



# Follow up on SR Simulations

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## SR Spectrum:

- wait for files, including separated last bend+ quad spectra
- cross check last bent spectrum (scoring) -> Helmut's generator (RIP)
- Quad+BM SR requires full last 100m beam line in Geant

## Disk 4

- cosalpha should have opposite sign
- propagate over x not R
- run simulations with vacuum instead of air in the detector volume
- Scoring plane at D4 (RIP)
- trackback (RIP)

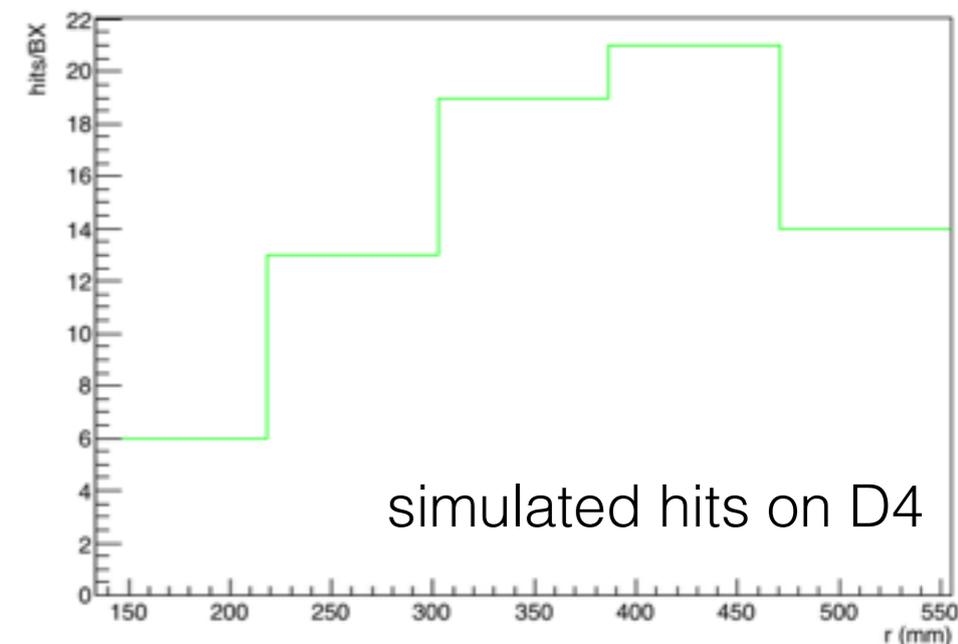
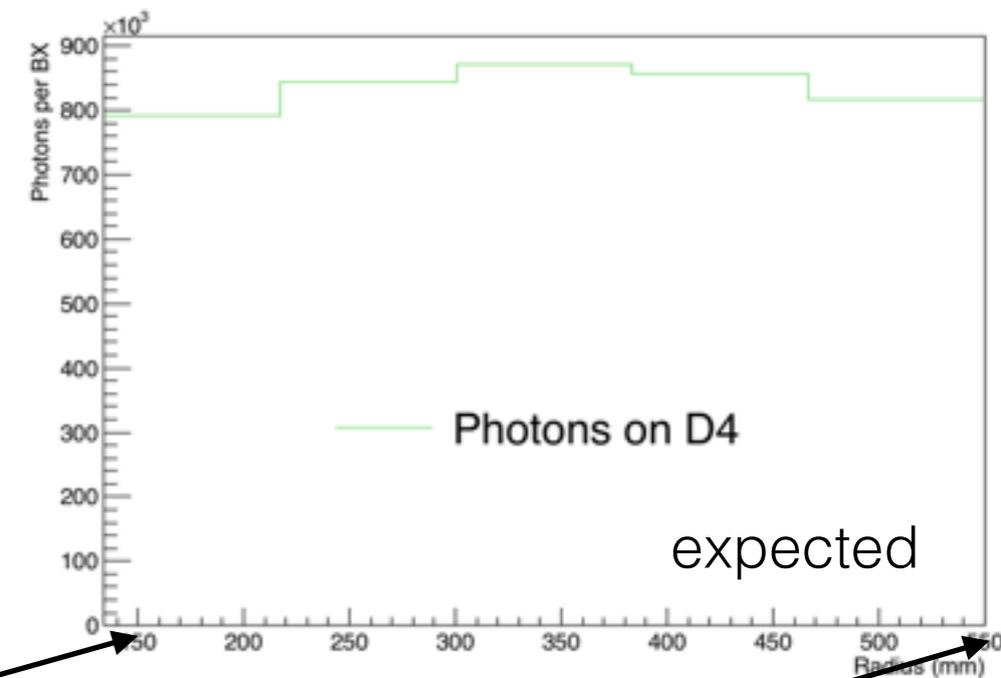
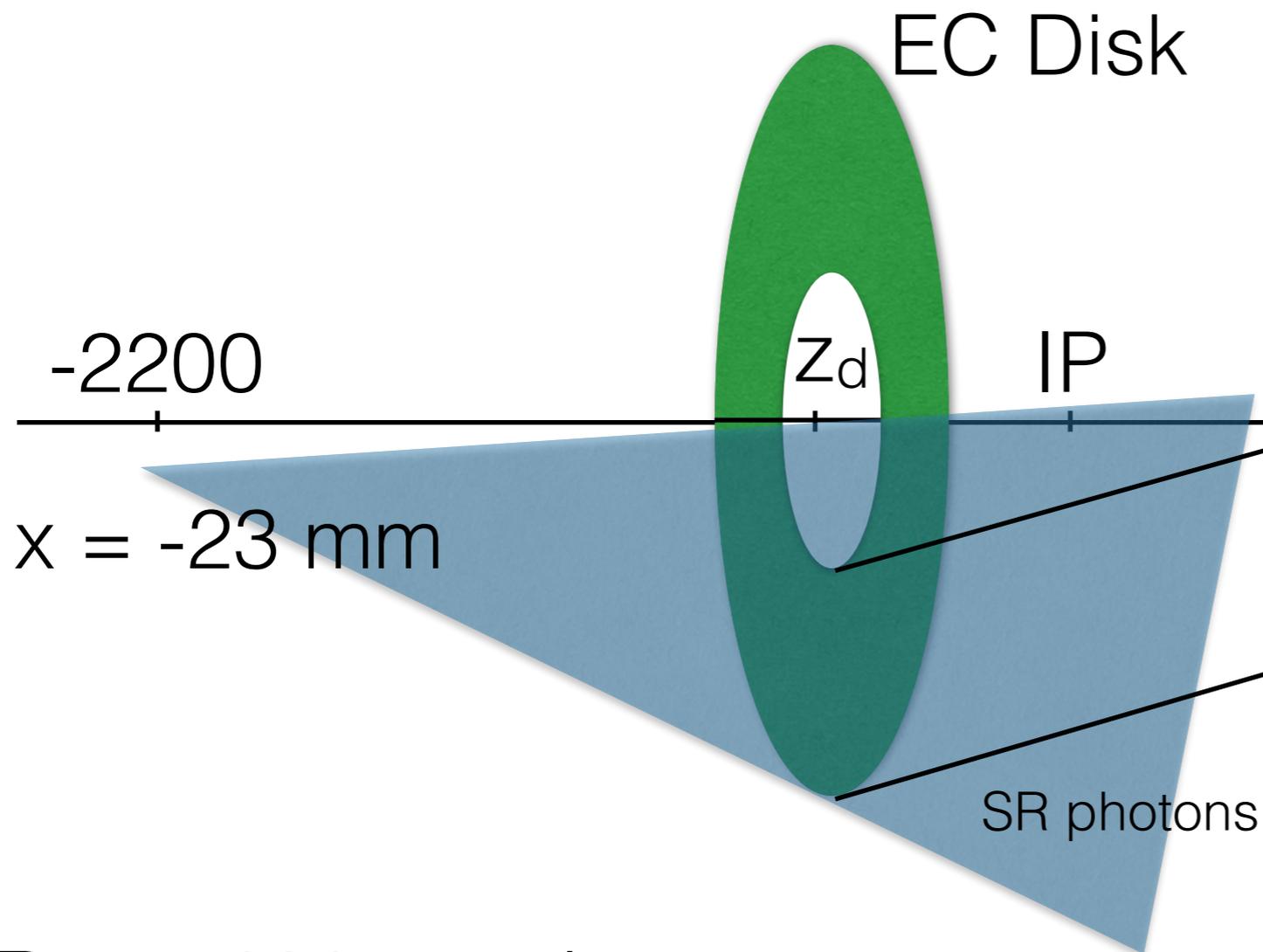
## Scoring planes

- Disk 4, CBP and mask area -> Ictuple merge need fix (RIP)

## The central beam pipe count

- fixed cuts and cosalpha -> check again after Ictuple merge is fixed

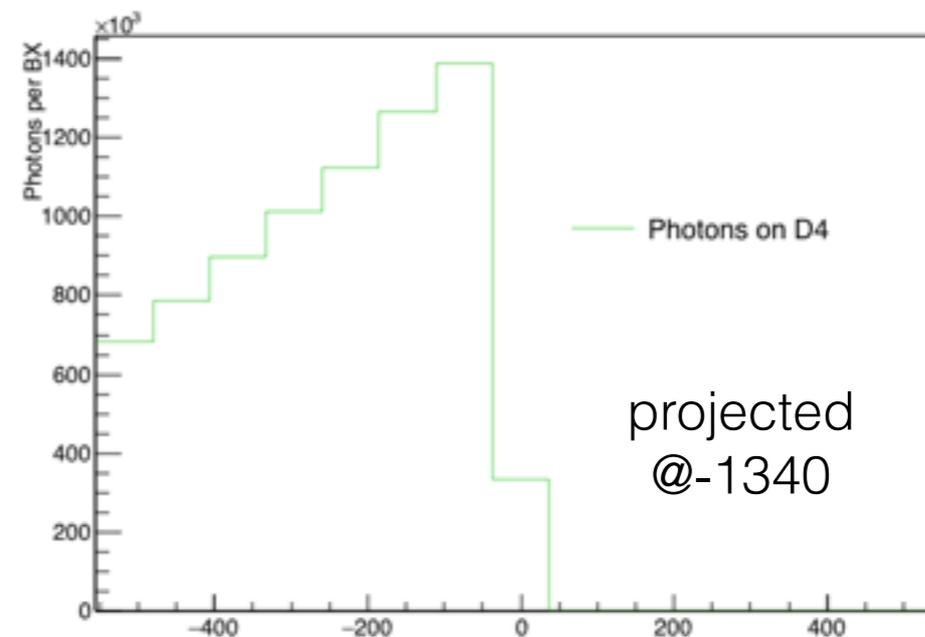
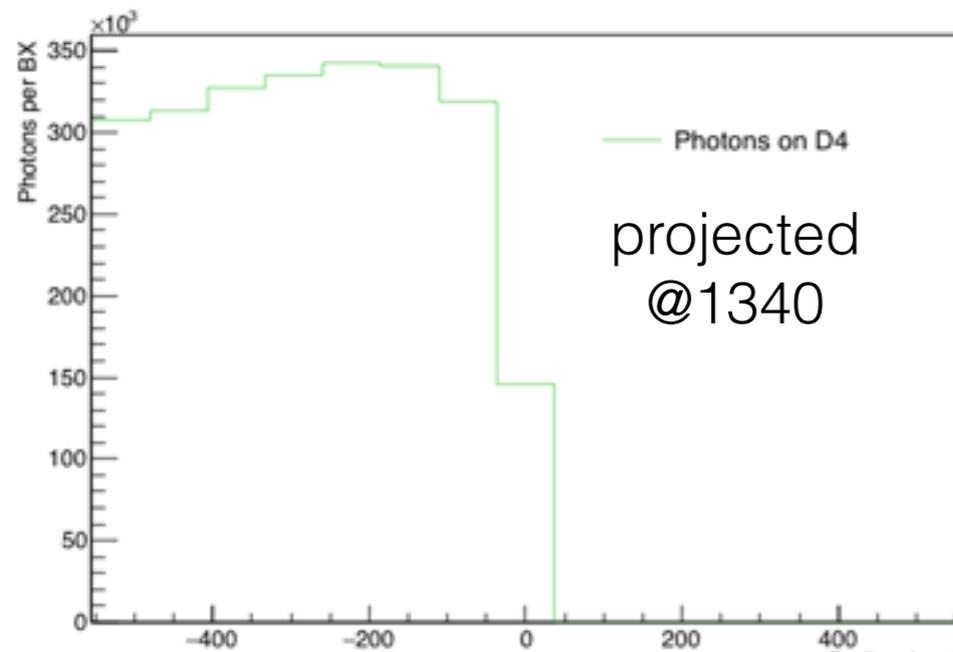
# SR photons on Endcaps



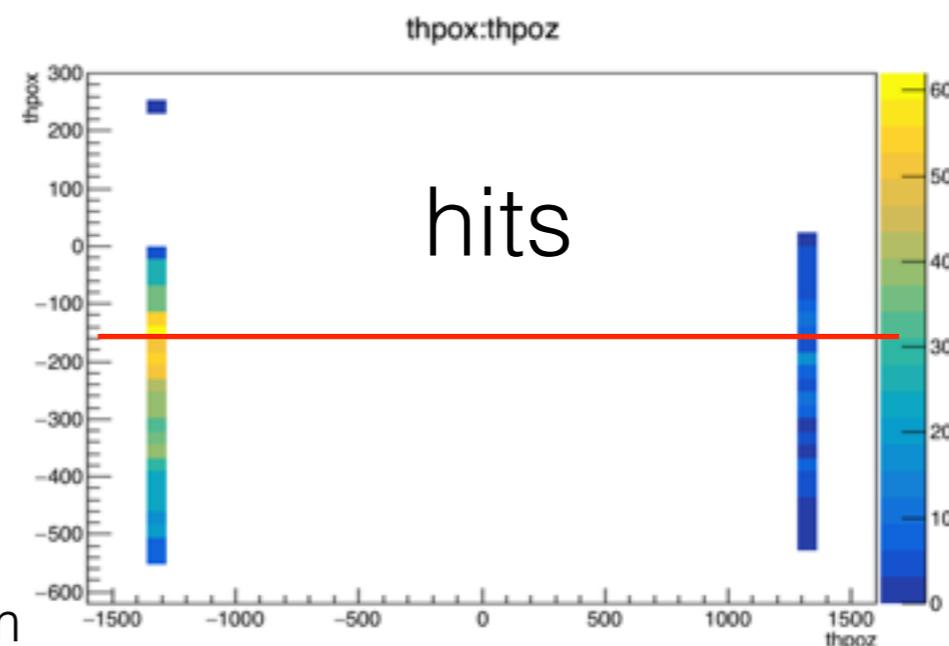
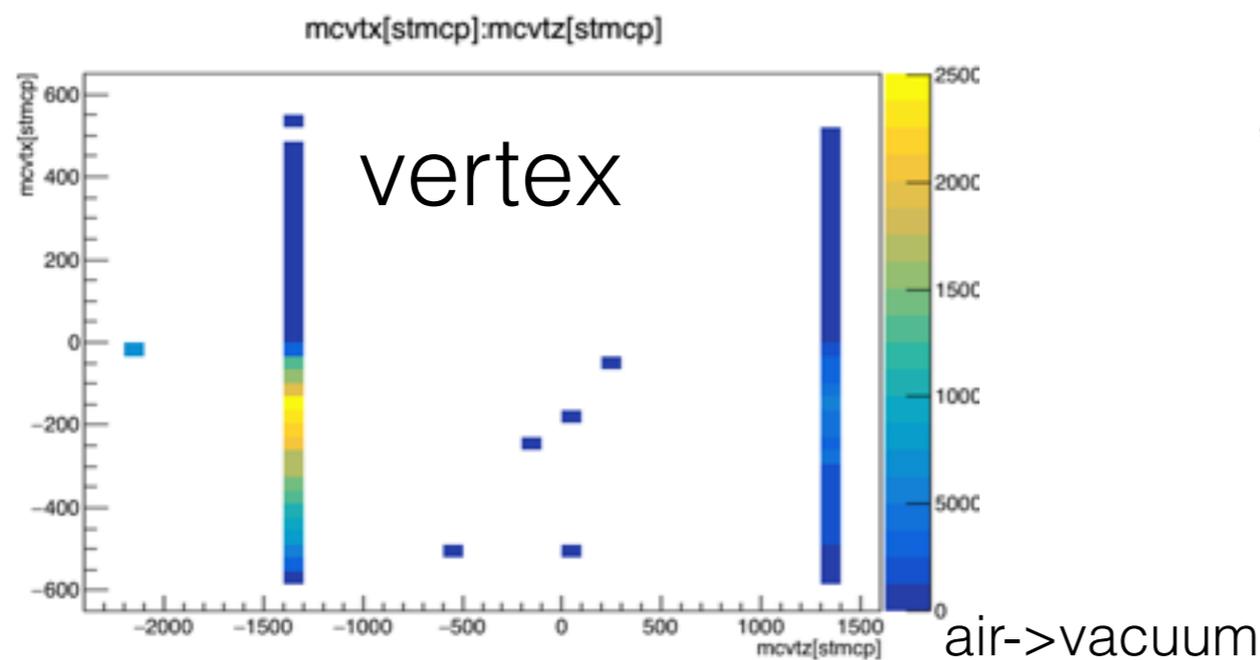
$R_{\min} = 100$  mrad cone

$R_{\max} = 555$  mm (D1 250 mm)

look at x (to do: Check how i did it)



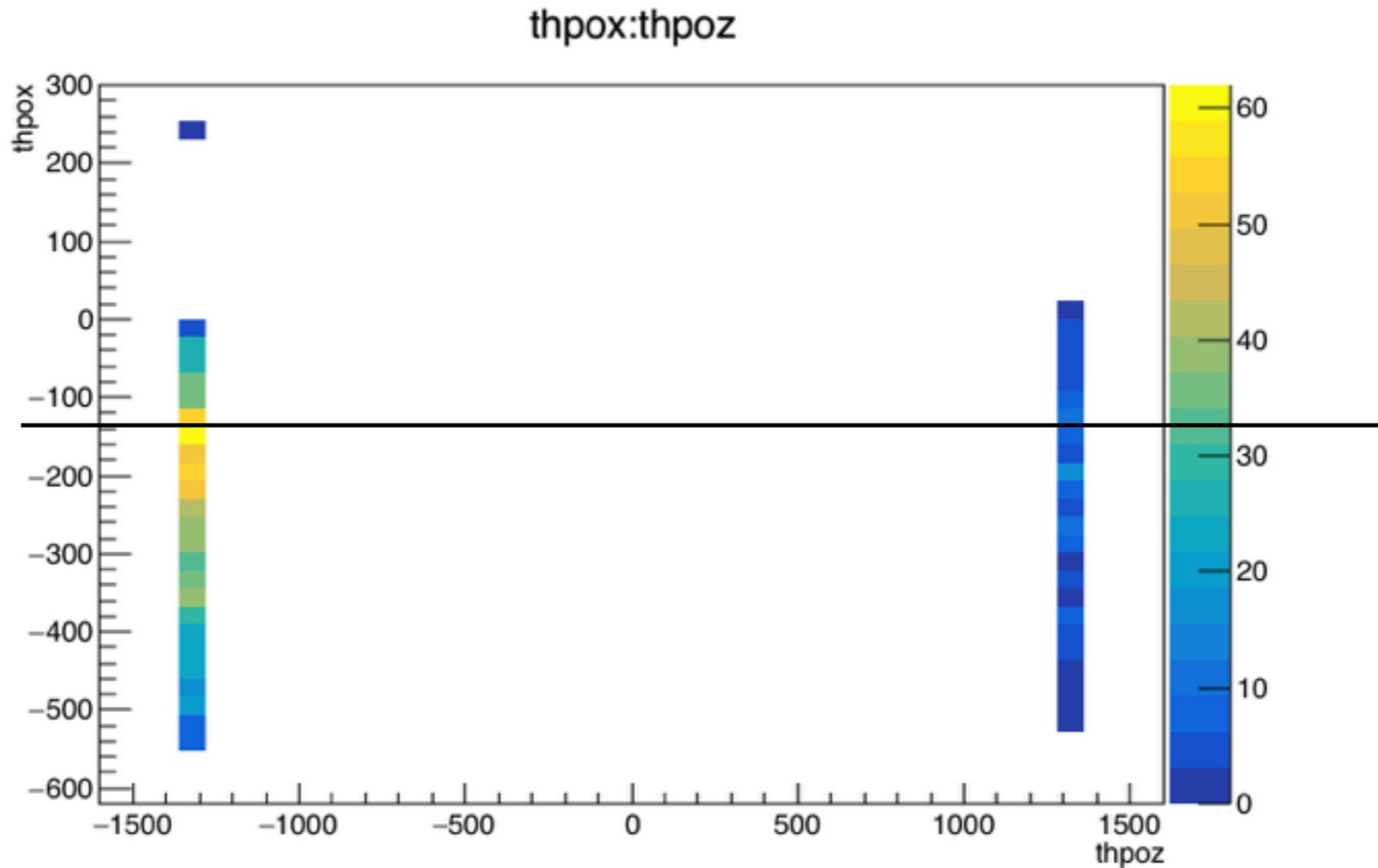
$\cos\alpha < 0$



hits on x -z plane look consistent with projection

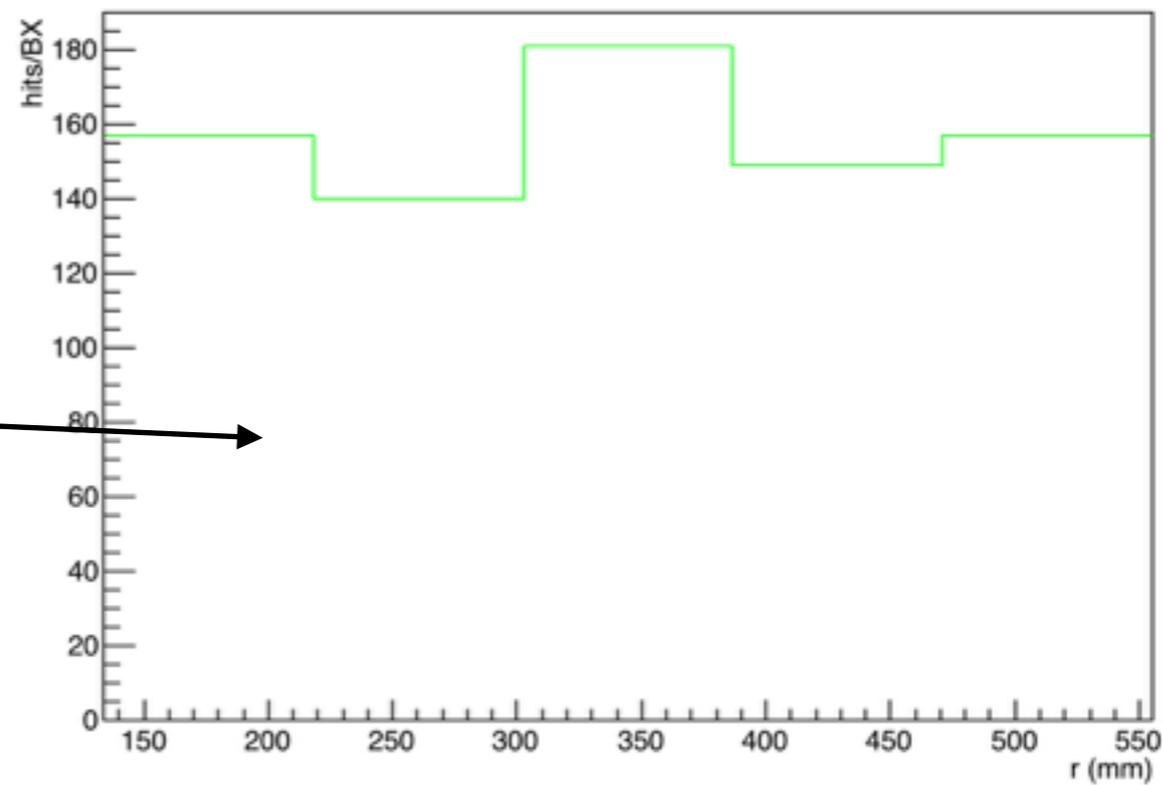
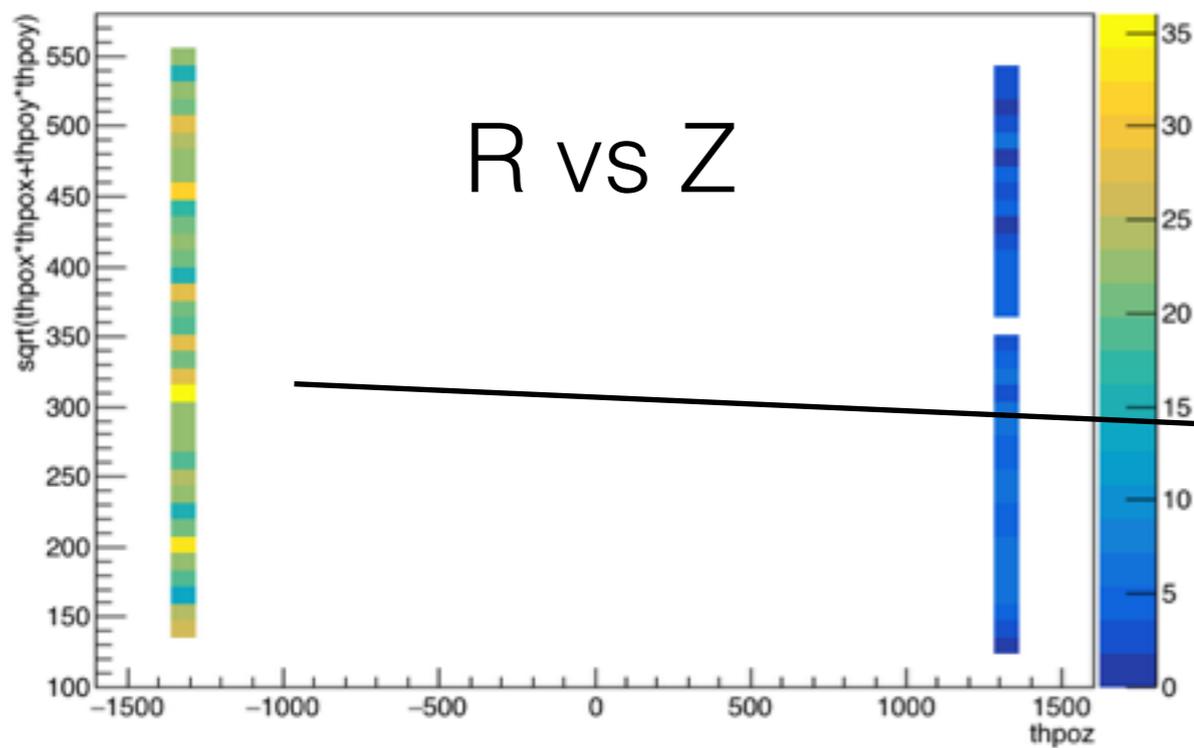
why do i get hits below 134 mm? D4 is supposed to start here

just x projection!



script processing simulated hits needs revisiting

$\sqrt{thpox*thpox+thpoy*thpoy}:thpoz$



Air?!!

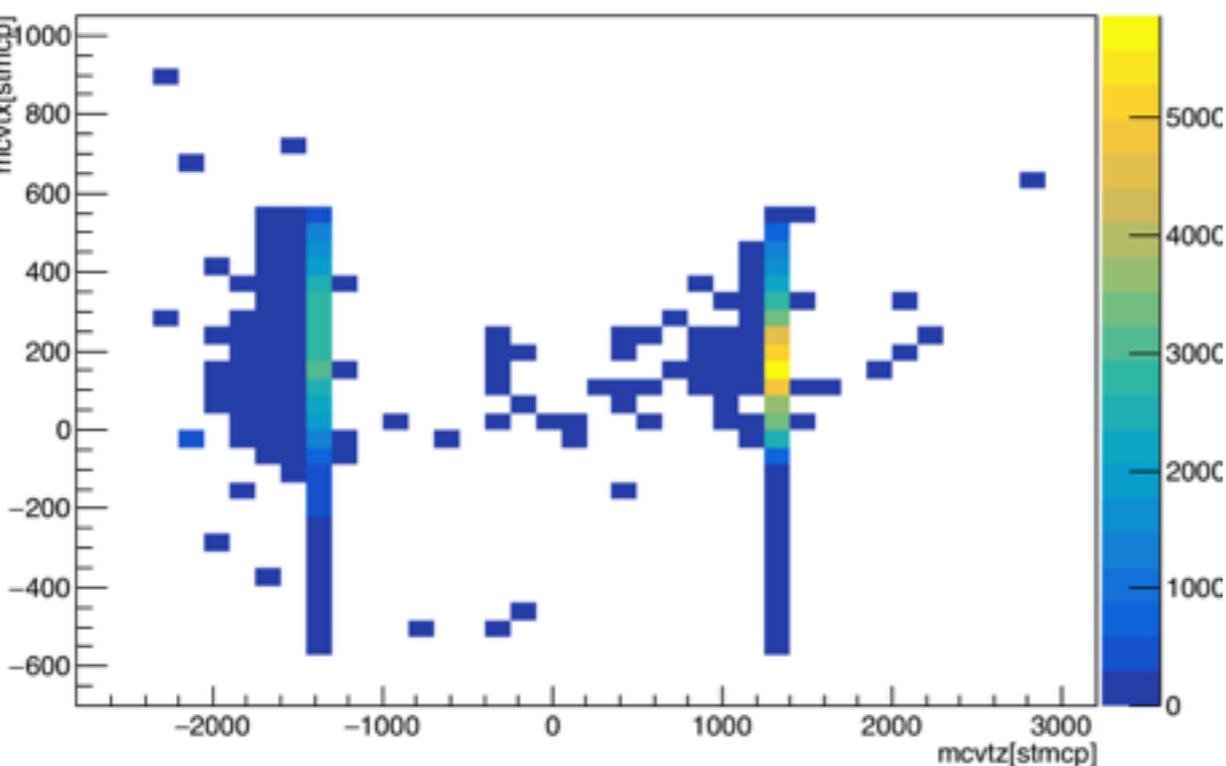
Looking at the initial vertex of montecarlo particle that makes hits in disk 4

## Air vs Vacuum

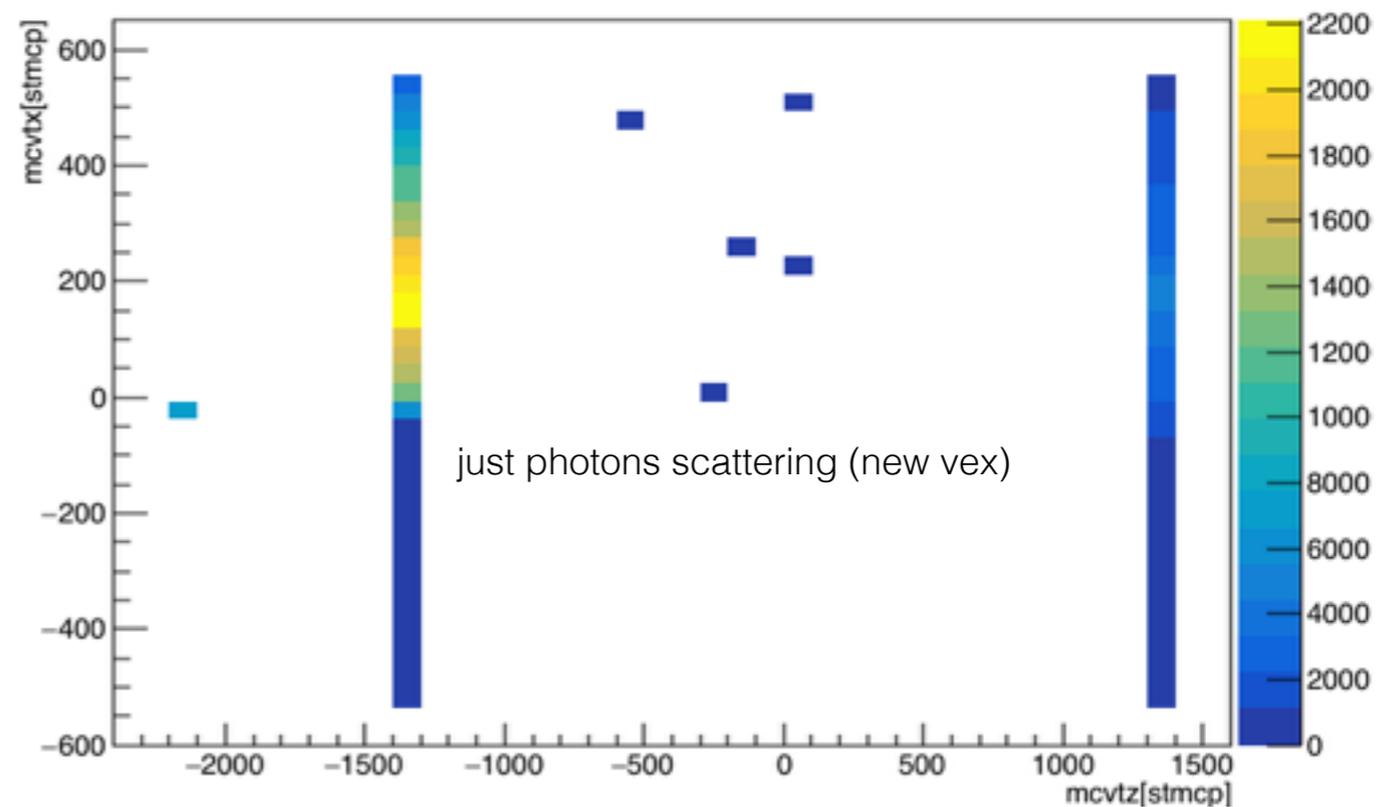
## Hits in D4 937

MS1\_noshield\_nolumi\_Disk4\_No\_pipesCH\_Stat\_Air3.root

`mcvtx[stmcp]:mctz[stmcp] {mcvtx[stmcp]<4000}`

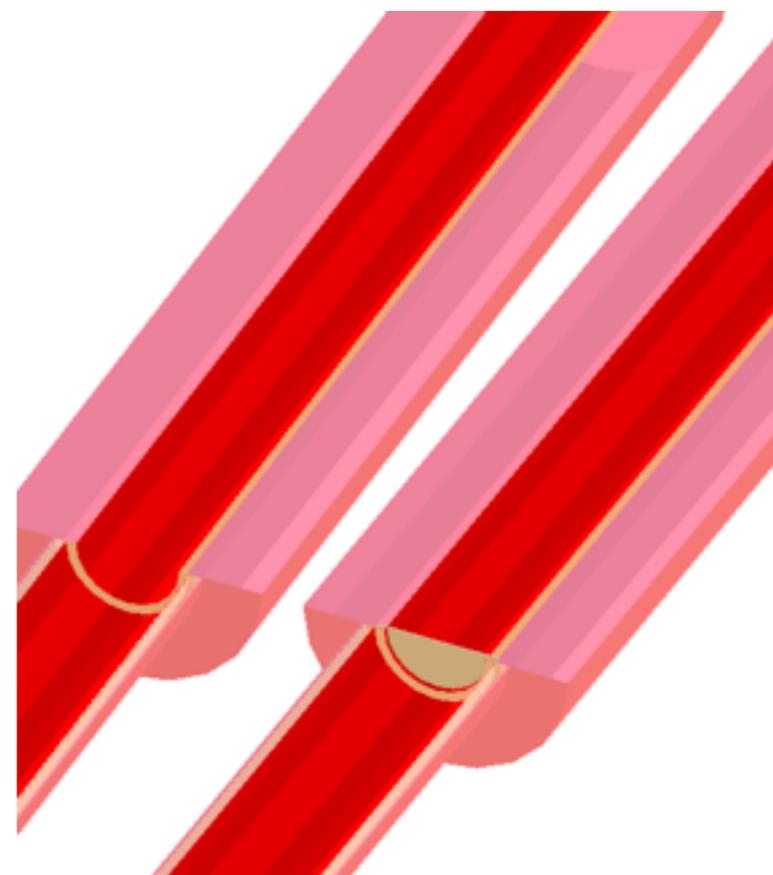
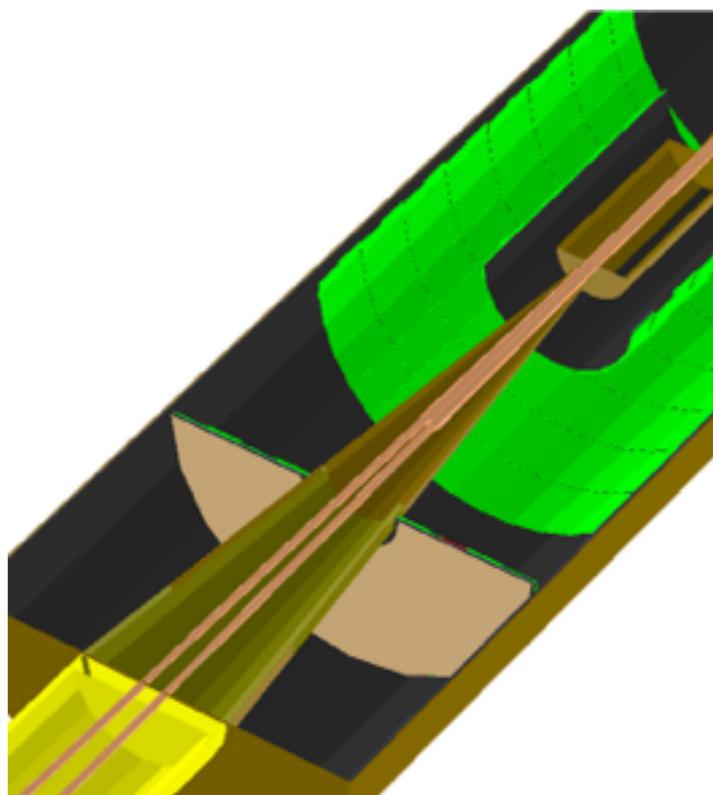


`mcvtx[stmcp]:mctz[stmcp]`



fixed cosalpha

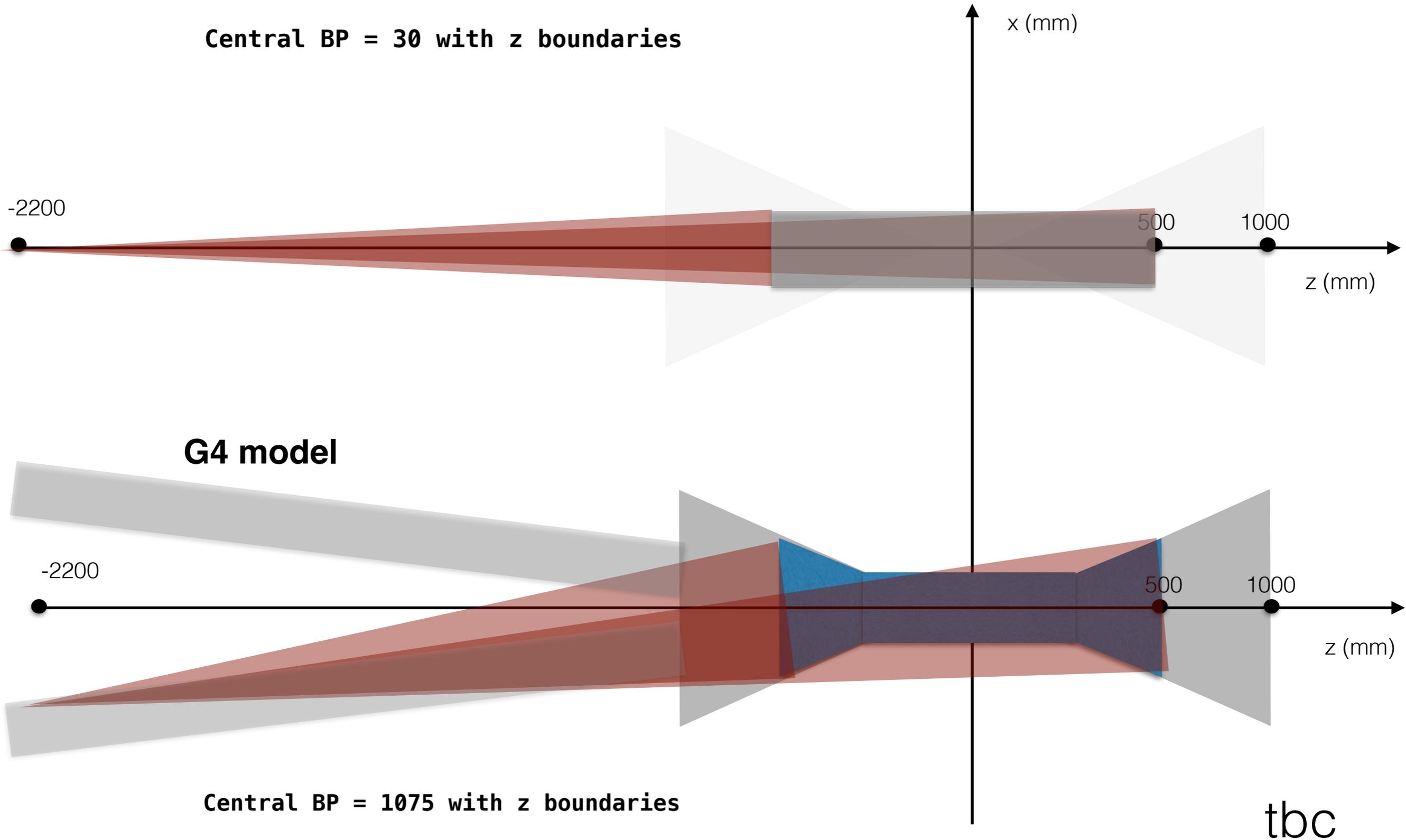
actually a cylinder, not a box, probably not OK!!



BUT at Ictuple level, not working, also when other sensitive layer is added (need to debug)

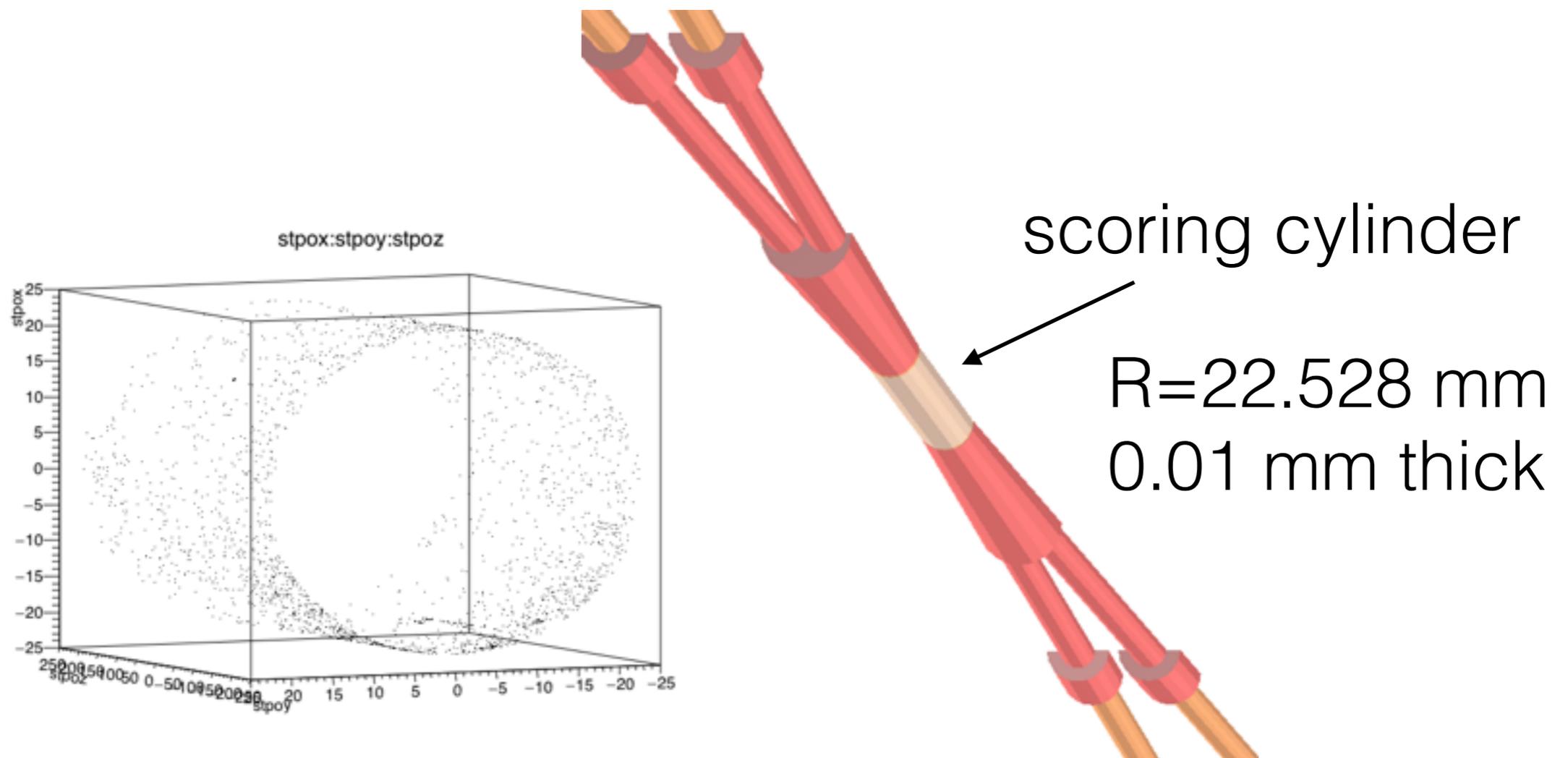
all air set to vac, including scoring plane...

# Comparison of particles going through CBP



redo sim, scoring plane, rmin, rmax+0.01

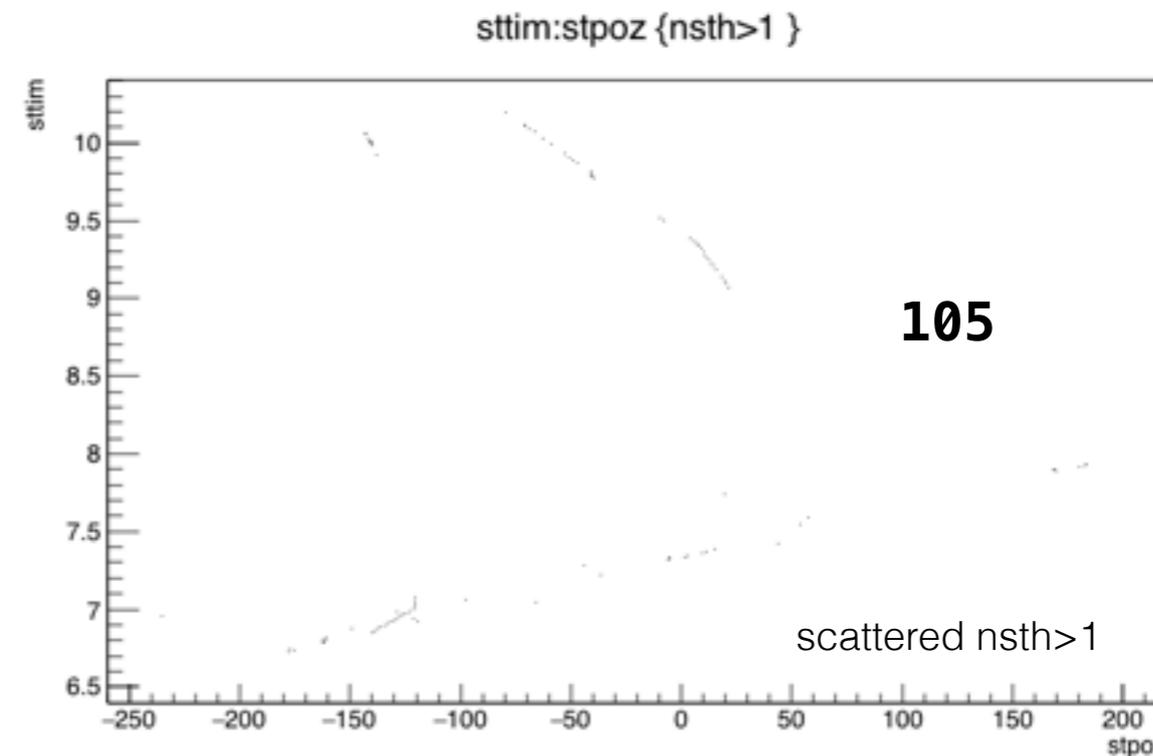
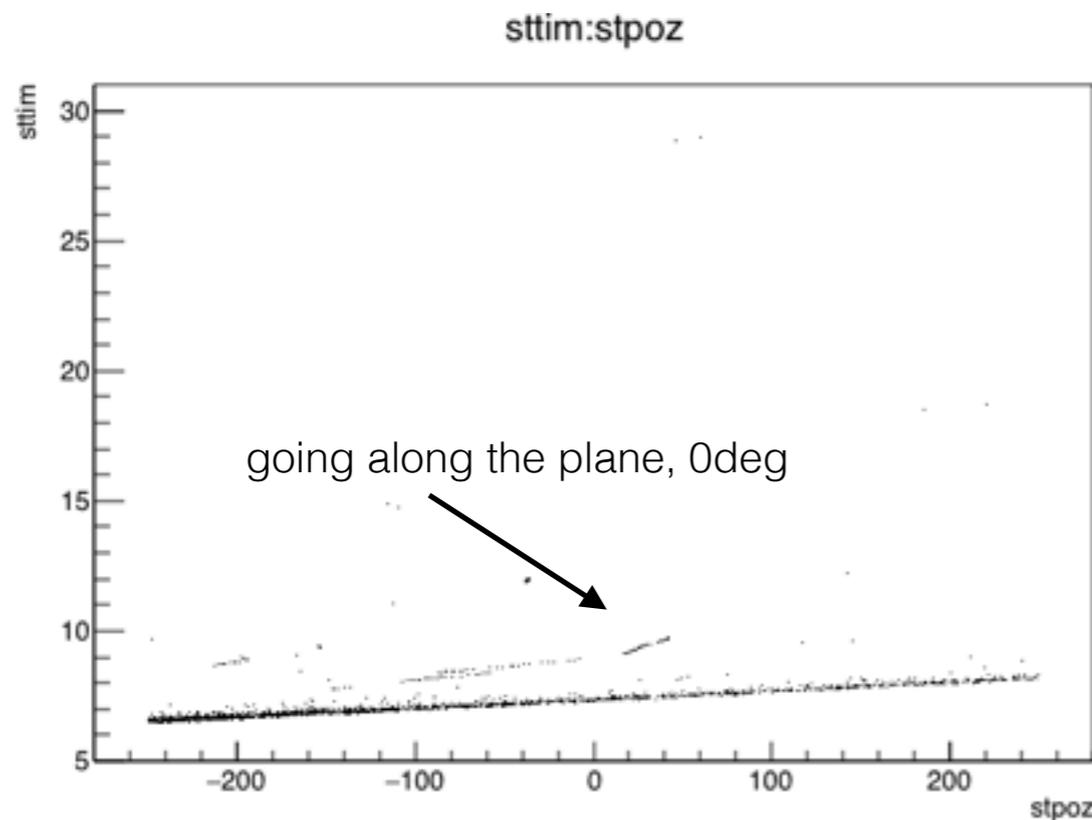
Test\_MikesBeampipe.xml



recorded hits on the cylinder

MS1\_MikesBeampipe\_Scoring\_fixX.root

```
root [36] MyLCTuple->Draw("sttim:stpoz","nsth>1 ")
(Long64_t) 105
```



scoring material: air (would that make a diff if it was sth else? “ghost” hits also apply? only one layer)  
 R=22.538 mm

cut -> (Long64\_t) **2765 (2300 for mcmox<0)**  
 root [30] MyLCTuple->Draw("sttim:stpoz","nsth>0 && nsth<2 && stmcp==0 && sttim<8.5")

previous estimations ~1400 (is “digi” correct?!) )

- Geant4 simulations with generated SR spectrum + quads, comparisons etc (requires full model of the last 100 m in Geant)
- separate quad SR from BM
- Look at different SR source positions
- Optimal Au layer and BP thickness?
- Look at Asymmetric BP IR??
- write it all up