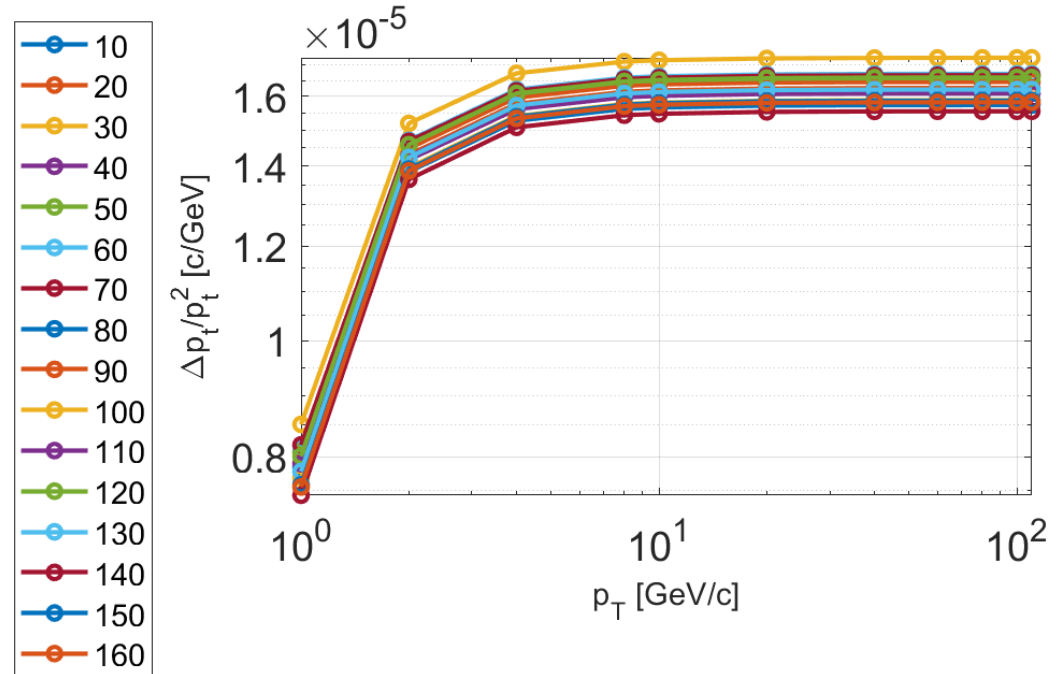
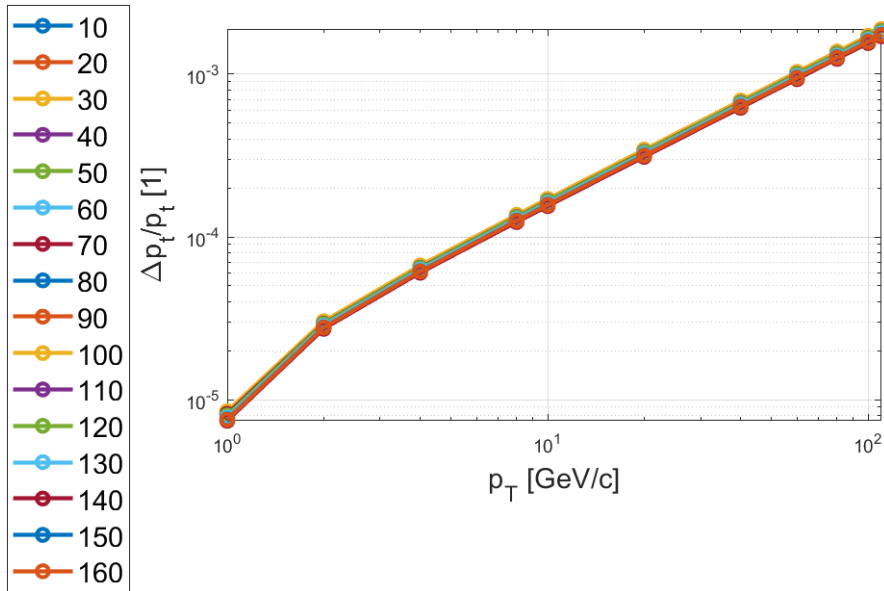


Introduction

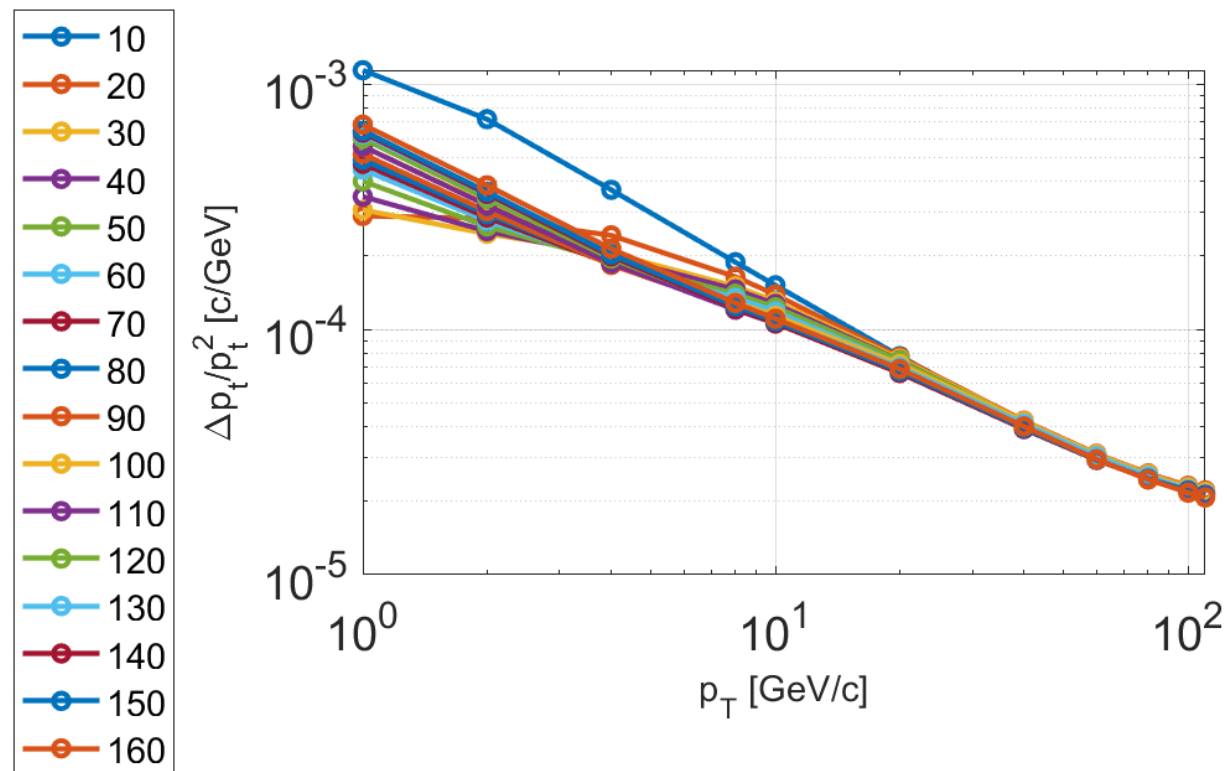
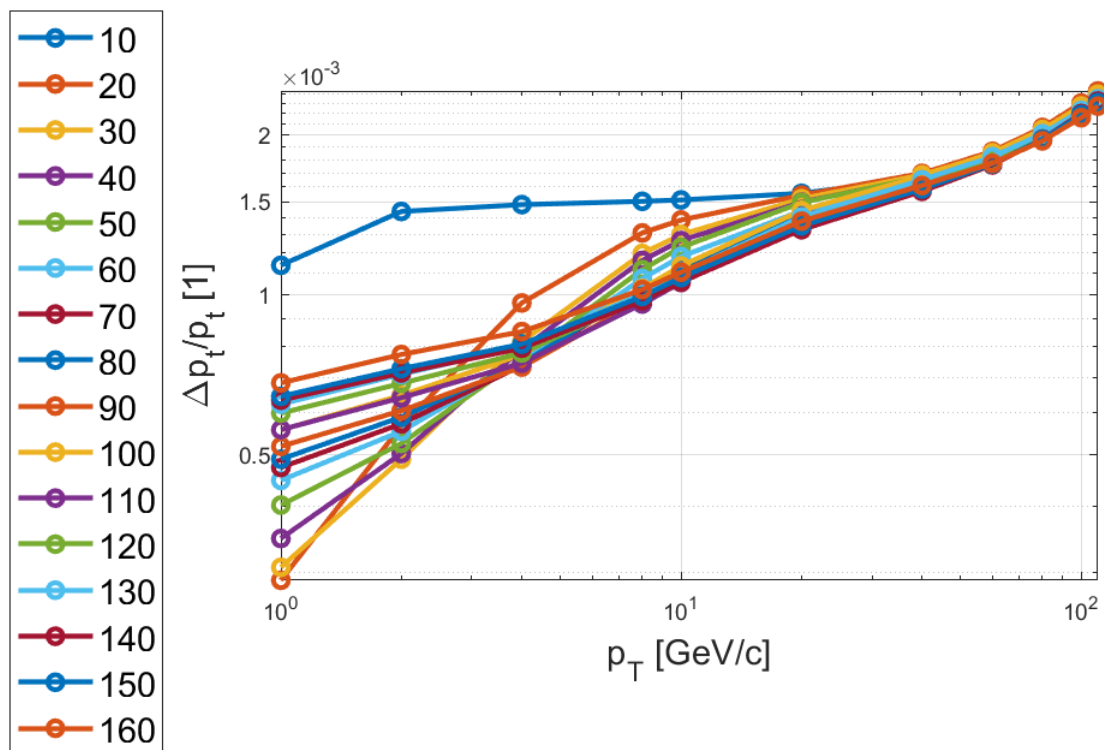
- The main change is the number of layers in the DC compared with xin.

sub detector	N layers	Resoluton(μm)		Material budget ($\%X_0$)
		r- Φ	z_0	
VXD	6	2.8 / 6 / 4 / 4 / 4 / 4	2.8 / 6 / 4 / 4 / 4 / 4	0.15per layer
SID	4	7.2	86.6	0.65
DC	10/20/30.../140/150/160	100	2000	1.2
SET	1	7.2	86.6	0.65

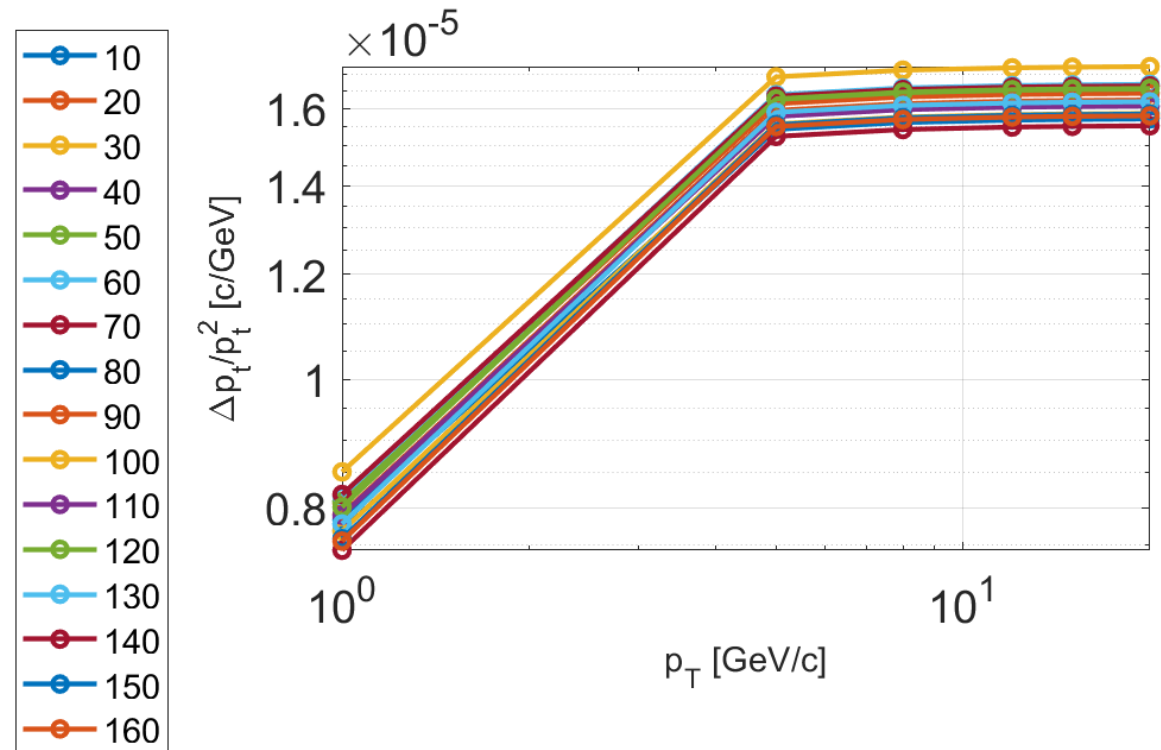
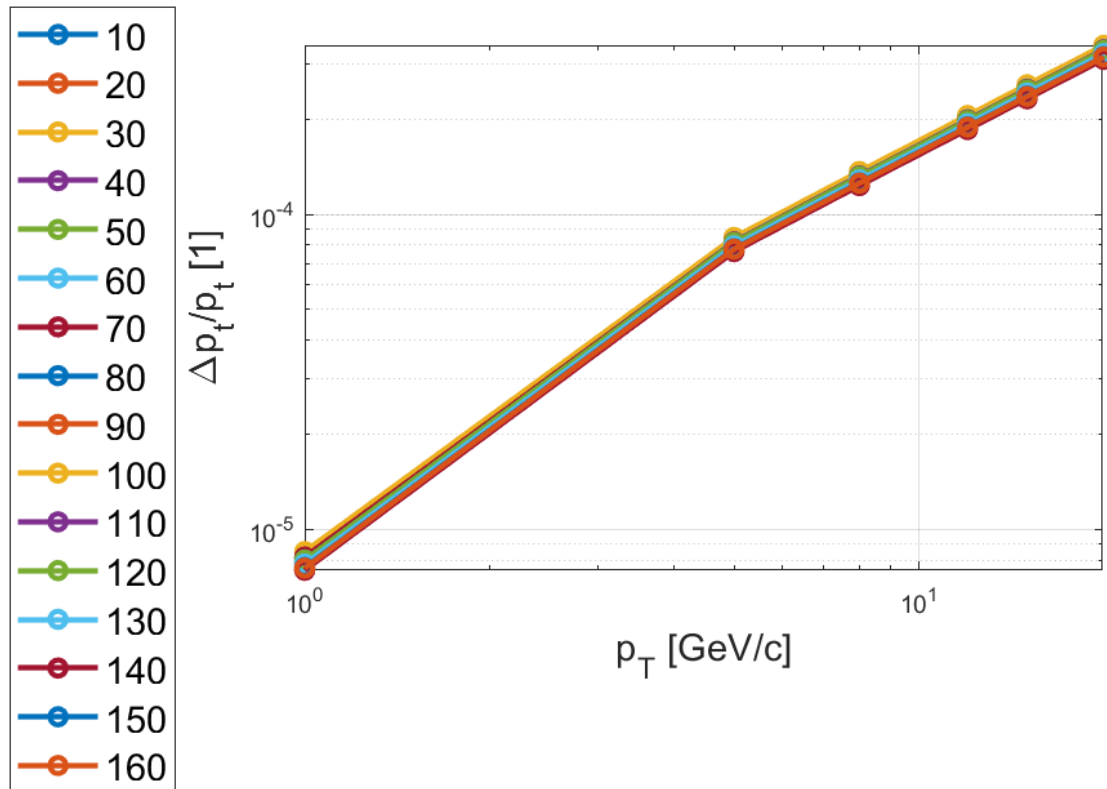
- Without considering of multiple scattering



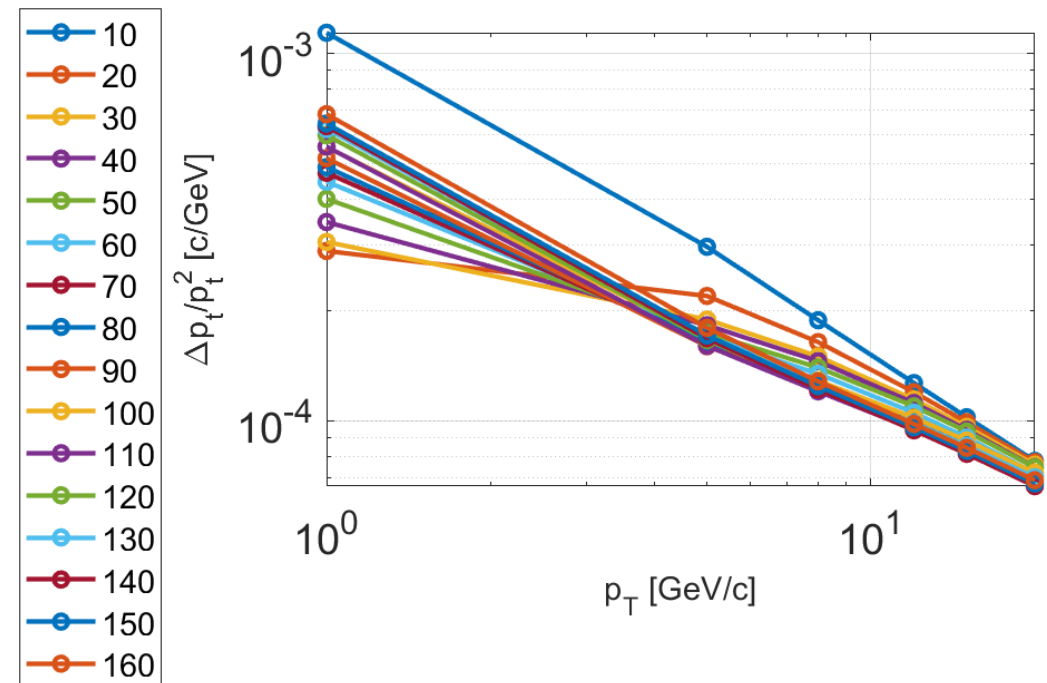
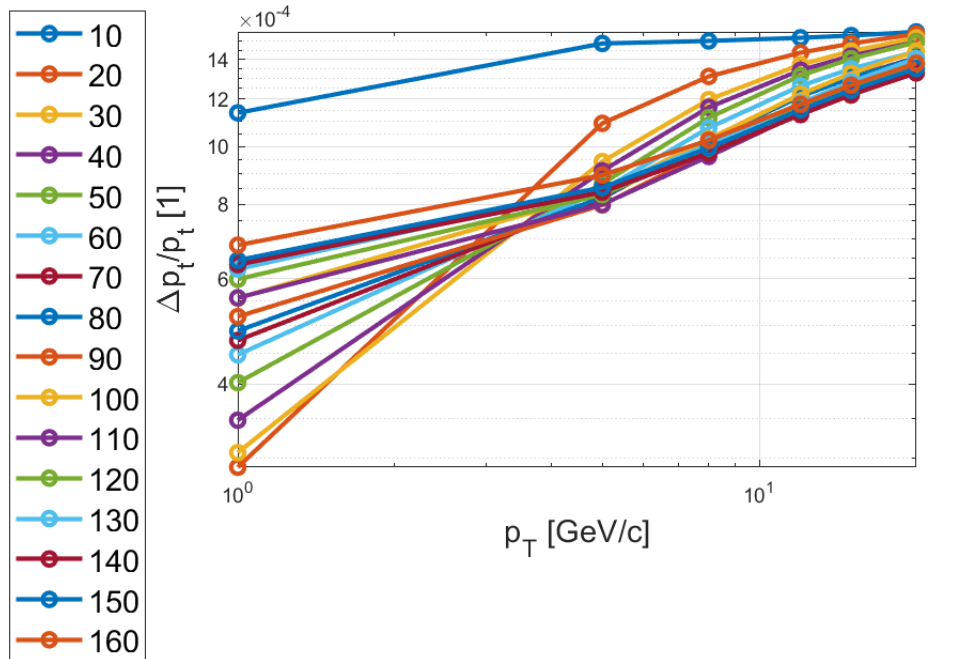
- Layers of TPC between 10 and 160
- considering of multiple scattering



- Momentum is between 1Gev and 20Gev.
- Without considering of multiple scattering

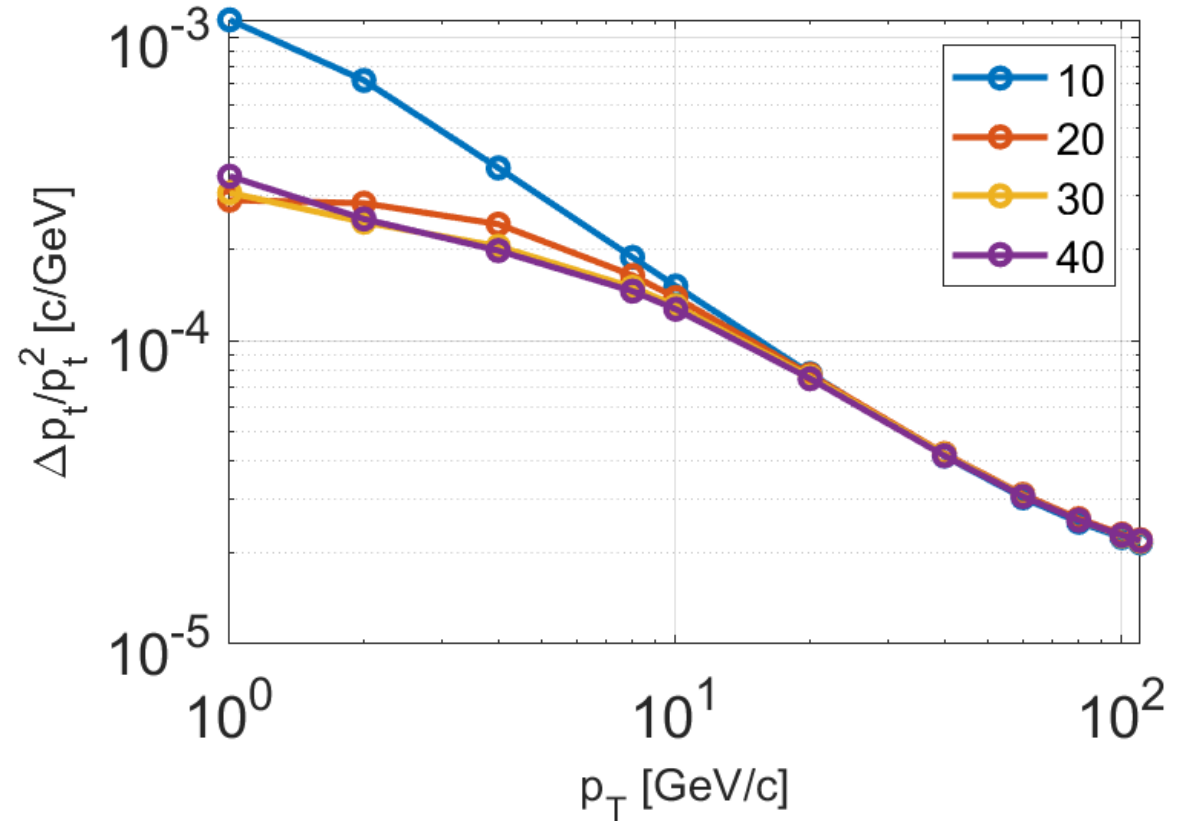
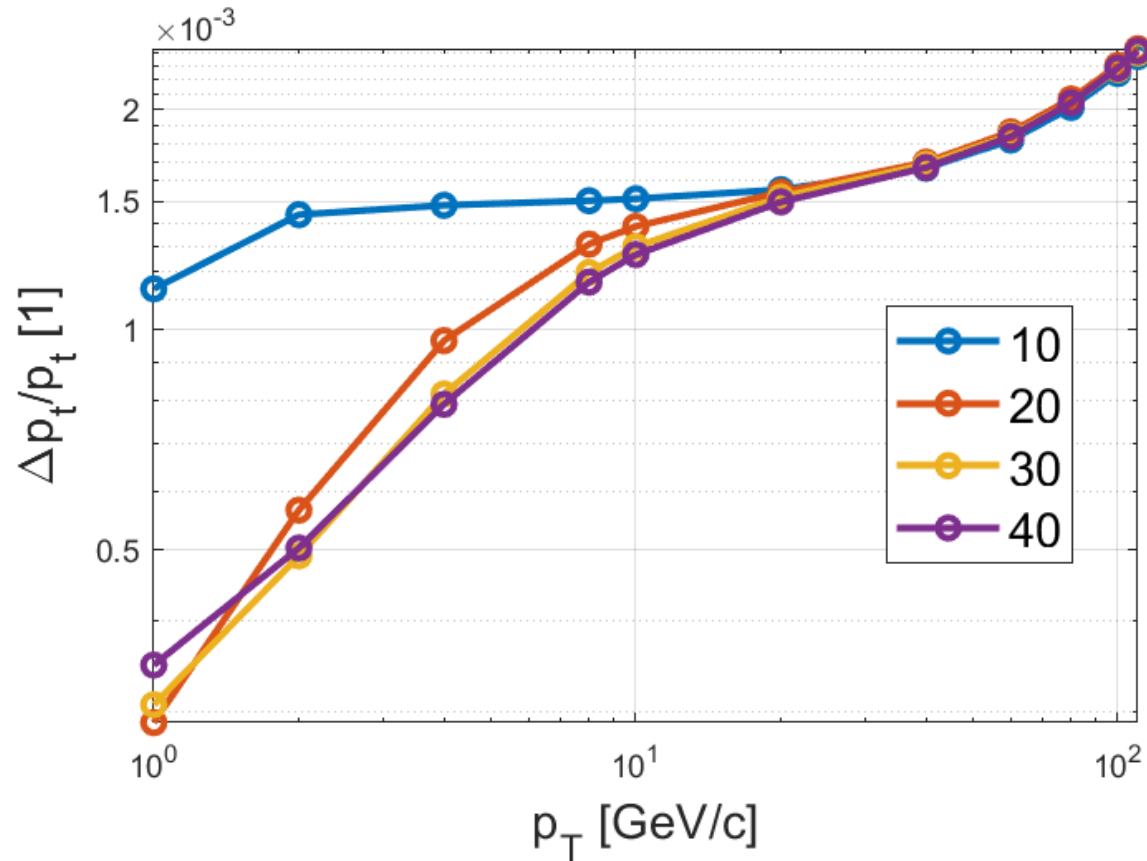


- Momentum is between 1Gev and 20Gev
- considering of multiple scattering



- Layers of TPC between 10 and 40

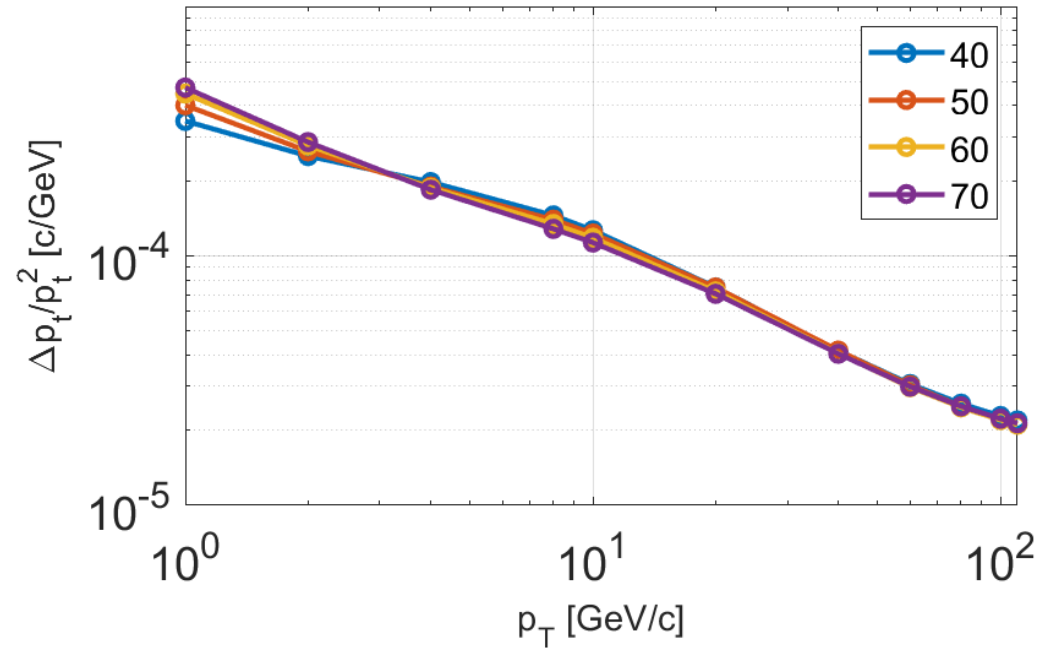
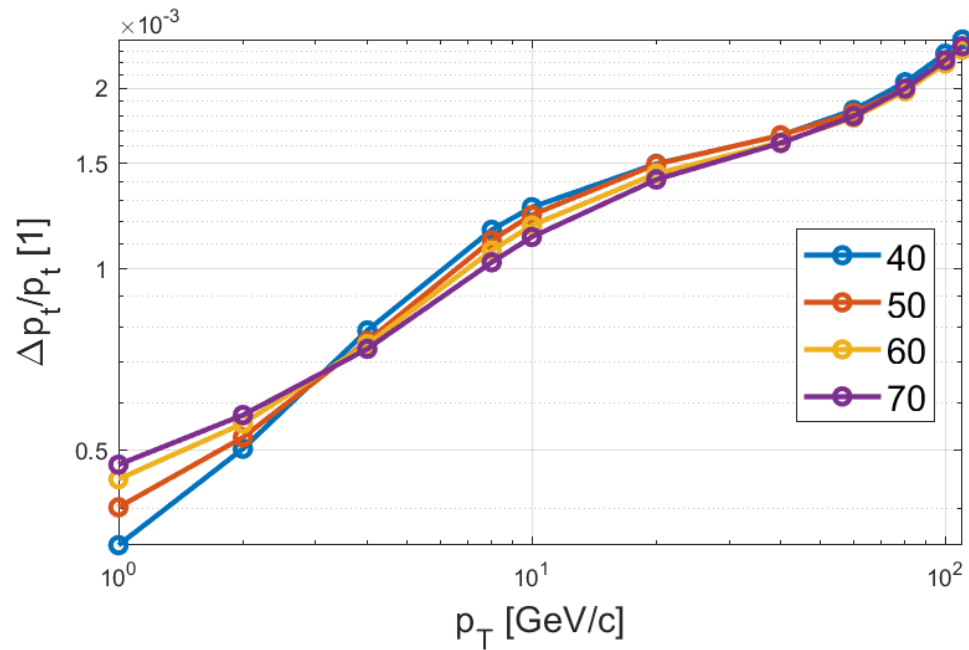
- better resolution in low momentum region with the increase of layers



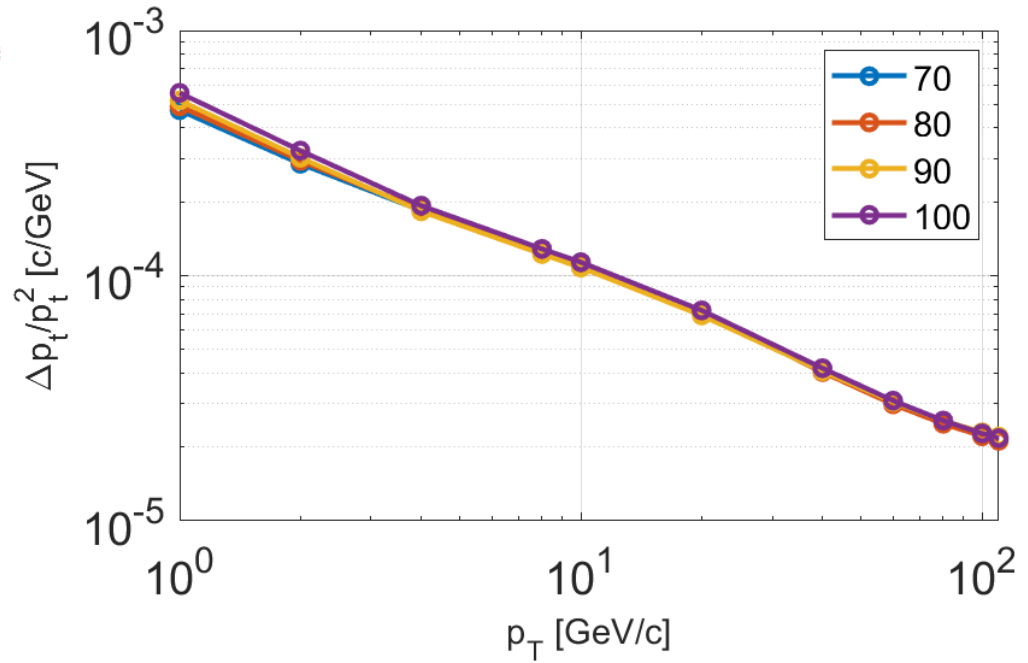
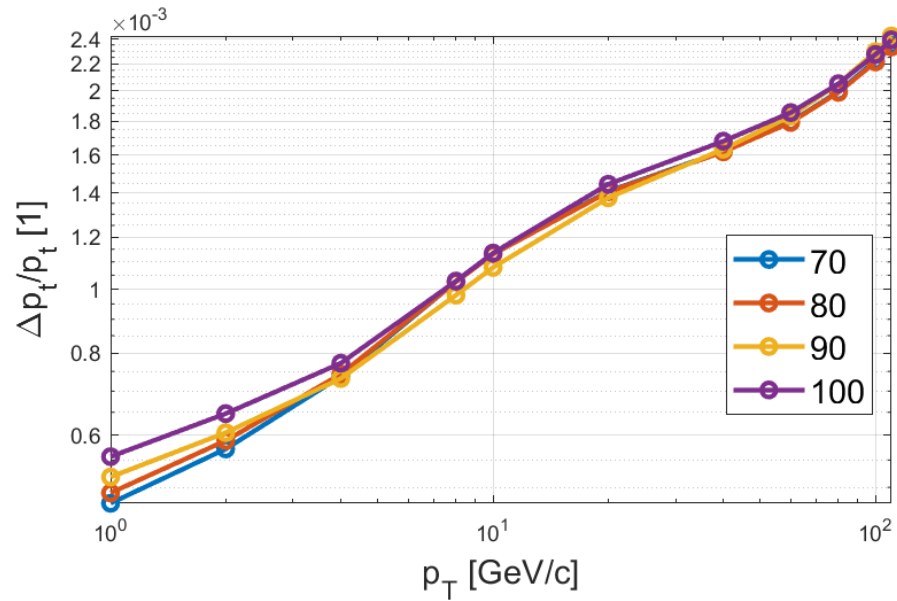
- Layers of TPC between 40 and 70

- Poor resolution in low momentum region with the increase of layers

- The layers of 40 is a critical area.

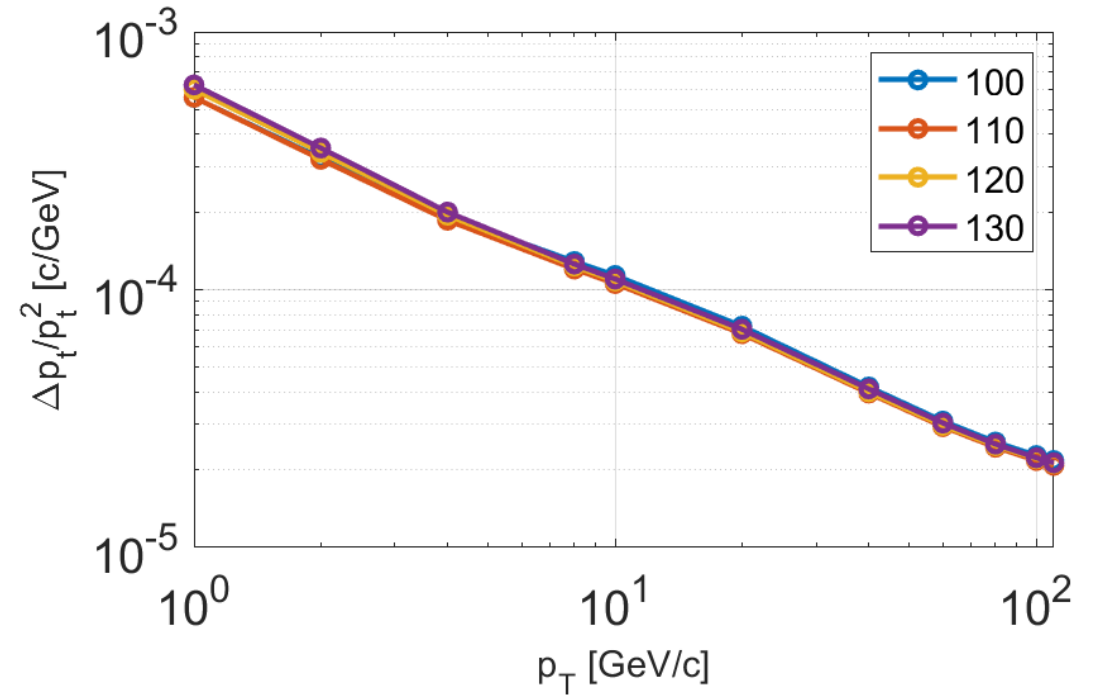
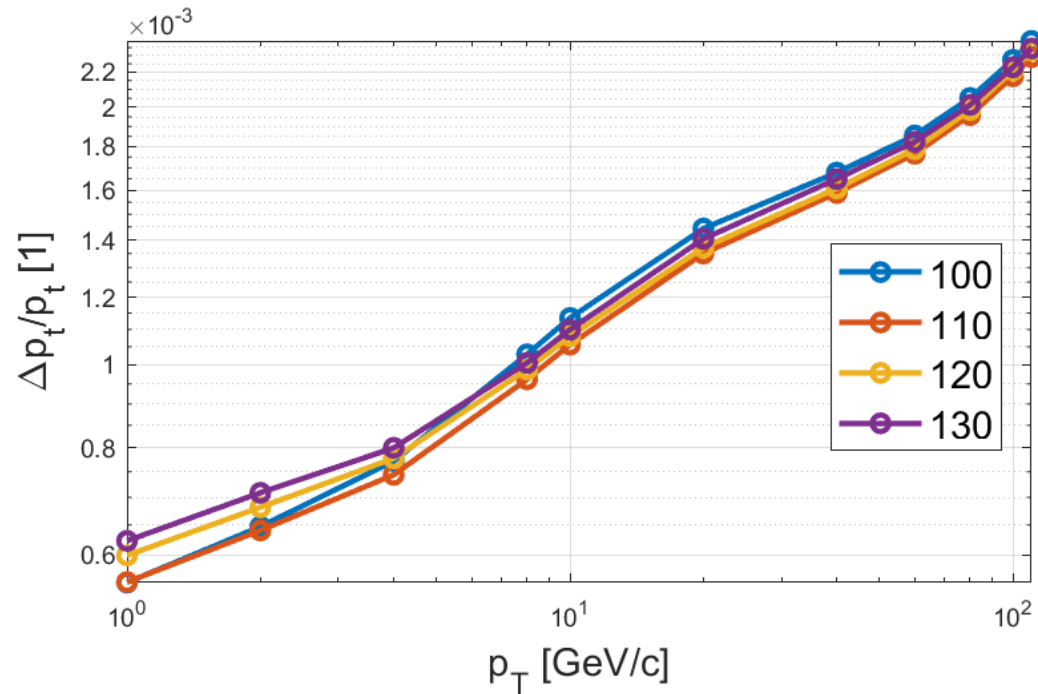


- Layers of TPC between 70 and 100

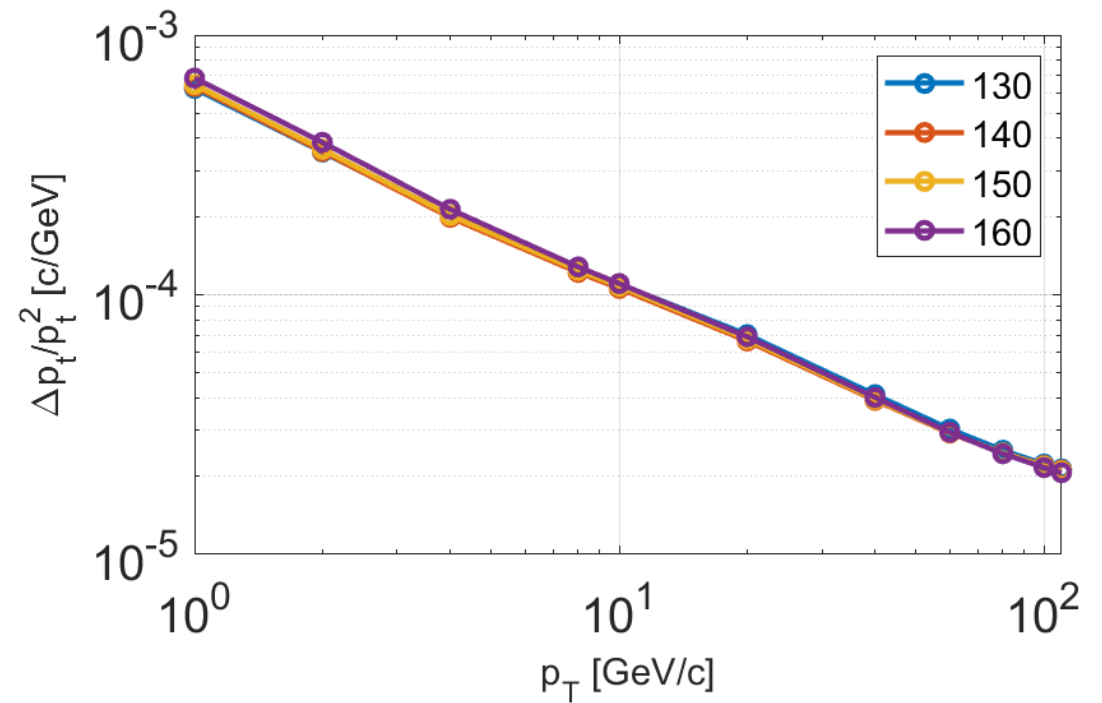
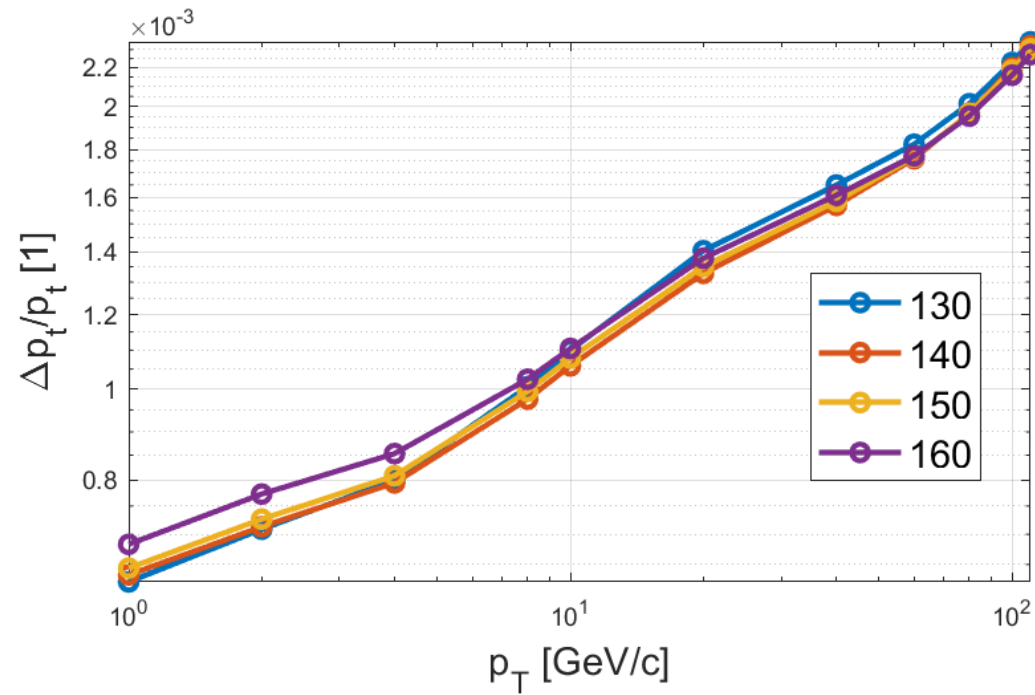


- Layers of TPC between 100 and 130

- The layers of 110 maybe a pretty choice, and further research will be carried out later.



- Layers of TPC between 130 and 160



● Plan

- Further research will be done at $N = 40$ and 110

backup

```
1 01 LiC Detector-Toy (barrel)
2 02 SDT-CEPC
3 03 Version: 20201012
4 04 Vertex Detector (VXD)
5 05
6 06 Number of layers : 8
7 07 Description (optional) : |-Beamt. --|-----Vertex detector-----|
8 08 Names of the layers (opt.) : XBT, VTX1, VTX2, VTX3, VTX4, VTX5, VTX6, XVIXSHELL
9 09 Radii [mm] : 14.5, 16.0, 18.0, 37.0, 39.0, 58.0, 60.0, 65.0
10 10 Upper limit in z [mm] : 4225, 62.5, 62.5, 125, 125, 125, 125, 145
11 11 Lower limit in z [mm] : -4225, -62.5, -62.5, -125, -125, -125, -125, -145
12 12 Efficiency RPhi : 0, 1.0, 1.0, 1.0, 1.0, 1.0, 1.0, 0.0
13 13 Efficiency 2nd coord. (eg. z): -1
14 14 Stereo angle alpha [Rad] : pi/2
15 15 Thickness [rad. lengths] : 0.0015, 0.0015, 0.0015, 0.0015, 0.0015, 0.0015, 0.0015, 0.0015
16 16 error distribution : 0
17 17 0 normal-sigma(RPhi) [1e-6m] : 2.8, 6, 4.0, 4.0, 4.0, 4.0
18 18 sigma(z) [1e-6m] : 2.8, 6, 4.0, 4.0, 4.0, 4.0
19 19 1 uniform-d(RPhi) [1e-6m] : 4.0
20 20 d(z) [1e-6m] : 4.0
21
22 22 Silicon Inner Tracker (SIT)
23 23
24 24 Number of layers : 5
25 25 Description (optional) : |-----Silicon Inner tracker-----|----TPC Inner Wall ----|
26 26 Names of the layers (opt.) : SIT1, SIT2, SIT3, SIT4, XTPCW1
27 27 Radii [mm] : 78.0, 318, 558.0, 798.0, 799.0
28 28 Upper limit in z [mm] : 150.0, 750.0, 1300.0, 2900.0, 2900.0
29 29 Lower limit in z [mm] : -150.0, -750.0, -1300.0, -2900.0, -2900.0
30 30 Efficiency RPhi : 1.00, 1.00, 1.00, 1.0, 0.0
31 31 Efficiency 2nd coord. (eg. z): -1
32 32 Stereo angle alpha [Rad] : pi/2
33 33 Thickness [rad. lengths] : 0.0065, 0.0065, 0.0065, 0.0065, 0.002
34 34 error distribution : 0
35 35 0 normal-sigma(RPhi) [1e-6m] : 7.2
36 36 sigma(z) [1e-6m] : 86.6
37 37 1 uniform-d(RPhi) [1e-6m] : 7.2
38 38 d(z) [1e-6m] : 86.6
39 39
```

```
39 39
40 40 Time Projection Chamber (DC)
41 41  $\sigma^2 = \sigma_0^2 + \sigma_1^2 \sin^2(\beta) + C_{diff}^2 * 6mm/h * \sin(\theta) * L_{drift}[m]$ 
42 42 Number of layers : 10/20/30...../150/160
43 43 Radii [mm] : 800, 1800
44 44 Upper limit in z [mm] : 2900
45 45 Lower limit in z [mm] : -2900
46 46 Efficiency RPhi : 1
47 47 Efficiency z : 1
48 48 Thickness [rad. lengths] : 0.00003356
49 49  $\sigma_0$ (RPhi) [1e-6m] : 100
50 50  $\sigma_1$ (RPhi) [1e-6m] : 0
51 51  $C_{diff}$ (RPhi) [1e-6m/sqrt(m)] : 0
52 52  $\sigma_0$ (z) [1e-6m] : 2828
53 53  $\sigma_1$ (z) [1e-6m] : 0
54 54  $C_{diff}$ (z) [1e-6m/sqrt(m)] : 0
55 55
56 56 Silicon Tracker (SET)
57 57
58 58 Number of layers : 2
59 59 Description (optional) : TPC outer wall |-----External Tracker-----|
60 60 Names of the layers (opt.) : XTPCW2, SET1
61 61 Radii [mm] : 1801.0, 1811
62 62 Upper limit in z [mm] : 2900, 2900
63 63 Lower limit in z [mm] : -2900, -2900
64 64 Efficiency RPhi : 0.0, 1.0
65 65 Efficiency 2nd coord. (eg. z): -1
66 66 Stereo angle alpha [Rad] : pi/2
67 67 Thickness [rad. lengths] : 0.010, 0.0065
68 68 error distribution : 0
69 69 0 normal-sigma(RPhi) [1e-6m] : 7.2
70 70 sigma(z) [1e-6m] : 86.6
71 71 1 uniform-d(RPhi) [1e-6m] : 7.2
72 72 d(z) [1e-6m] : 86.6
73 73
74 74 Magnetic field and beam spot
75 75
76 76 Solenoid magnetic field [T] : 3.0
77 77 Range in x [mm] : -0.0 0.0
78 78 Range in y [mm] : -0.0 0.0
79 79 Range in z [mm] : -0.0 0.0
80
```