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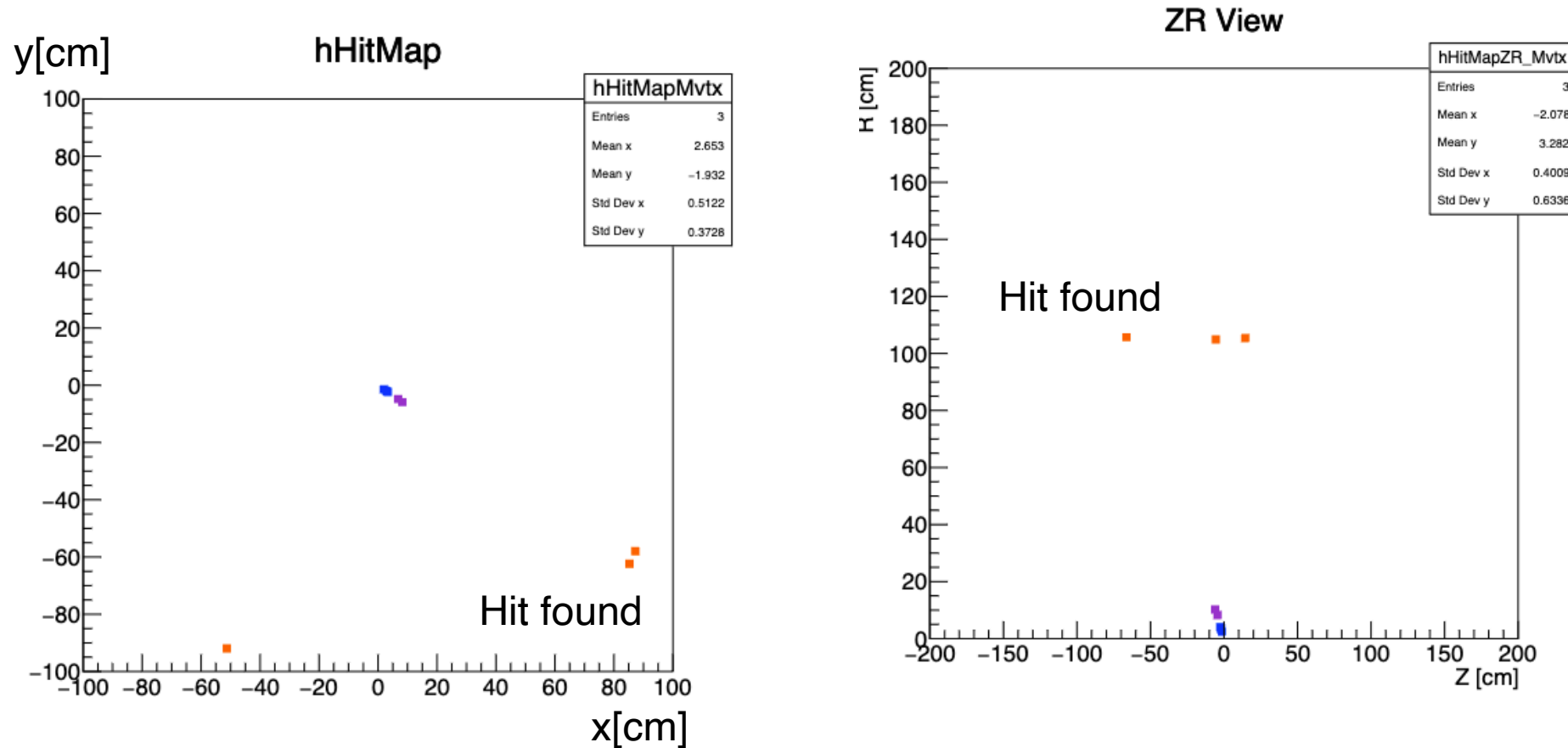
# Problem on generator build

From last meeting, I mentioned :

- Found problem on the single gun simulation code(Did not load oHCal properly)
- > Still need more investigation (might be problem on the ana build or something else)

# Quick event display check(1)

Event display on xy, rz plane shows resonable seed pair with silicon and EMCal  
 -> HitFinding algorithm seems to be fine

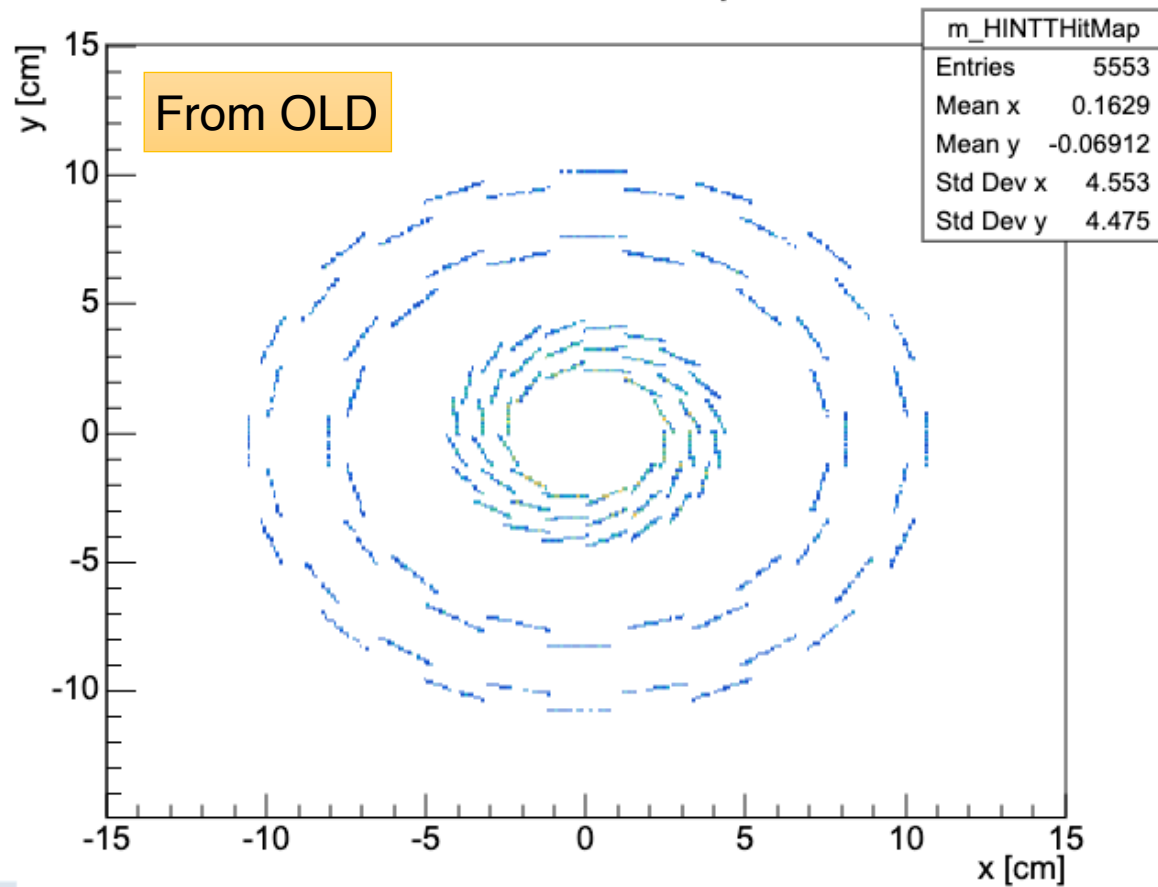


# Quick event display check(2)

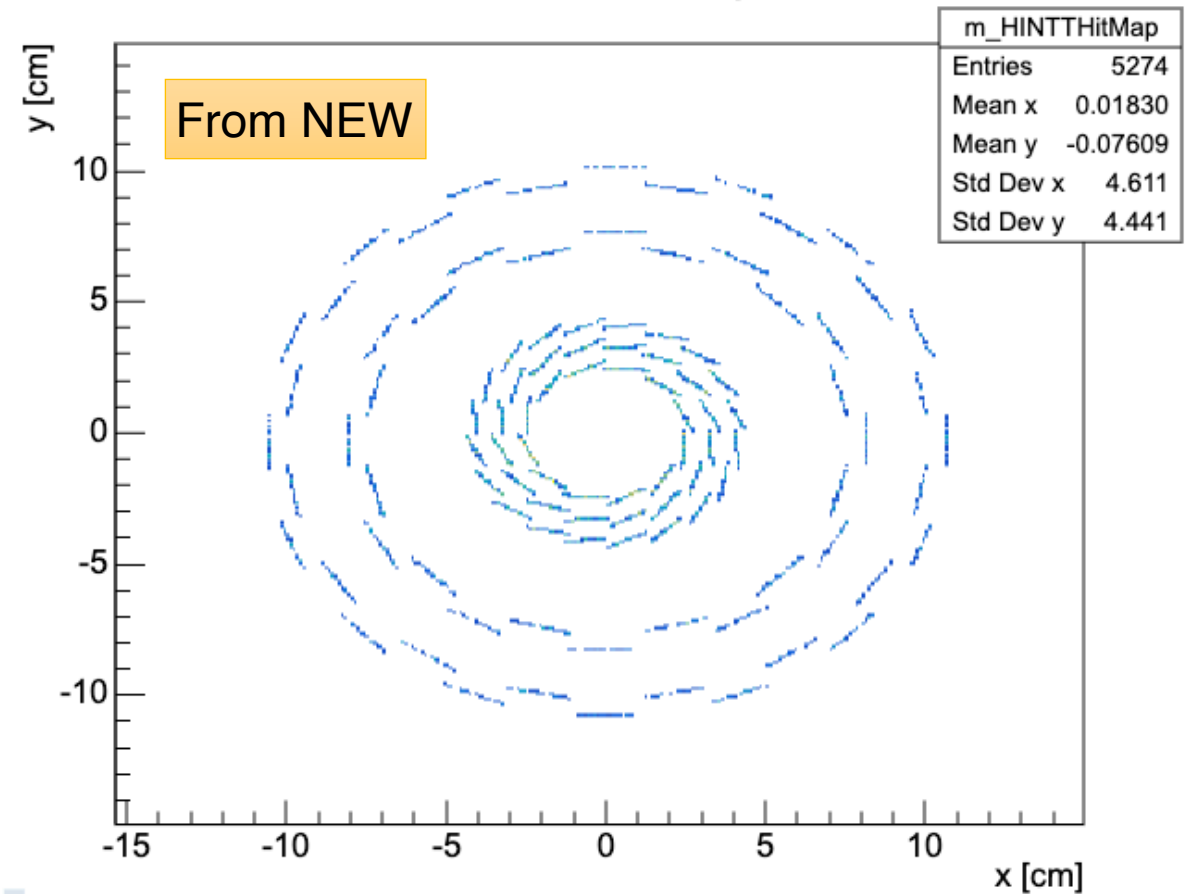
Silicon Event display on xy plane

Silicon alignment files are identical each other regardless of the new/old generator

Global Hit Map



Global Hit Map



(x1,y1)

(x2,y2)

(x3,y3)

Calculated SagittaR, estimated center X, center Y

Double\_t pT = 0.3 \* 1.4 \* sagittaR \* 0.01; // 0.3 \* 1.4 T \*(R [cm -> m])

```
== event1 =====
tempInttId : 5HitsXY:
0 0
-9.63309 -2.94646
-88.7964 -29.3447
sagittaR = 1867.76, centerX = 541.488, centerY = -1787.55
truthPt = 8.21376, sagittaPt = 7.8446, dPt = -0.0449434 TruthEta : -0.989457
== event2 =====
tempInttId : 5HitsXY:
0 0
-7.90491 6.71244
-72.9836 58.444
sagittaR = 1444.43, centerX = -938.887, centerY = -1097.67
truthPt = 7.06349, sagittaPt = 6.06662, dPt = -0.14113 TruthEta : 0.266558
== event3 =====
tempInttId : 5HitsXY:
0 0
-3.87232 9.45371
-37.7089 85.5511
sagittaR = 1577.81, centerX = -1462, centerY = -593.33
truthPt = 6.8176, sagittaPt = 6.62682, dPt = -0.027983 TruthEta : -0.88979
```

From old build  
with old G4Setup

```
== event1 =====
tempInttId : 5HitsXY:
0 0
5.06527 9.02685
51.3856 91.3611
sagittaR = 47419.5, centerX = 41356.3, centerY = -23200.5
truthPt = 5.53702, sagittaPt = 199.162, dPt = 34.9691 TruthEta : -0.774697
== event2 =====
tempInttId : 5HitsXY:
0 0
8.38149 5.17048
89.0043 55.106
sagittaR = 29174.5, centerX = -15313.2, centerY = 24832.6
truthPt = 7.54094, sagittaPt = 122.533, dPt = 15.249 TruthEta : -0.143312
== event3 =====
tempInttId : 5HitsXY:
0 0
3.42721 -10.2693
32.9857 -99.7336
sagittaR = 17461.4, centerX = -16561.6, centerY = -5532.88
truthPt = 3.45607, sagittaPt = 73.3378, dPt = 20.22 TruthEta : 0.145397
```

From new build  
With new G4Setup

**Problem might be on Magnetic field map used(Different G4Setup\_sPHENIX.C used)**

(x1,y1)

(x2,y2)

(x3,y3)

Calculated SagittaR, estimated center X, center Y

Double\_t pT = 0.3 \* 1.4 \* sagittaR \* 0.01; // 0.3 \* 1.4 T \*(R [cm -> m])

```
== event1 =====
tempInttId : 5HitsXY:
0 0
-7.87629 -6.40695
-71.7646 -70.3548
sagittaR = 488.829, centerX = 304.513, centerY = -382.394
truthPt = 2.15394, sagittaPt = 2.05308, dPt = -0.0468264 TruthEta : -0.690391
== event2 =====
tempInttId : 5HitsXY:
0 0
-9.614 2.38964
-97.8296 16.6229
sagittaR = 593.804, centerX = -148.039, centerY = -575.054
truthPt = 2.79547, sagittaPt = 2.49398, dPt = -0.107851 TruthEta : -0.456638
== event3 =====
tempInttId : 5HitsXY:
0 0
7.89622 -7.40043
73.4348 -64.6969
sagittaR = 1414.64, centerX = 971.315, centerY = 1028.48
truthPt = 8.23058, sagittaPt = 5.9415, dPt = -0.278119 TruthEta : -0.666502
```

From old build  
with old G4Setup

```
== event1 =====
tempInttId : 5HitsXY:
0 0
5.06527 9.02685
51.3856 91.3611
sagittaR = 47419.5, centerX = 41356.3, centerY = -23200.5
truthPt = 5.53702, sagittaPt = 199.162, dPt = 34.9691 TruthEta : -0.774697
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truthPt = 3.45607, sagittaPt = 73.3378, dPt = 20.22 TruthEta : 0.145397
```

From new build  
With new G4Setup

**With OLD G4Setup, it shows the significant improvement on sagitta calculations**

What is difference between Old G4Setup and New G4Setup?

```
[jaein213 21:27:40 gen_macro] $diff G4Setup_sPHENIX.C G4Setup_sPHENIX_ly.C
102c102
<      G4MAGNET::magfield.find(".root") == string::npos)
---
>      G4MAGNET::magfield = "CDB")
114d113
<      G4MAGNET::magfield_tracking = G4MAGNET::magfield; // set tracking fieldmap to value
225c224
< #endif
---
> #endif
\ No newline at end of file
```

Only Magnetic field map loader is different. -> Check more details

Now, Jinyu's new geometry setting has been imported.

-> Will check several tracking performance plots with new geometry

Once the generator issue is addressed, will move to charged hadron energy deposit in EMCal  
(Or checking it only without track-EMCal Matching ; Just comparing G4 Etruth vs EMCal energy recorded)