

# CEPC-ACTS meeting

2019-9-2

- Two detector prototypes
  - OpenDataDetector - a full-tails silicon detector
  - Demonstrator – a very simple one-layer detector for demonstration
- Material Mapping
  - Mapping material onto surface
- TPC implementation (for cepc)
  - Simplified version

# OpenDataDetector

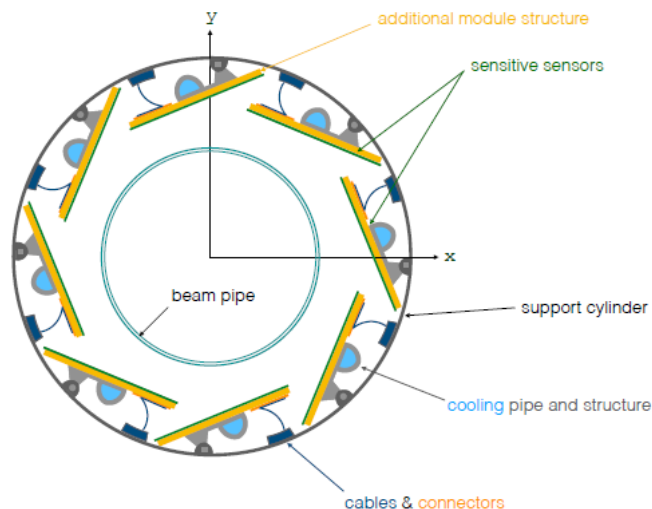
- DDHEP detector
- Silicon : Pixel + shortStrip + longStrip
- Realistic material budget (in xml file)

```
<layer id="0" name="PixelLayer0" rmin="28.*mm" r="34.*mm" rmax="44.*mm" outer_z="20.*mm" nphi="16" phi_tilt="0.12" phi0="0." visible">  
<layer_material inner="false" representing="false" outer="true" binsPhi="1" binsZ="100"/>
```

- Detailed Support structure && cooling pipes
- Available for geometry construct and material mapping
- Available for geant4 plugin - next

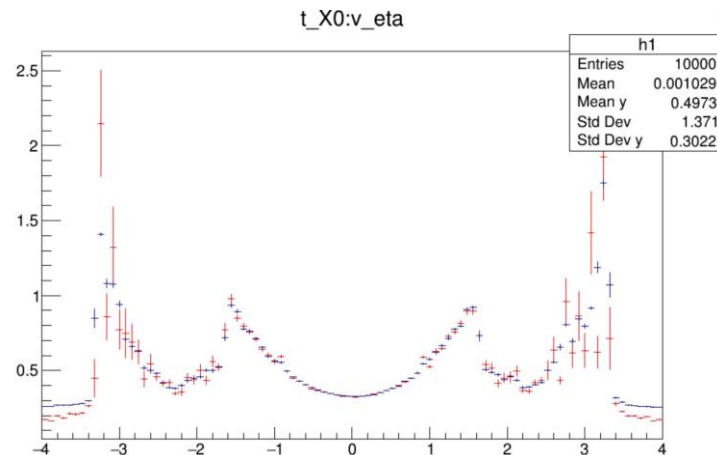
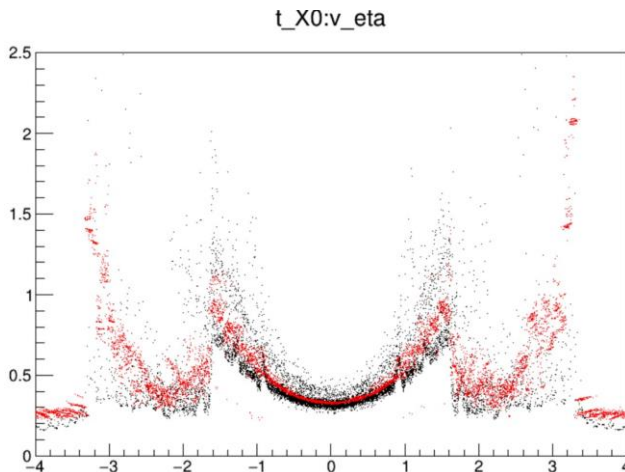
# Demonstrator (1-layer detector)

- To demonstrate concept in ACTS
- Only beampipe + 1-layer
- Very good example to get into DD4HEP and ACTS geometry constructor



# Material Mapping

- GeantinoRecording : use Geant4 to record the material
- Material mapping : map material onto ACTS geometry
- Material validation : original material and acts material comparison



# ACTS status for the detector

- Finish material mapping (map material to boundary surface)
- Validations for the ODD detector
- Geant4 plugins
- Validation for Geant4 and FATRAS

# CEPC TPC status

- Geometry – 220 layer based
- FATRAS – smear – propagation – Kalman filter
- Digitization – we jump this part
- Details on Yubo's report

## CEPC v1

✓ Simple Silicon

✓ Simple TPC

- Fix bugs – reset the FTD sector size, but other details not fully understood
  - I prefer this should be done after refactoring

❑ Full silicon tracker alternative

- Refactor our current detector *This is ready for us to proceed...*
  - Put material and details on – take ODD as a reference

### From last meeting

CEPC-ACTS detector (V1) inner tracker

- Fix bugs in V0
- Add TPC detector
- Add full silicon tracker as an alternative
- Add some material -> apply material mapping

Full silicon version – *not difficult*

TPC – first try *a simple surface-based version*

Material mapping : will release soon

For this step, we can gain full experiences from the [OpenDataDetector](#)



# A little more perspective view for CEPC...

- Full knowledge in ACTS-geometry construction
- Inner Detector validations
  - The tracking geometry should put in a right way (navigation and sensitive view)
  - The material should put correct (material validation)
  - Tuning FATRAS to Geant4 (e.g. record the energy loss)
  - Kalman filter should be correct

