

Progress of CEPC Simulation Tools and Tracking

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Simulation tools--MokkaC

- Mokka Blabla...
- MokkaC
 - Mokka at CEPC or Mokka for collider
- Update
 - GIT server → common Mokka library



At this step, if want to use, download from GIT server or use library at my private directory /workfs/bes/fucd/Mokka/mokka-08-03

Recent Update of Mokka at cepcgit

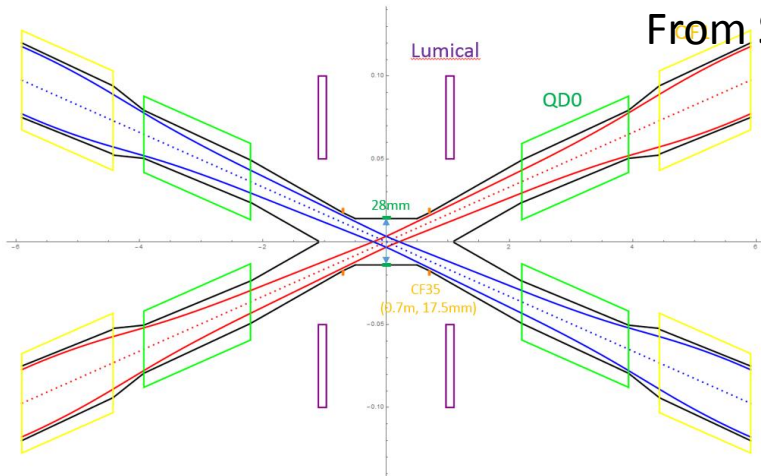
- Support to change database of driver in steering file
 - Previous:
 - /Mokka/init/EditGeometry/addSubDetector tube_cepcc
 - /Mokka/init/EditGeometry/newSubDetector SiTracker01
 - Current:
 - /Mokka/init/EditGeometry/newSubDetector new_tube 150 Tube_cepcc TMP_DB03_33_Cu
- Support scintillator for SHcalRpc01 driver
 - /Mokka/init/globalModelParameter Hcal_sensitive_model scintillator
 - /Mokka/init/globalModelParameter Hcal_scintillator_thickness 3
 - /Mokka/init/globalModelParameter Hcal_steel_cassette_thickness 0.5
 - /Mokka/init/globalModelParameter Hcal_Cu_thickness 0.1
 - /Mokka/init/globalModelParameter Hcal_PCB_thickness 0.7
- Add optional parameters for VXD (scale of thickness) through steering file
 - /Mokka/init/globalModelParameter VXDSupportScale 2
 - /Mokka/init/globalModelParameter VXDSiliconScale 1
- Add optional parameters for Yoke (layer number and thickness) through steering file
 - /Mokka/init/globalModelParameter YokeUserLayer 1
 - /Mokka/init/globalModelParameter YokeGapThickness 25
 - /Mokka/init/globalModelParameter YokeIronThickness 100
 - /Mokka/init/globalModelParameter YokeLayerNumber 12
 - /Mokka/init/globalModelParameter YokeBarrelEndcapGap 5
- Correct FTD Gear output for radiation length of support: not affect on reconstruction now!

```
rInner="4.000000000e+01" radLength="9.366070445e+01" />  
" rInner="4.000000000e+01" radLength="9.366070445e+01" />
```

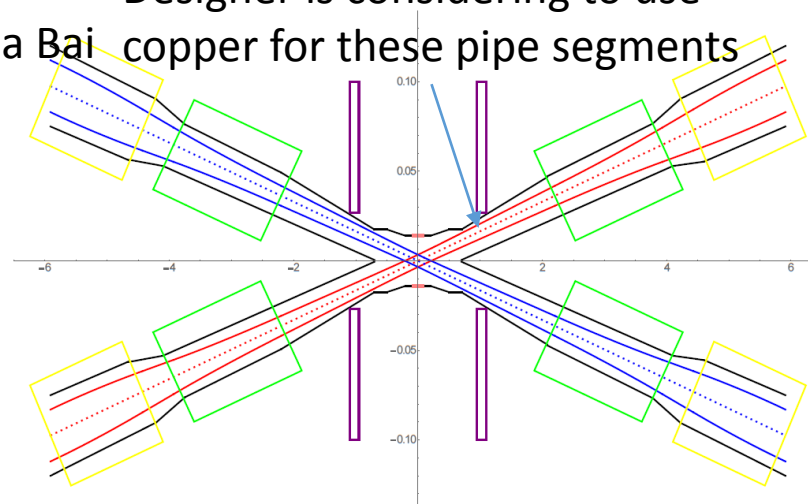
```
950000000e+01" radLength="2.860837413e+02" />  
1.950000000e+01" radLength="9.366070445e+01" />
```

MDI in CEPC_v4

- There are two version of MDI with crossing angle now
 - First doubly-pipe: default in CEPC_v4
 - Sep.26



Designer is considering to use From Sha Bai copper for these pipe segments



- How to use newer MDI
 - /Mokka/init/EditGeometry/newSubDetector new_tube 150 Tube_cepc TMP_DB03_33_Cu
 - /Mokka/init/EditGeometry/newSubDetector new_tube 150 Tube_cepc TMP_DB03_33 for aluminum
- Plan:
 - support to change materials of Be-pipe: composited structure (Be+X1+X2+...)

Current Problem

- For MarlinTrkTracks, their transverse momentums are a little deviated from the real values.
- Possible reason: material in Kalman fit?
 - The materials are fixed in codes now, not following Gear file. Some materials are different.
 - TPC?
 - In the history of codes, there are also modification on the radiation length, but no reason, so need more test

```

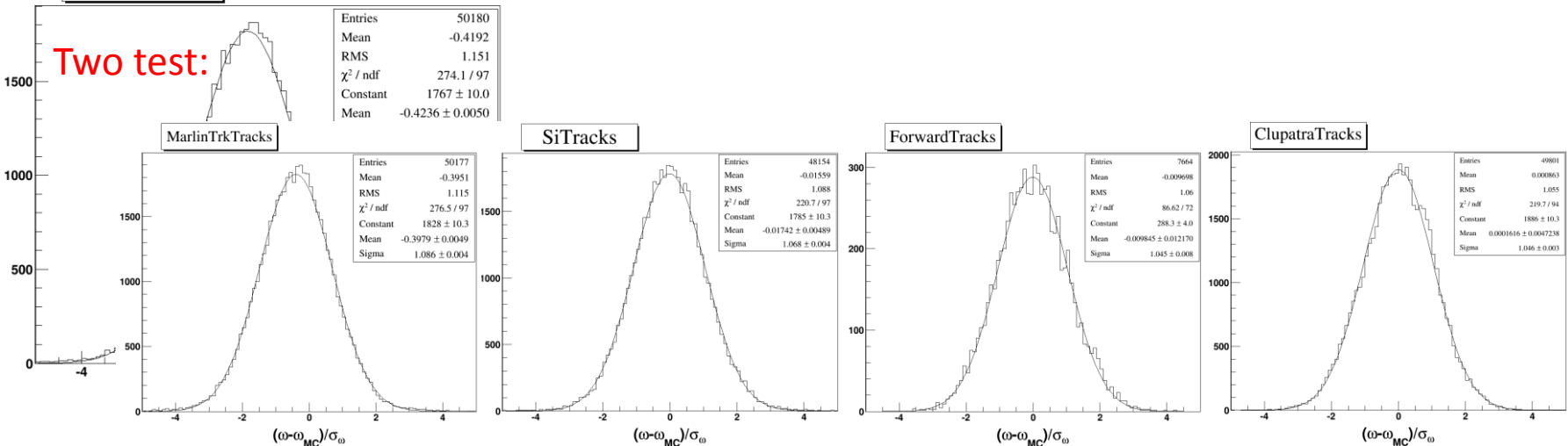
density 1.719e-3 ;
// radlen = 1.196e4*2;
Current value //radlen = 0.5*1.196e4*2; // SJA:FIXME: reduce by a factor of 10%
radlen = 1.15520546e4*0.9; //fucd
name = "tpcgas" ;
    
```

1.1552 is Right value

- So, plan:
 - Fix this problem
 - To set the radiation length of materials in Kalman fit through Gear file.

MarlinTrkTracks

Two test:



News: ConformalTracking

- A tracking package for silicon detector, transplanted from <https://github.com/iLCSoft/ConformalTracking>, used at CLIC and FCC-ee
- Very hopeful at CEPC, current status
 - Workable for most events, but crash at some special event, debugging
 - Performance seems ok on a quick look, and more check are processing

Thanks!