Dear Matt,

As we discussed it will be extremely crucial to test tracking reconstruction performance for the setup with miniTPC in.

Even the “fast” GEANT simulation can be considered as a first step.

We would like to propose to test two setups:

1. First one
2. Si vertex detectors: R position Z length (cm)

3.3 30

5.7 30

21.0 54

22.68 60

( three hits / track)

1. MiniTPC 23.5 – 37.5 100 (cylinder shape)
2. Si detectors 39.5 105

43.3 114

(one hit more)

1. Second one
2. The same as point 1) before
3. miniTPC 25 -- 45 110
4. there is no more Si after.

Plus: 3x2 MPGDs for both options

miniTPC materials: Field Cage: Mylar 1% RL

Cathode (e- end cap): Mylar 0.5%

Read out (h direction): Si 300 µm + 6.5 mm FR4 (G10) = 4% RL

Gas: P10 (for simplicity)

In GEANT simulation prepare in the gas volume cylinder shape

“pad rows” with 0.1 cm “thickness”.

So in 14 cm in R miniTPC option it will 140 sensitive volumes / hits

With coordinates (X,Y) in the center of each volume and Z – as drift

distance to readout side.

On the base the simulation that was done so far each hit should be smearing with the Gaussian sigma: X and Y – 100 µm , Z (drift) – 200 µm.

It includes diffusions (in 3 T B-field) and GridPIx response.

And it is correct for drift distance (35 – 65) cm, and should be a little bit different for bigger and smaller ones. But we will “close eyes” for the moment.

Use hits efficiency as 90%

So for 14 cm miniTPC it can be >125 tracking hits

20 cm >180

Because angles and “tracking” in 3T B-field

If any questions please call me:

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Best regards, Nikolai.