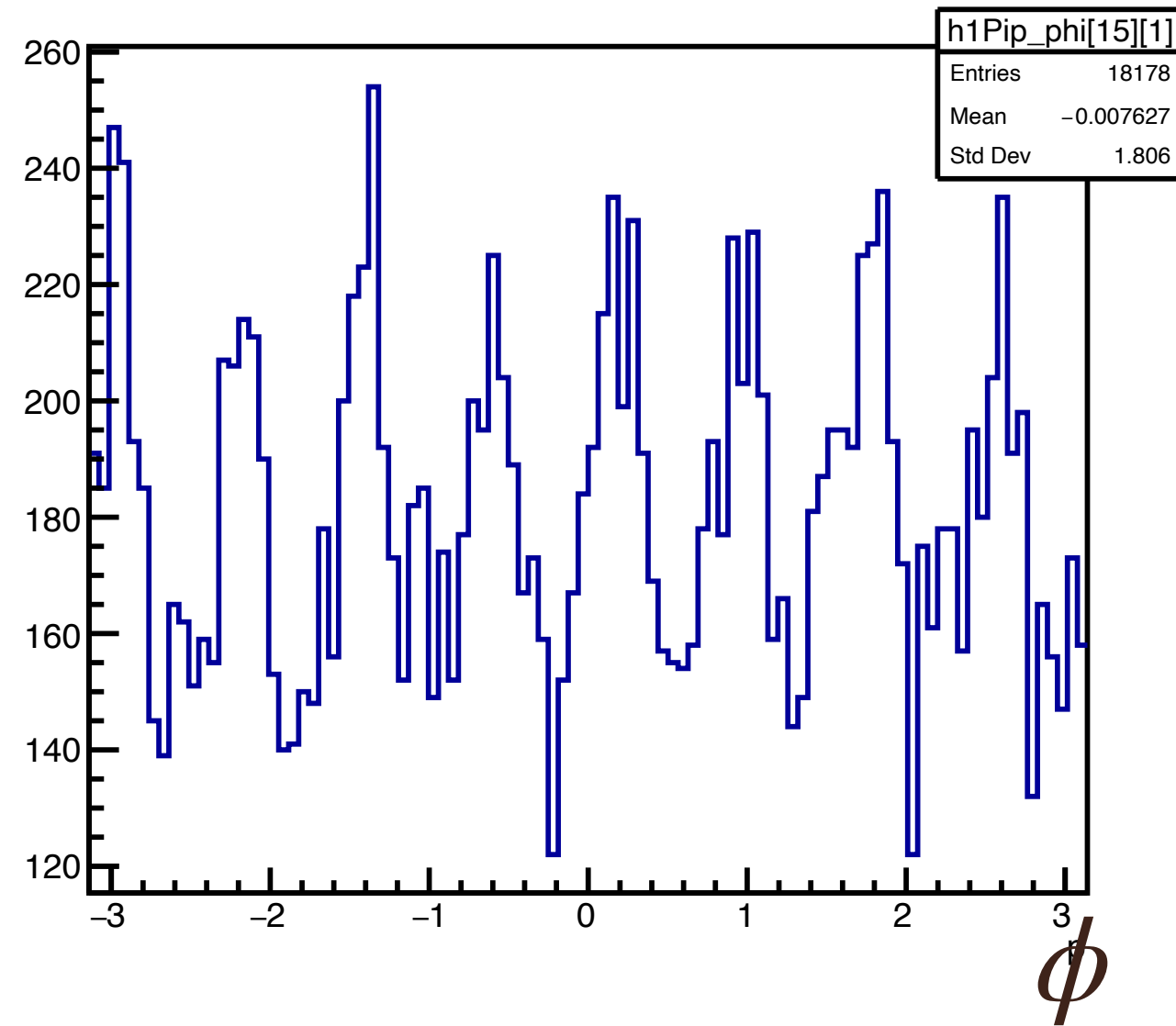


Positive pions: no hits in STRAW but 1 hit in ToF

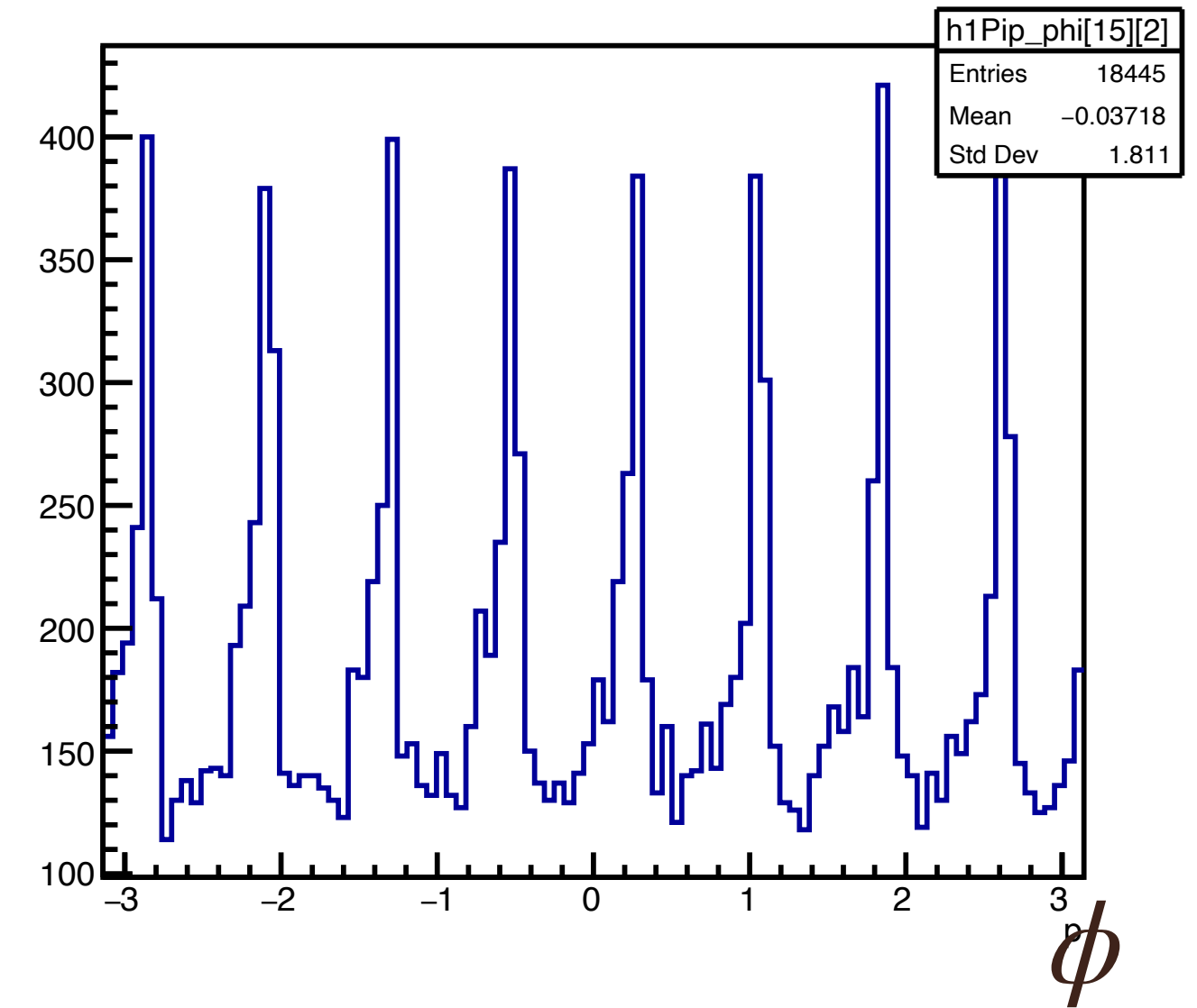
$0.000 < \theta < 0.262$



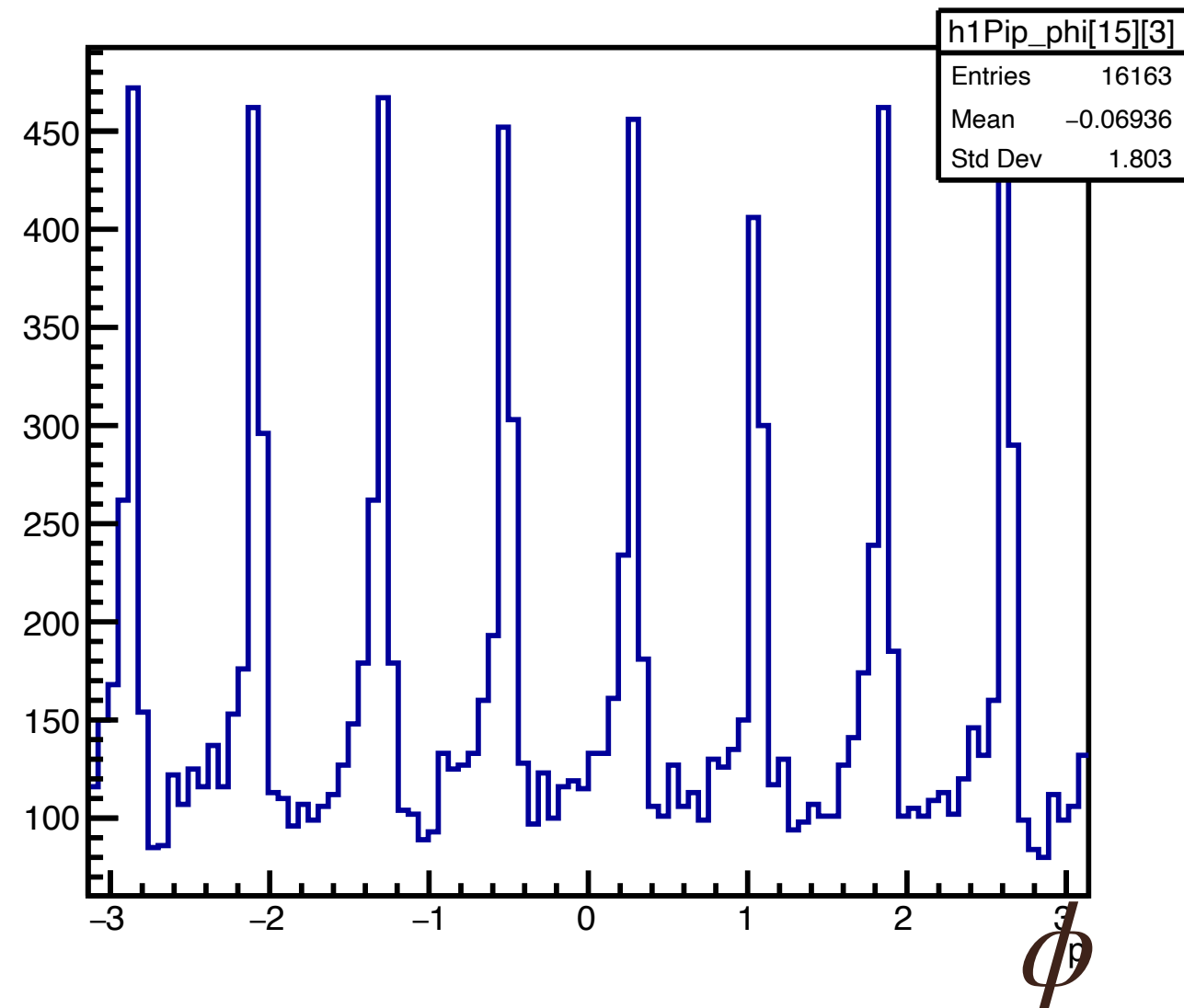
$0.262 < \theta < 0.524$



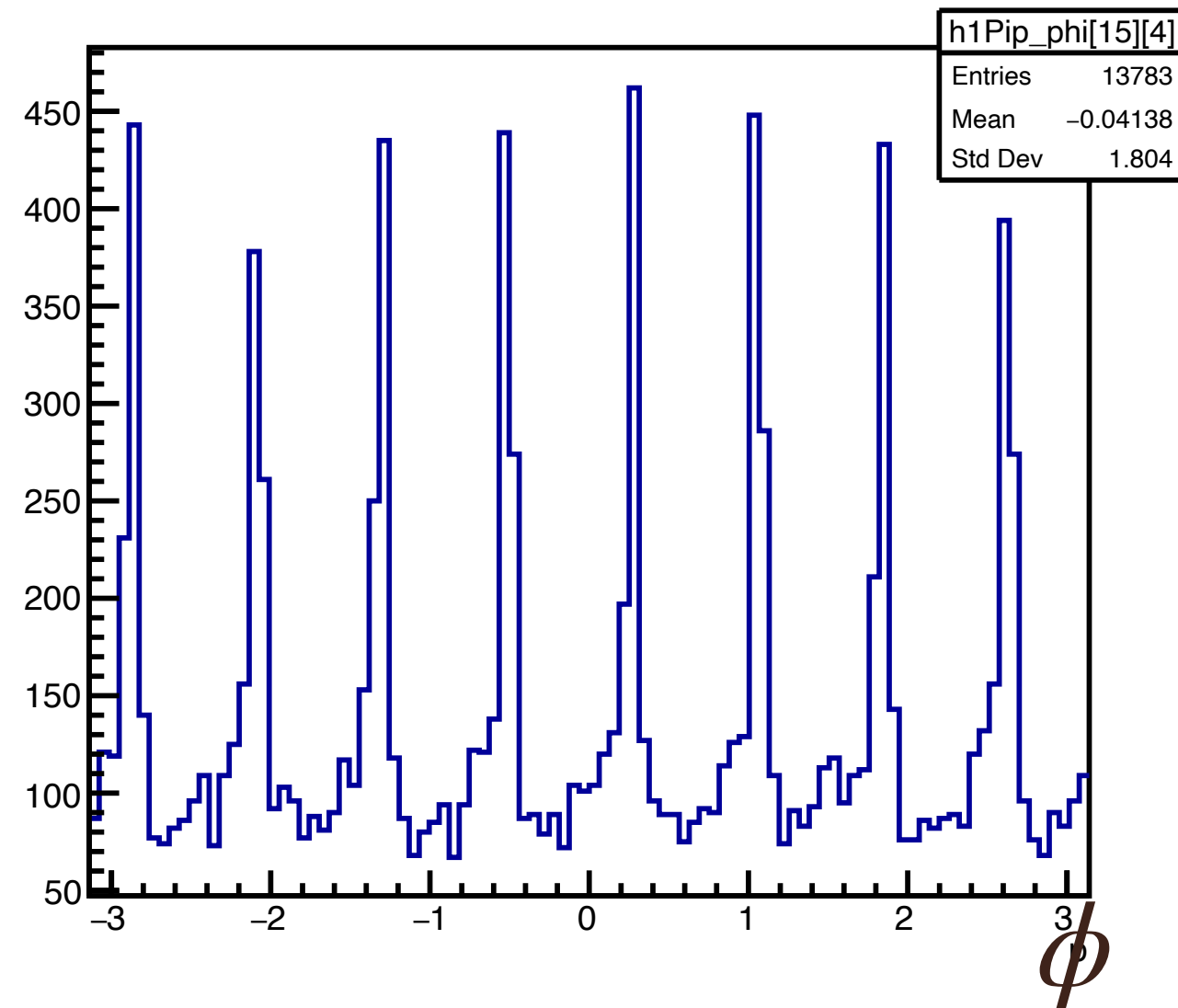
$0.524 < \theta < 0.785$



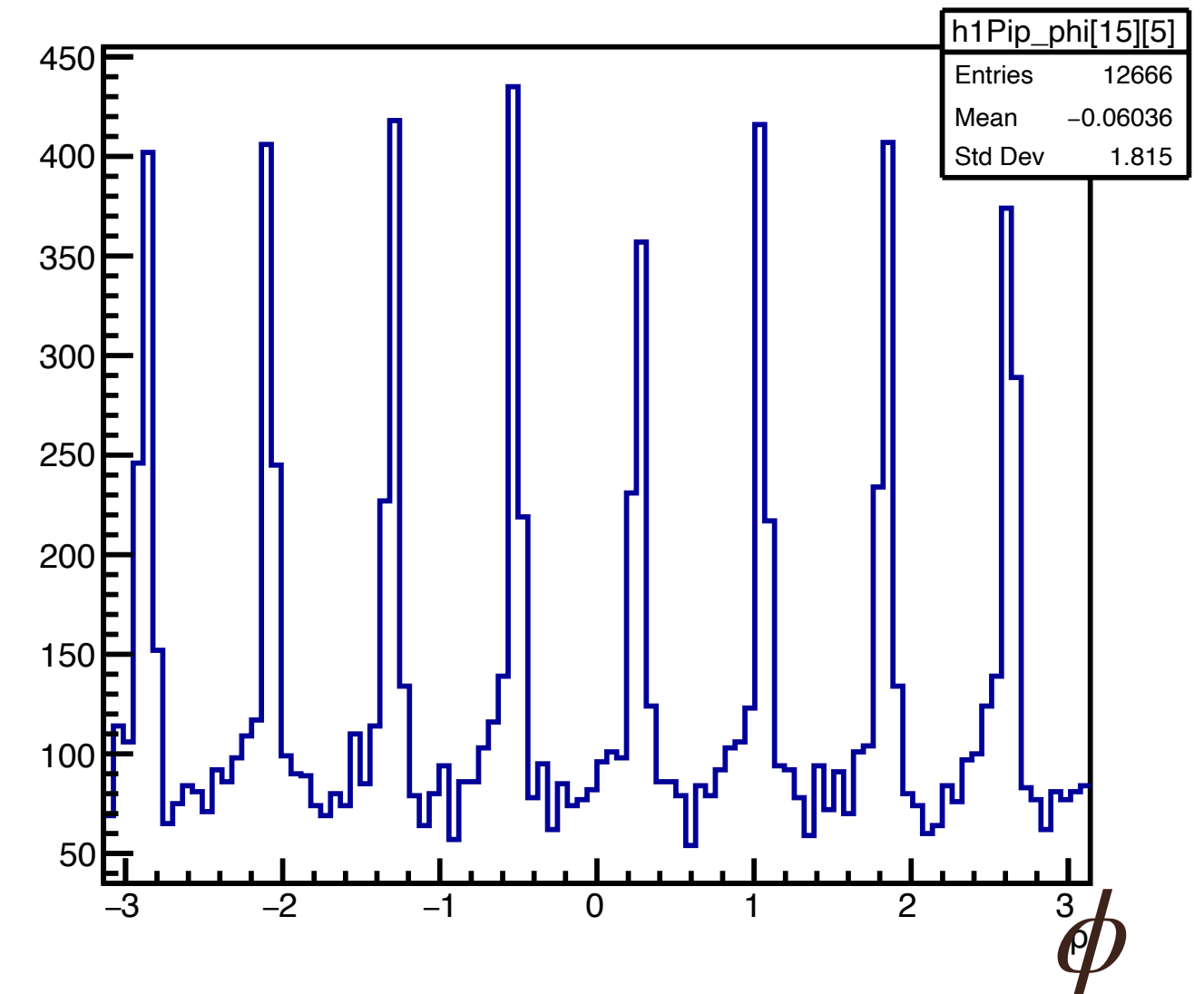
$0.785 < \theta < 1.047$



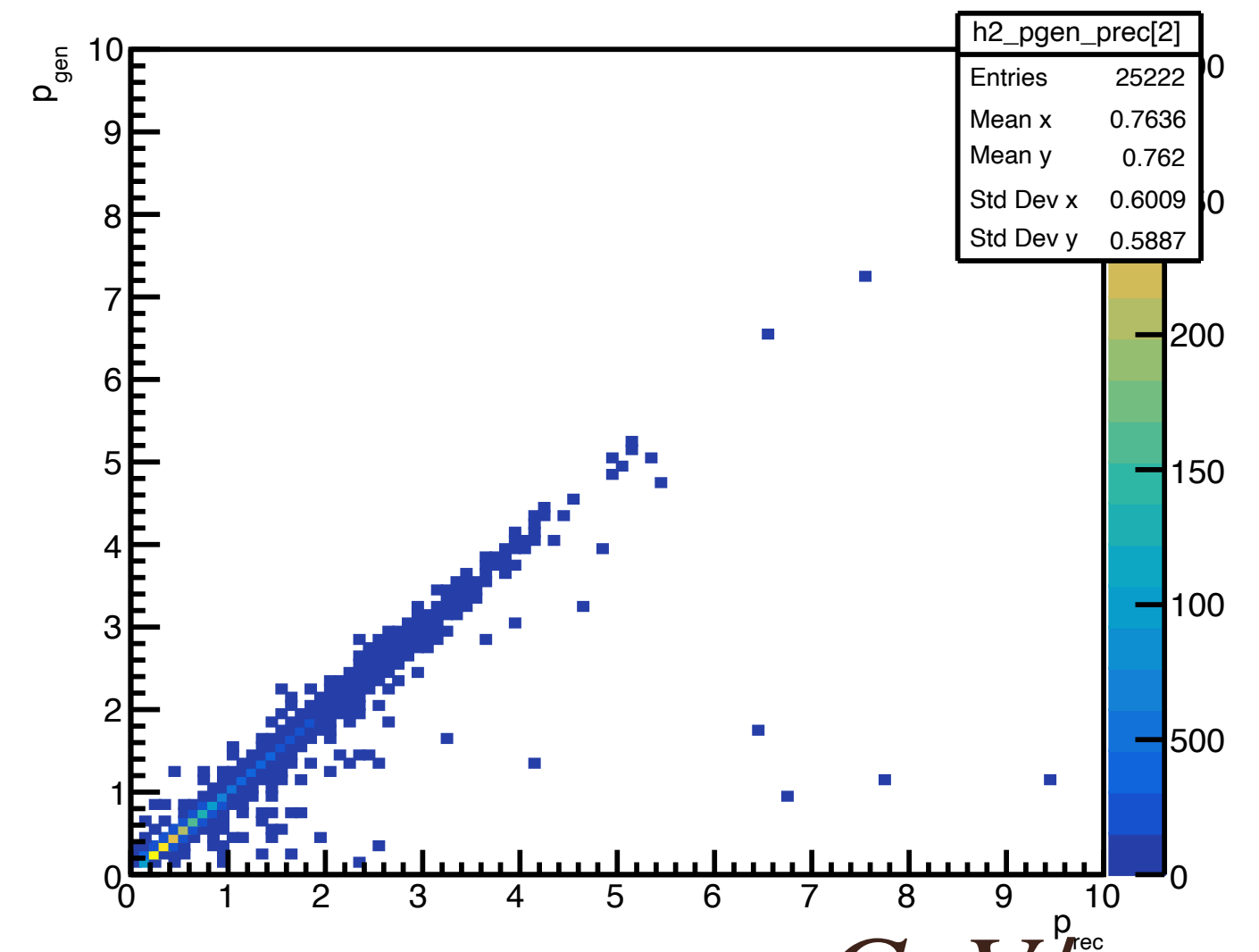
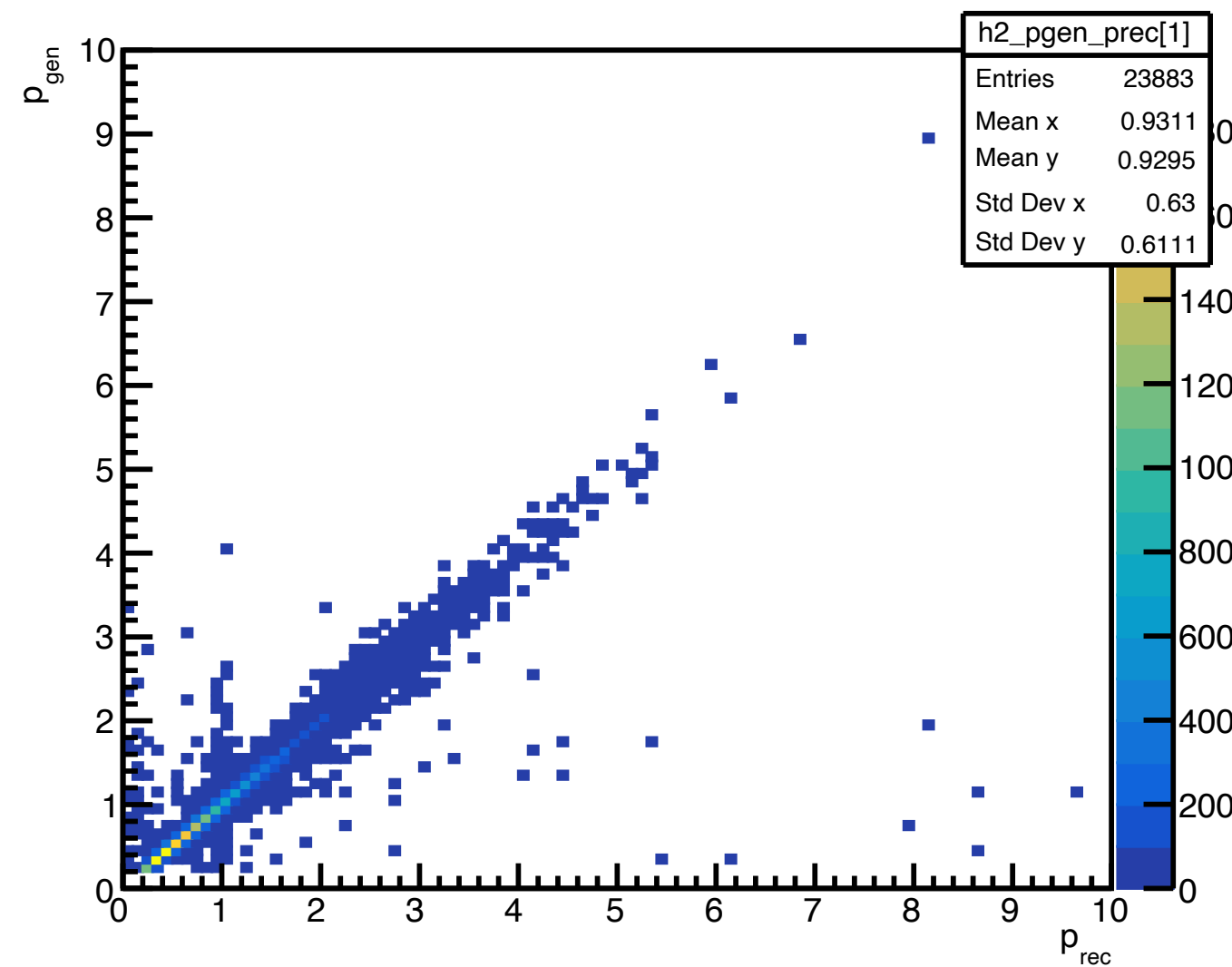
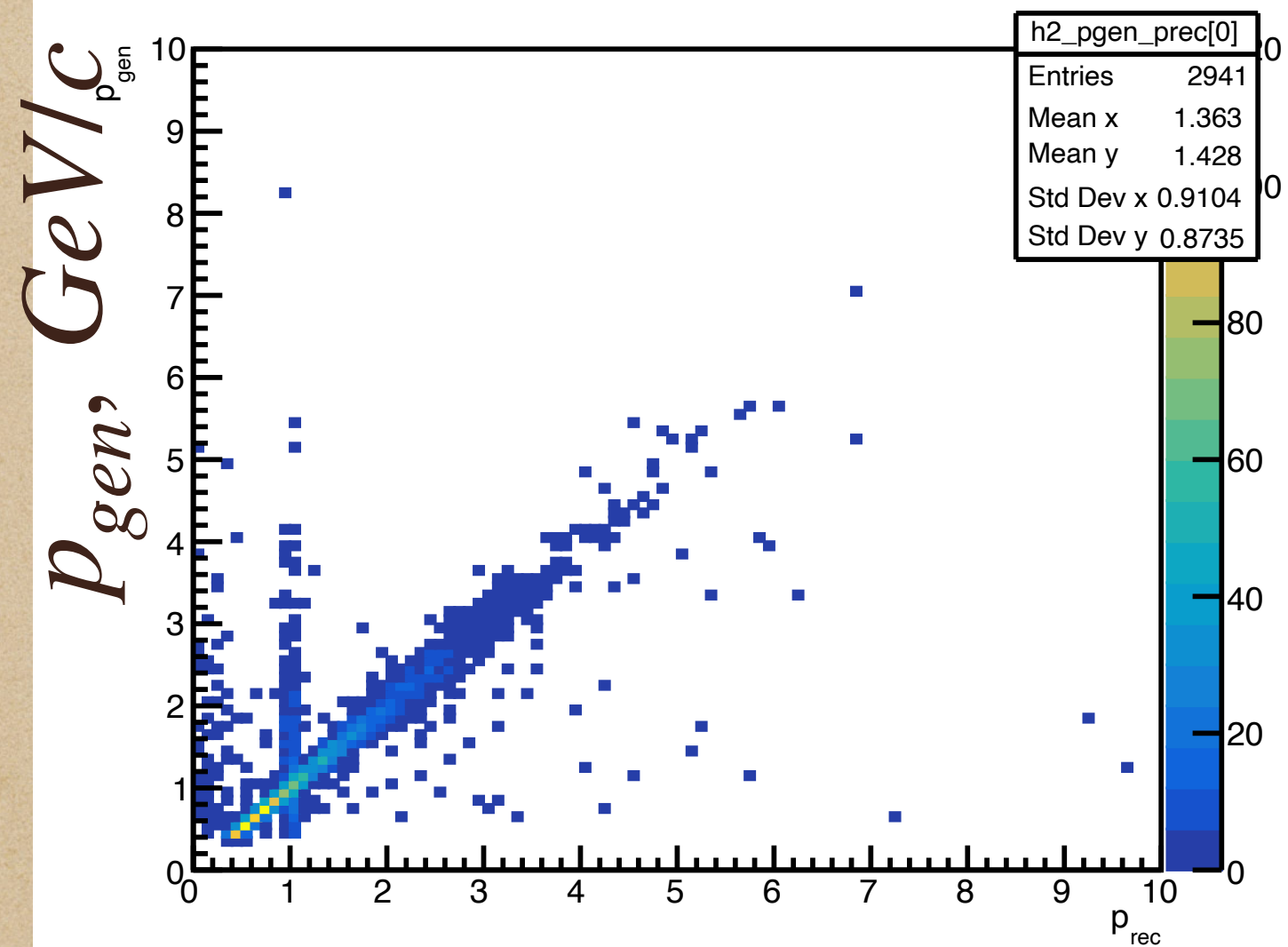
$1.047 < \theta < 1.309$



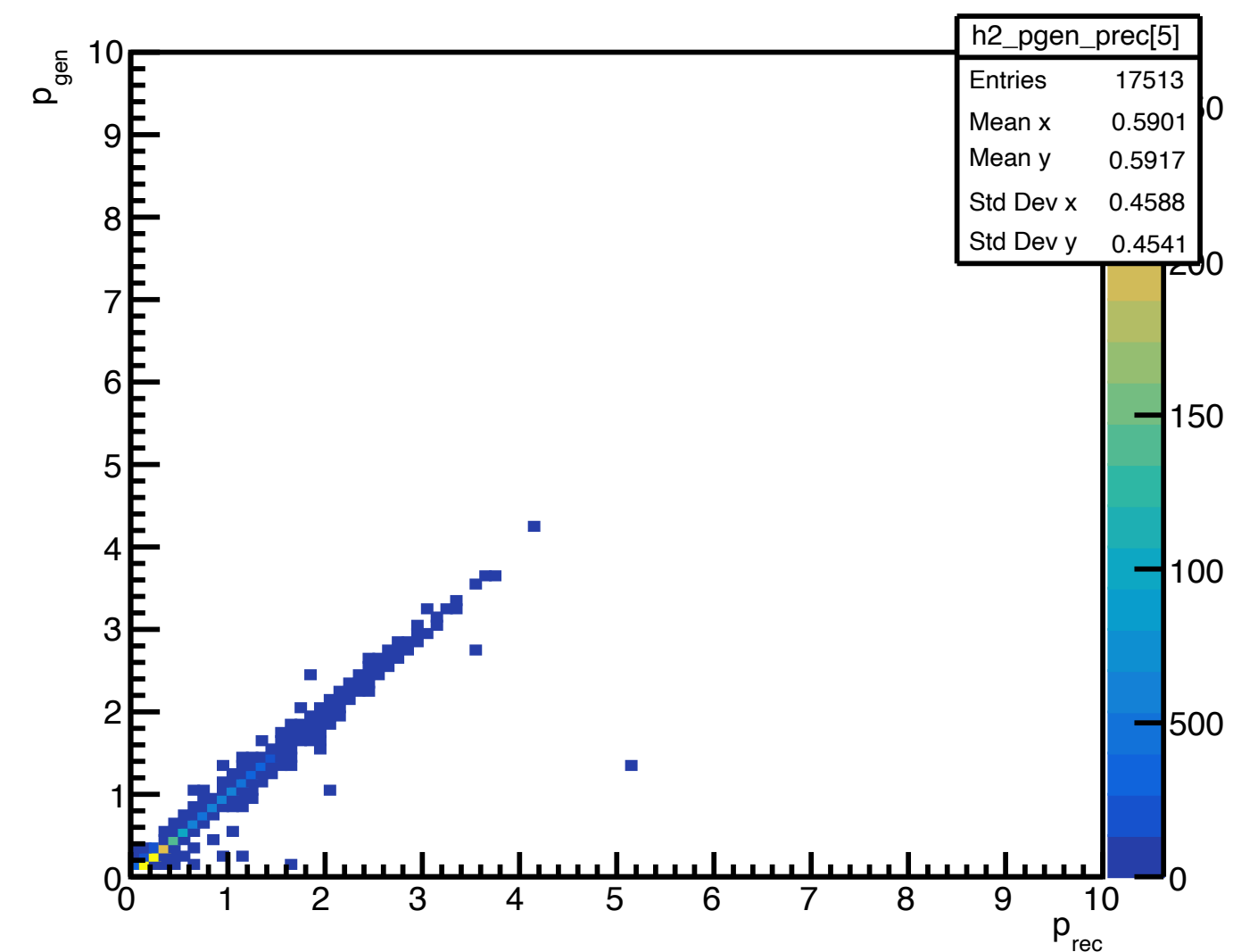
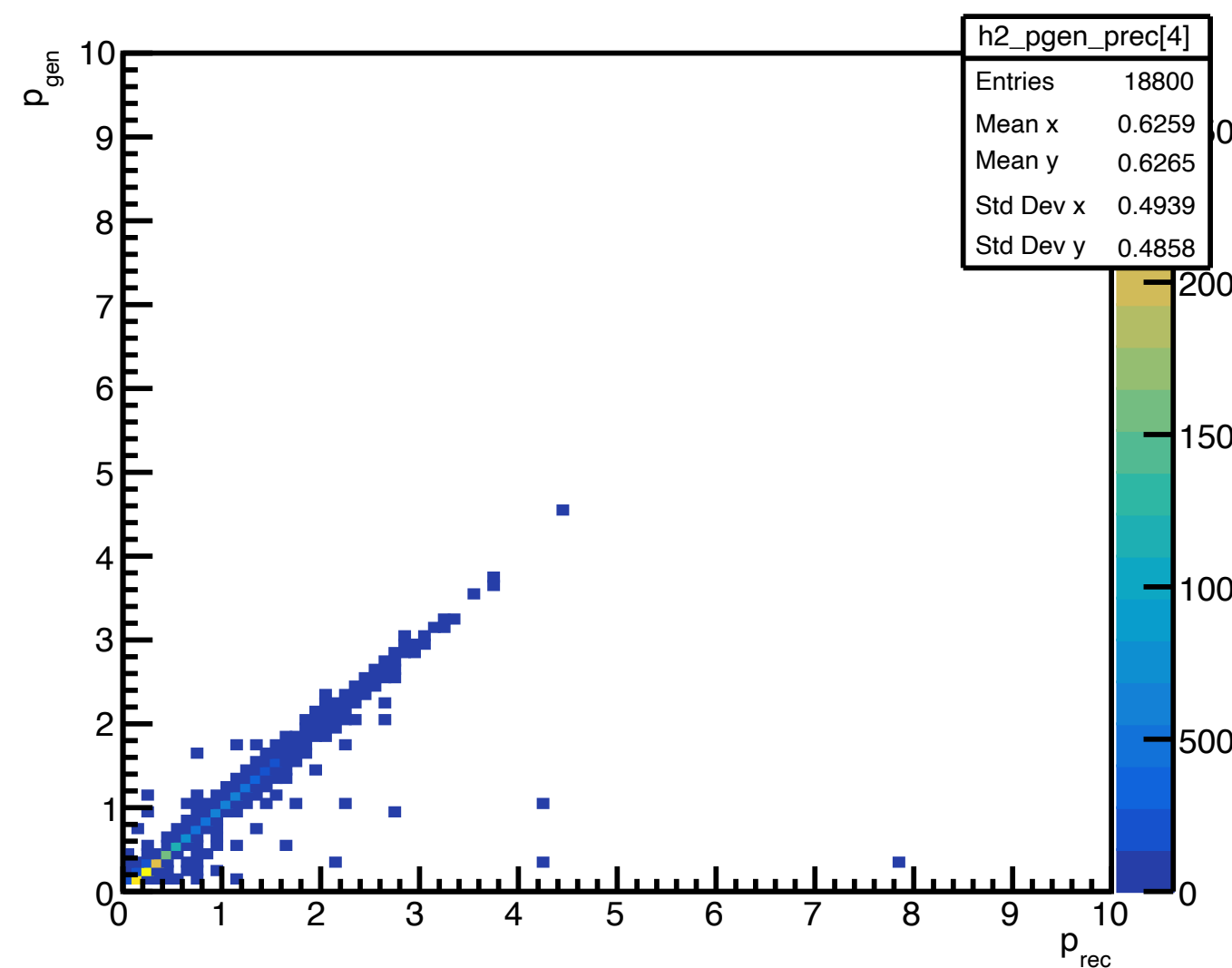
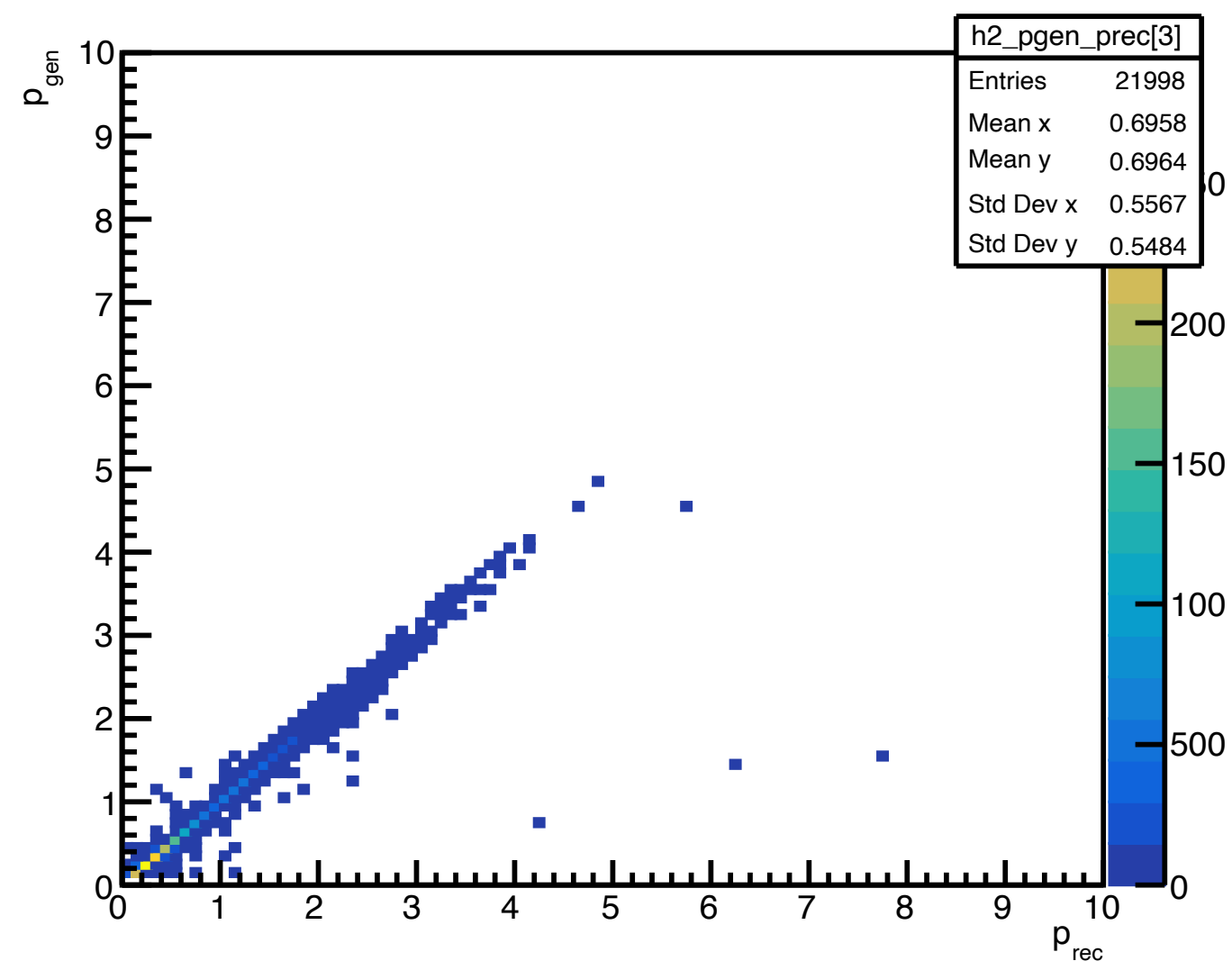
$1.309 < \theta < 1.571$



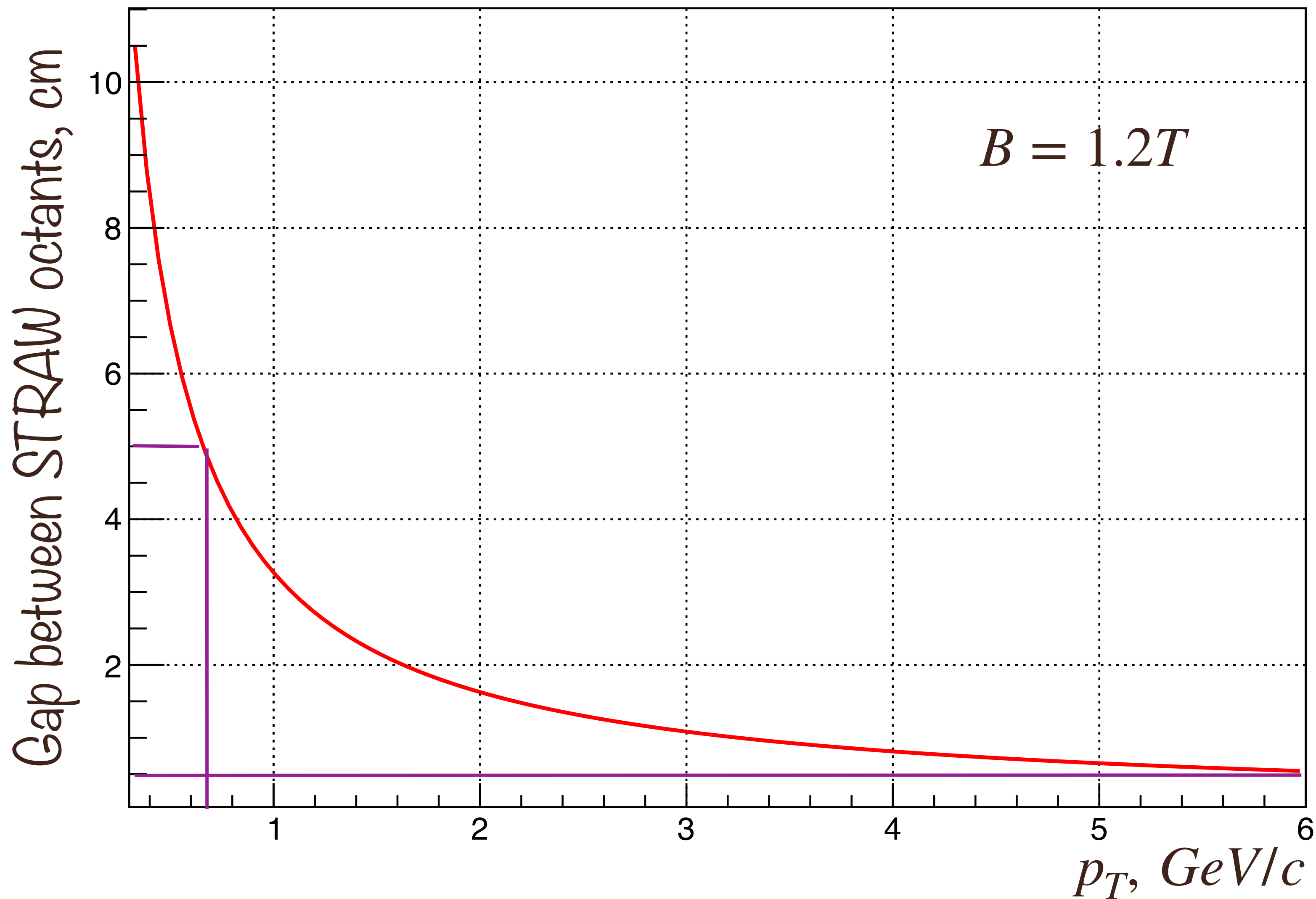
Positive pions: no hits in STRAW but 1 hit in ToF



Prec, GeV/c



Minimal gap between octants for tracks wo STRAW hits



Before March, 16 2023:

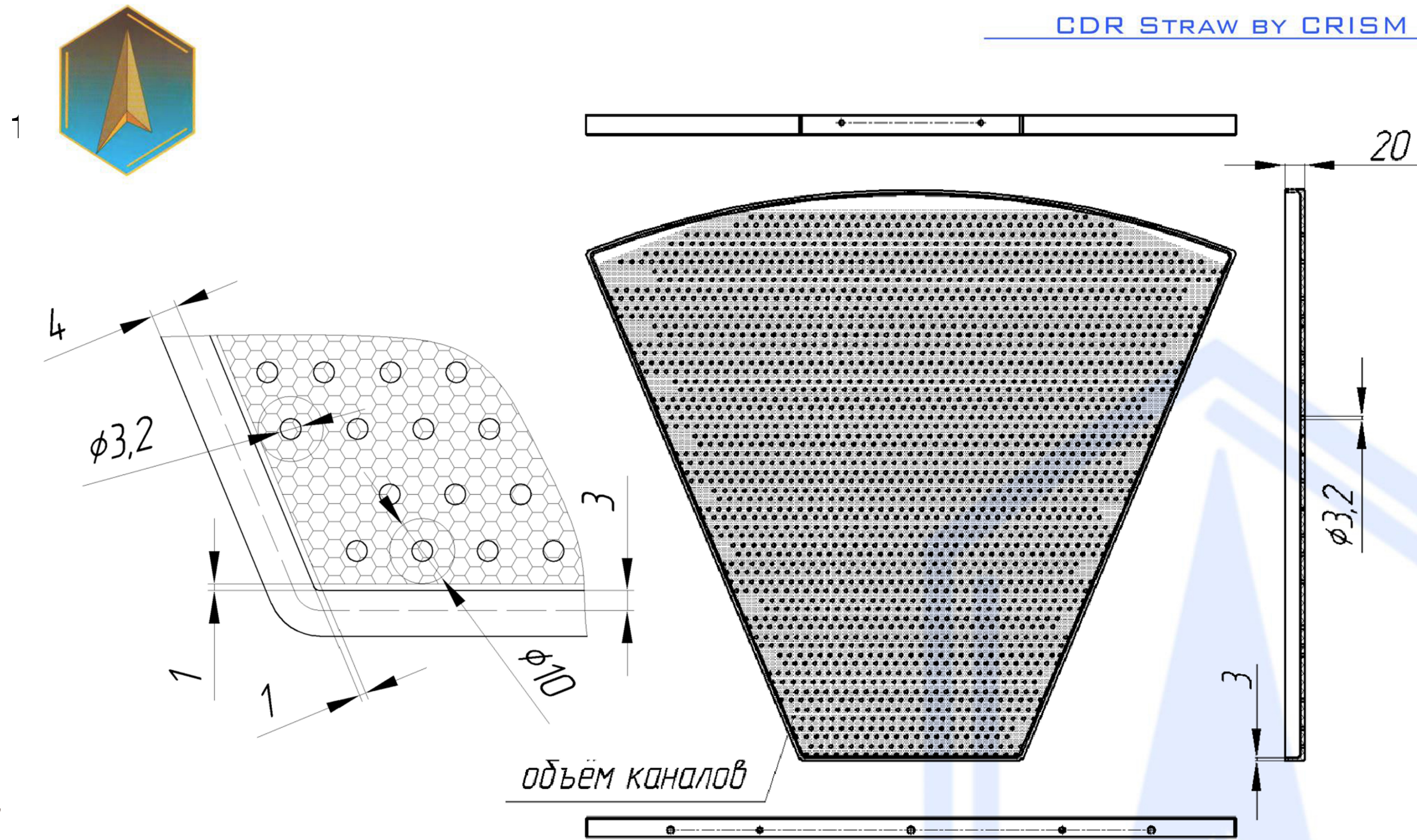
5 cm

After March, 16 2023:

0.4 cm

Minimal gap between octants for tracks wo STRAW hits

Gap between STRAW octants, cm



Before March, 16 2023:

5 cm

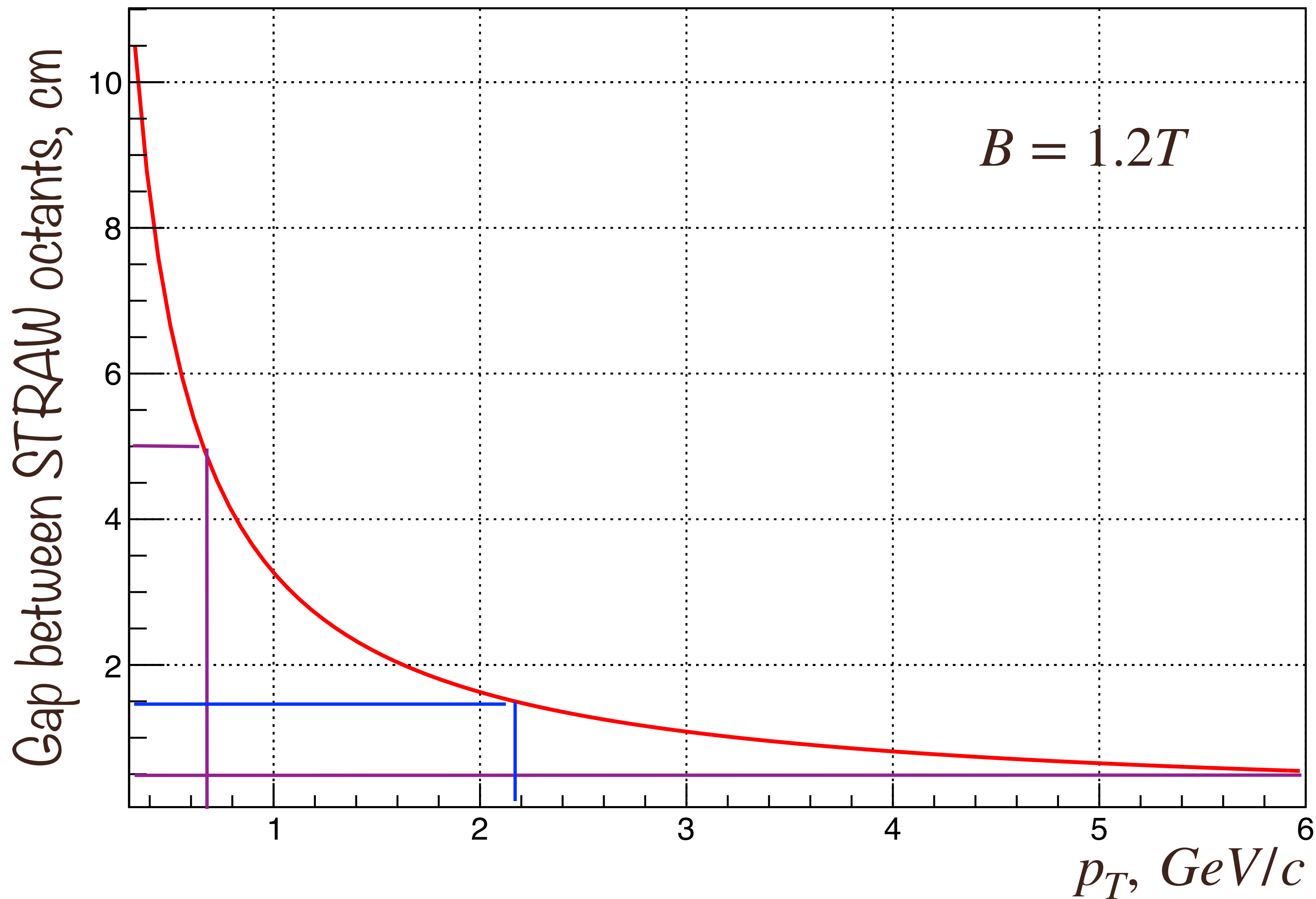
After March, 16 2023:

0.4 cm

According to the drawing

It should be > 1.4 cm

Minimal gap between octants for tracks wo STRAW hits



Before March, 16 2023:

5 cm

After March, 16 2023:

0.4 cm

According to the drawing

It should be > 1.4 cm

Conclusion

- ◆ No hits in ITS == no track (default setting)
- ◆ Up to 15 % of good tracks go through the gap between STRAW octants and have a hit in ToF
- ◆ The gap should be checked and corrected

