

Different Castor reconstruction results with same GATE geometry architectures

Xiaozhuang Wang
ahwxz123@mail.ustc.edu.cn

OutLine

- Two Gate mac files
- Different descriptions in start-unit planting
- Same simulation results
- Different Castor reconstruction results
- Reason : different unitID definition in GATE

• Two Gate mac files

Different start planting location

```

1 /vis/disable
2 /gate/geometry/setMaterialDatabase /home/petgroup/tools/gate_v7.1/GateMaterials.db
3 /gate/world/geometry/setXLength 90. cm
4 /gate/world/geometry/setYLength 90. cm
5 /gate/world/geometry/setZLength 100. cm
6 /gate/world/daughters/name cylindricalPET
7 /gate/world/daughters/insert cylinder
8 /gate/cylindricalPET/setMaterial Air
9 /gate/cylindricalPET/geometry/setTranslation 0.0 0.0 0.0 mm
10 /gate/cylindricalPET/geometry/setRmax 440.00 mm
11 /gate/cylindricalPET/geometry/setRmin 410.00 mm
12 /gate/cylindricalPET/geometry/setHeight 201.4 mm
13 /gate/cylindricalPET/vis/setVisible 1
14 /gate/cylindricalPET/daughters/name rsector
15 /gate/cylindricalPET/daughters/insert box
16 /gate/rsector/geometry/setTranslation 0.0 425.0 0.0 mm
17 /gate/rsector/geometry/setXLength 67.20 mm
18 /gate/rsector/geometry/setYLength 20.00 mm
19 /gate/rsector/geometry/setZLength 201.4 mm
20 /gate/rsector/setMaterial Air
21 /gate/rsector/vis/forceSolid
22 /gate/rsector/vis/setVisible 1
23 /gate/rsector/vis/setColor blue
24 /gate/rsector/daughters/name module
25 /gate/rsector/daughters/insert box
26 /gate/module/geometry/setTranslation 0.0 0.0 0.0 mm
27 /gate/module/geometry/setXLength 67.20 mm
28 /gate/module/geometry/setYLength 20.00 mm
29 /gate/module/geometry/setZLength 100.6 mm
30 /gate/module/setMaterial Air
31 /gate/module/vis/forceSolid
32 /gate/module/vis/setVisible 1
33 /gate/module/vis/setColor green
34 /gate/module/daughters/name submodule
35 /gate/module/daughters/insert box
36 /gate/submodule/geometry/setTranslation 0.0 0.0 0.0 mm
37 /gate/submodule/geometry/setXLength 33.40 mm
38 /gate/submodule/geometry/setYLength 20.00 mm
39 /gate/submodule/geometry/setZLength 33.40 mm

```

```

78 /gate/rsector/ring/setRepeatNumber 38
79 /gate/rsector/ring/setFirstAngle 0.0 deg
80 /gate/rsector/ring/setAngularSpan 360 deg
81 /gate/systems/cylindricalPET/rsector/attach rsector
82 /gate/systems/cylindricalPET/module/attach module
83 /gate/systems/cylindricalPET/submodule/attach submodule
84 /gate/systems/cylindricalPET/crystal/attach crystal
85 /gate/systems/cylindricalPET/layer0/attach det0
86 /gate/det0/attachCrystalSD
87 /gate/systems/cylindricalPET/describe

```

Start planting at Y axis

```

1 /vis/disable
2 /gate/geometry/setMaterialDatabase /home/petgroup/tools/gate_v7.1/GateMaterials.db
3 /gate/world/geometry/setXLength 90. cm
4 /gate/world/geometry/setYLength 90. cm
5 /gate/world/geometry/setZLength 100. cm
6 /gate/world/daughters/name cylindricalPET
7 /gate/world/daughters/insert cylinder
8 /gate/cylindricalPET/setMaterial Air
9 /gate/cylindricalPET/geometry/setTranslation 0.0 0.0 0.0 mm
10 /gate/cylindricalPET/geometry/setRmax 440.00 mm
11 /gate/cylindricalPET/geometry/setRmin 410.00 mm
12 /gate/cylindricalPET/geometry/setHeight 201.4 mm
13 /gate/cylindricalPET/vis/setVisible 1
14 /gate/cylindricalPET/daughters/name rsector
15 /gate/cylindricalPET/daughters/insert box
16 /gate/rsector/geometry/setTranslation 425.0 0.0 0.0 mm
17 /gate/rsector/geometry/setXLength 20.00 mm
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20 /gate/rsector/setMaterial Air
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23 /gate/rsector/vis/setColor blue
24 /gate/rsector/daughters/name module
25 /gate/rsector/daughters/insert box
26 /gate/module/geometry/setTranslation 0.0 0.0 0.0 mm
27 /gate/module/geometry/setXLength 20.00 mm
28 /gate/module/geometry/setYLength 67.20 mm
29 /gate/module/geometry/setZLength 100.6 mm
30 /gate/module/setMaterial Air
31 /gate/module/vis/forceSolid
32 /gate/module/vis/setVisible 1
33 /gate/module/vis/setColor green
34 /gate/module/daughters/name submodule
35 /gate/module/daughters/insert box
36 /gate/submodule/geometry/setTranslation 0.0 0.0 0.0 mm
37 /gate/submodule/geometry/setXLength 20.00 mm
38 /gate/submodule/geometry/setYLength 33.4 mm
39 /gate/submodule/geometry/setZLength 33.4 mm

```

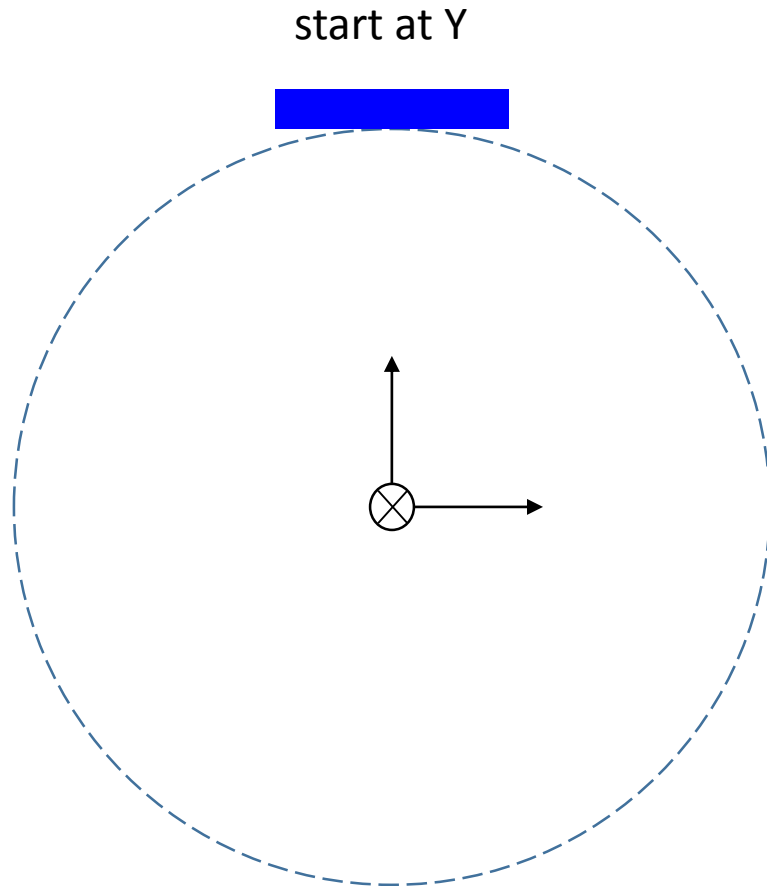
```

78 /gate/rsector/ring/setRepeatNumber 38
79 /gate/rsector/ring/setFirstAngle 90.0 deg
80 /gate/rsector/ring/setAngularSpan 360 deg
81 /gate/systems/cylindricalPET/rsector/attach rsector
82 /gate/systems/cylindricalPET/module/attach module
83 /gate/systems/cylindricalPET/submodule/attach submodule
84 /gate/systems/cylindricalPET/crystal/attach crystal
85 /gate/systems/cylindricalPET/layer0/attach det0
86 /gate/det0/attachCrystalSD
87 /gate/systems/cylindricalPET/describe

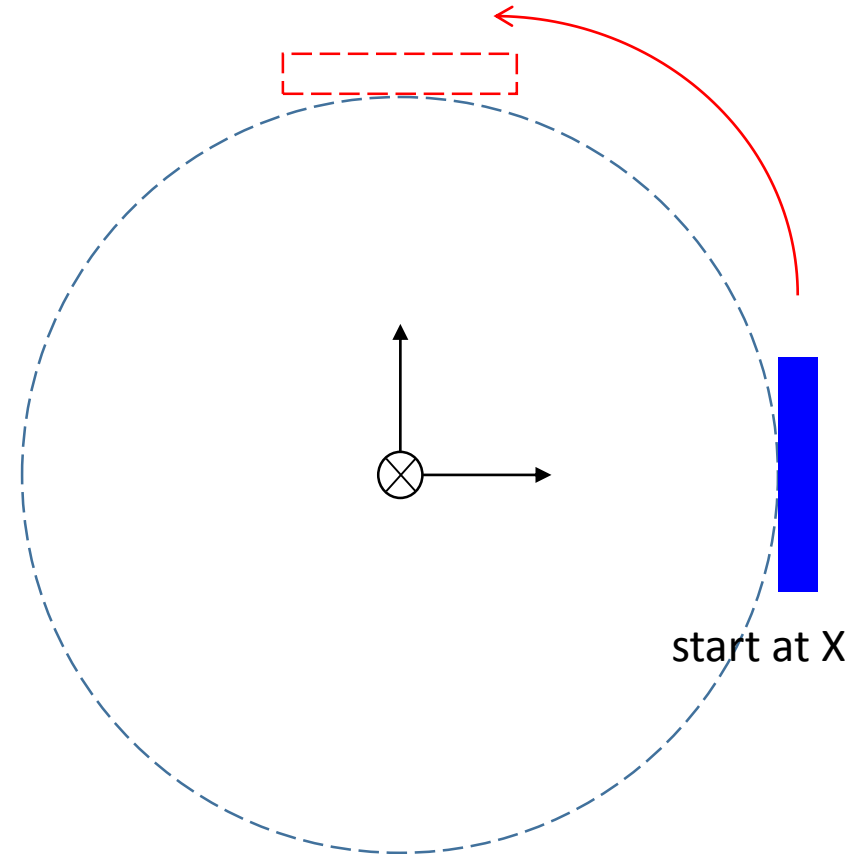
```

Start planting at X axis + rotate span angle 90 degree

- Description in geometry definition

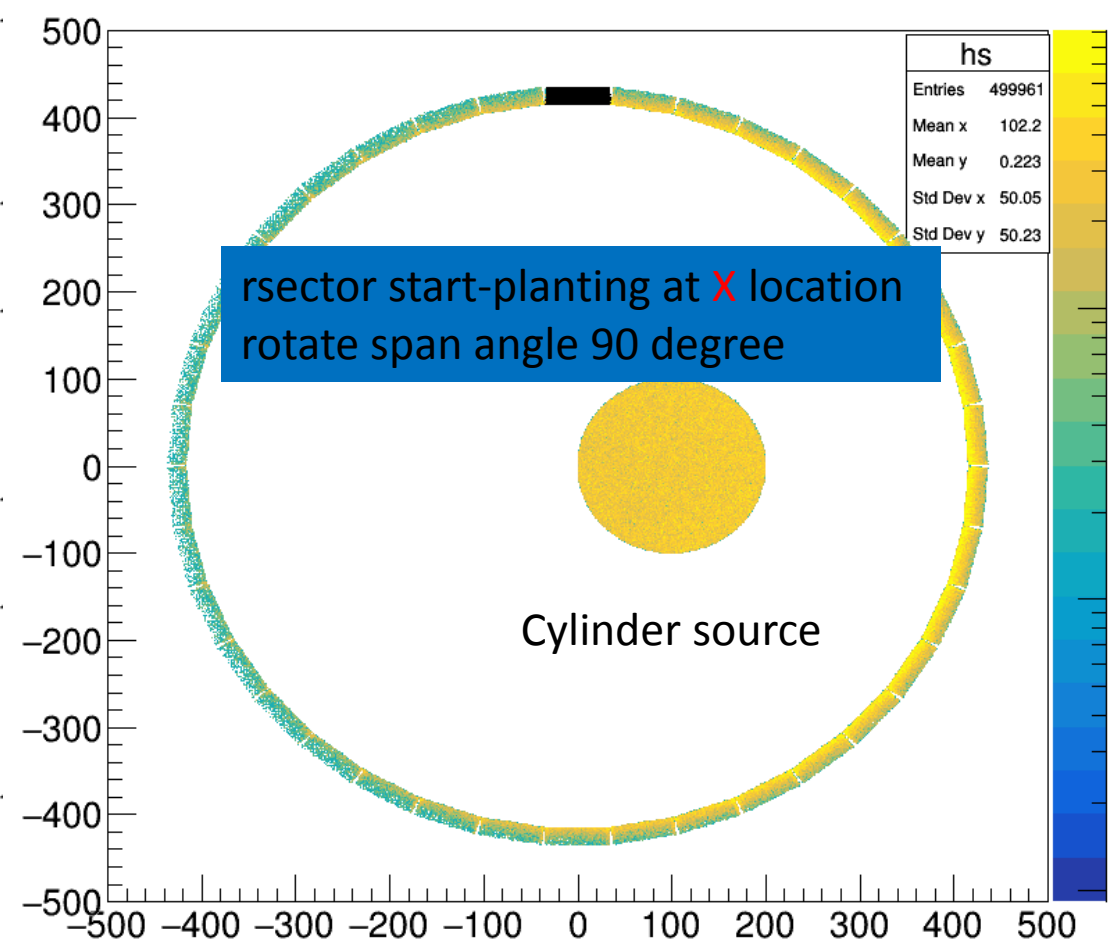
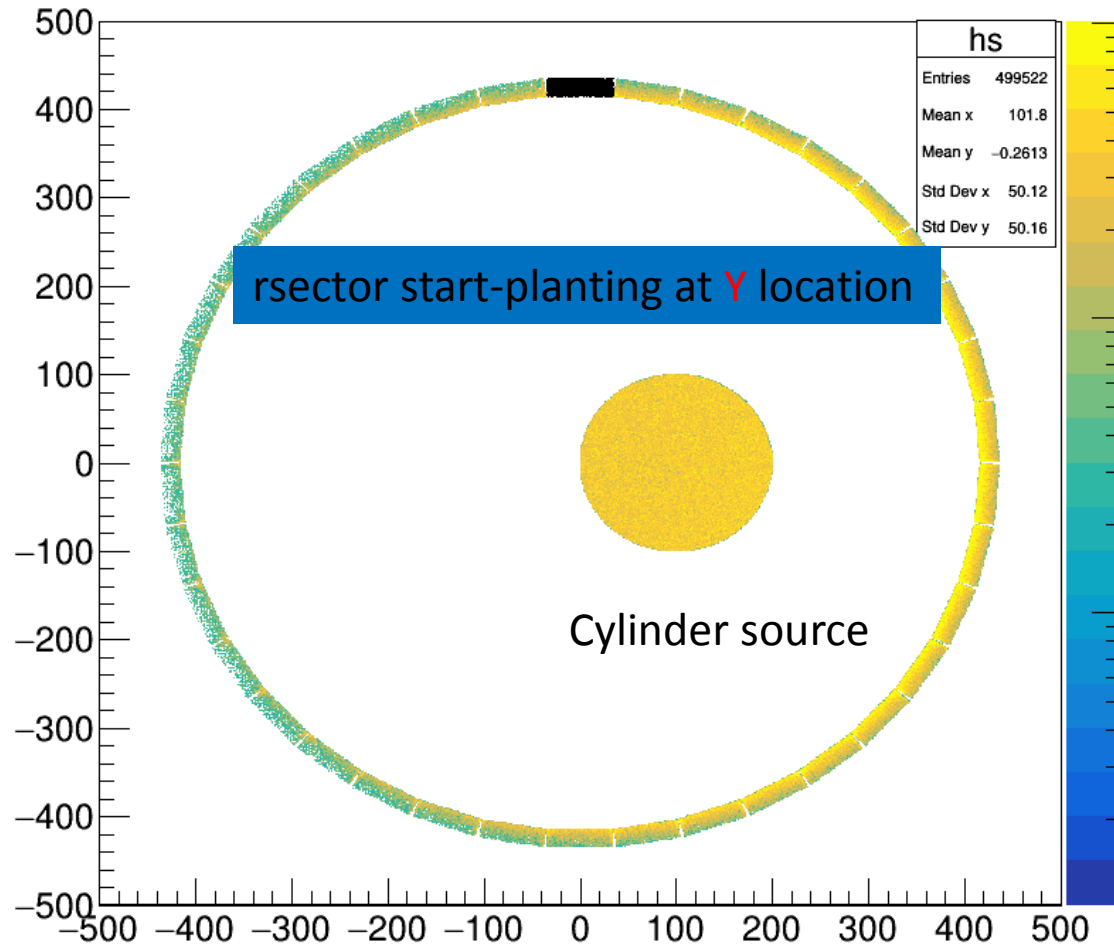


rsector start-planting at Y location



rsector start-planting at X location
rotate span angle 90 degree

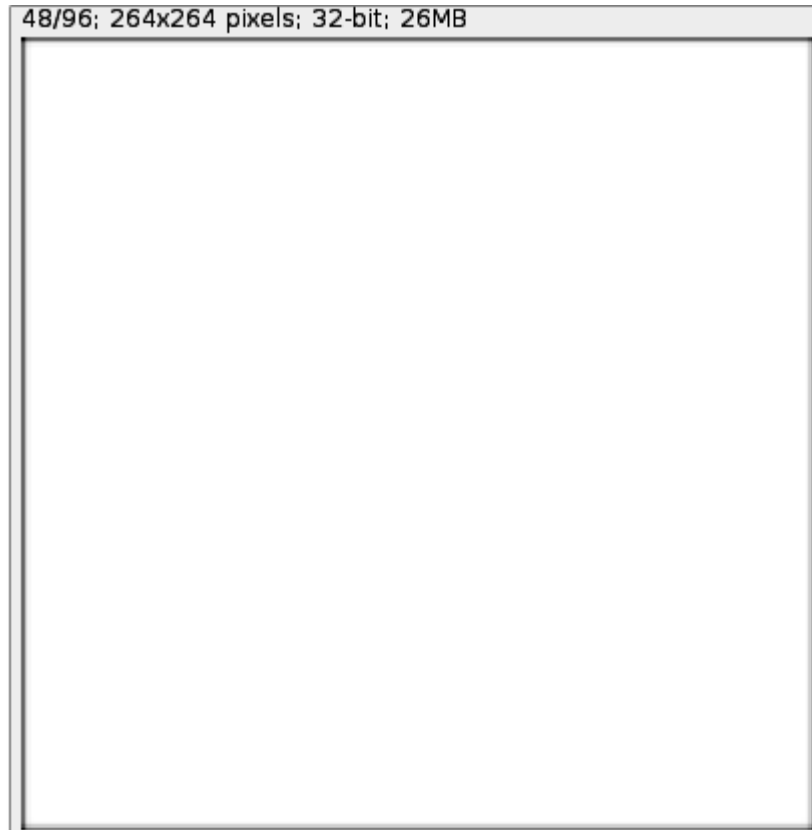
- Same simulation results in GATE



No difference geometry architecture, identical results in GATE simulation !

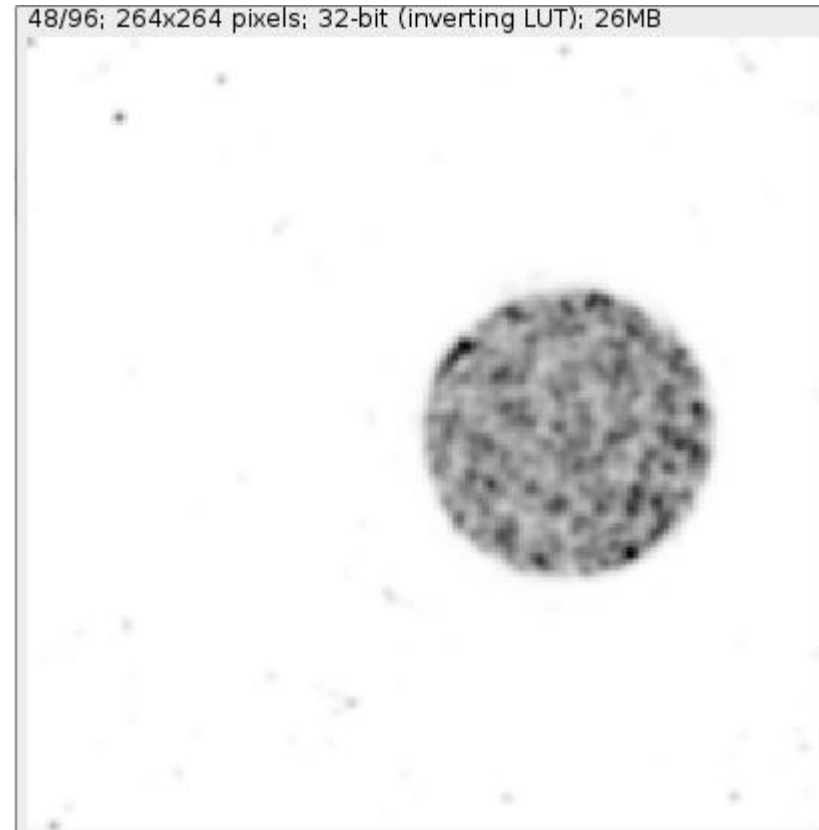
- Different Castor results

rsector start at **Y** location



WRONG

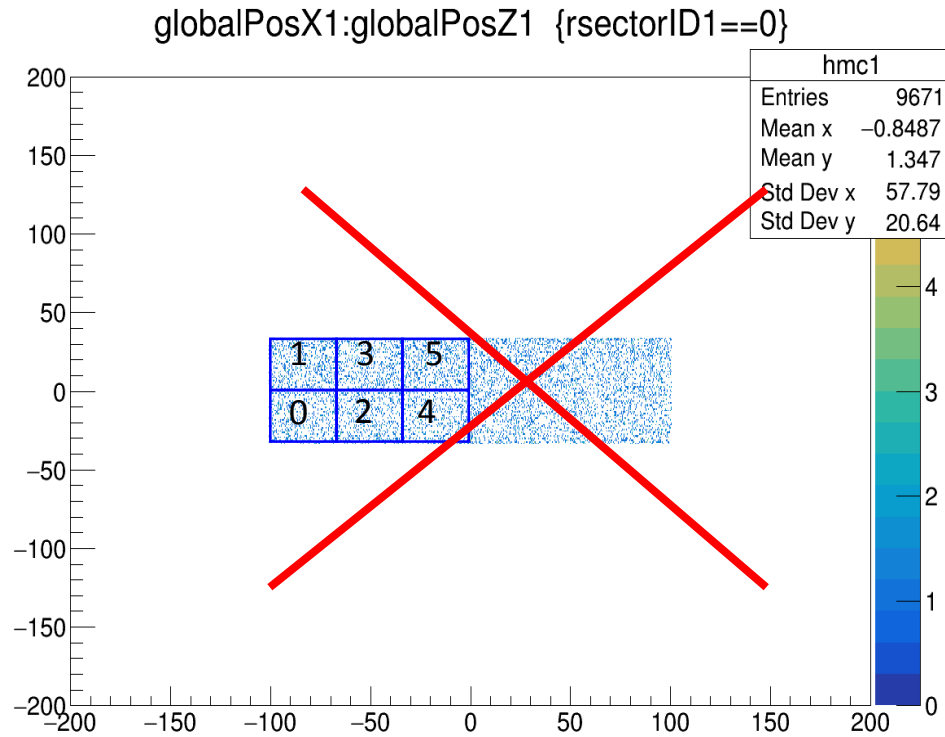
rsector start at **X** location
rotate span angle 90 degree



RIGHT

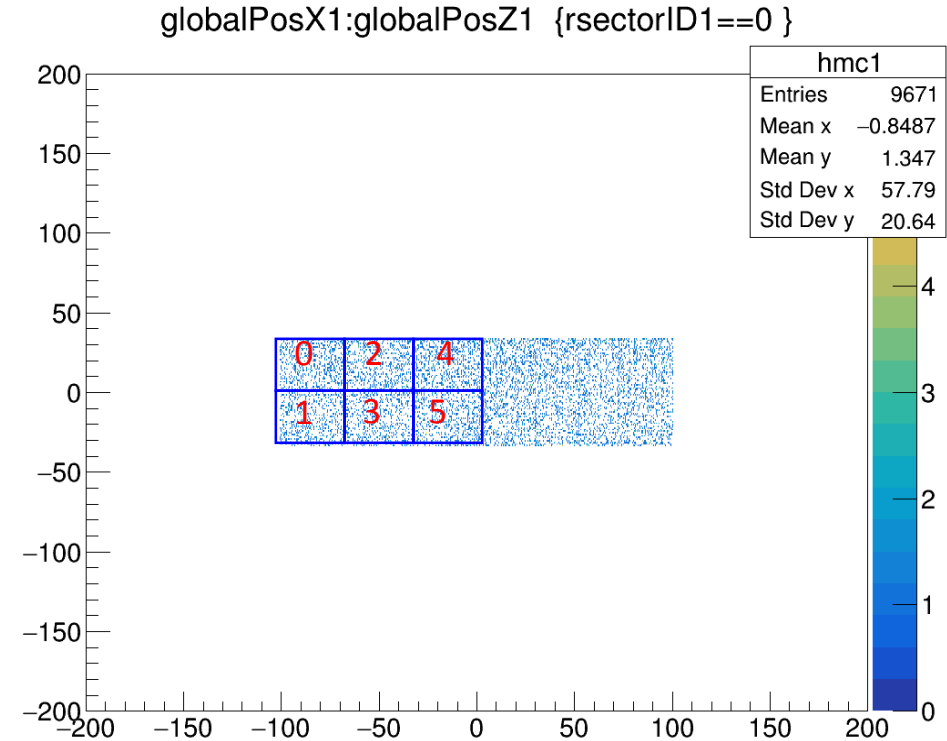
- Check the geometry detail

rsector start at **Y** location



SubmoduleID is different !

rsector start at **X** location
rotate span angle 90 degree



**Different unit ID in these GATE geometry;
Only the right pattern matches with Castor software;**