CEPC-ACTS meeting

2019-12-1

CEPC		label	goal	instruction	rate
(1)TPC	Digitization	Not necessary			Hard
	Validation	urgent	Fatras/propagation/Kalman filtering available	Examples in acts-framework	Hard(3~4 weeks)
	Material	necessary	Necessary material	ATLAS TRT	Mid(2~3 weeks)
(2)Silicon(w/o TPC)	Include details	urgent	Infrastructure with (simplified structure)	OpenDataDetector	Hard(3~4weeks)
	Material mapping	urgent	Map proto material onto geometry	Run several commands	Easy(1week)
	Validation	urgent	Fatras/propagation/Kalman filtering available	Examples in acts-framework	Hard(3~4weeks)
(3)FSD	Building Geometry	Necessary/not urgent		OpenDataDetector/(2)	Mid(3weeks)
(4)Geant4 plugin		urgent	Available for G4 simulation		Not implied in ACTS
(5)FATRAS	Tuning	necessary	Validated Compared to G4 simulation		Hard(4 weeks)
(6)Carlo		necessary	Next step		Geometry building/ propagator

CEPC		label	goal	instruction	Status
(1)TPC	Digitization	Not necessary			(0%)
	Validation	urgent	Fatras/propagation/Kalman filtering available	Examples in acts-framework	Propagation – 50% (bug in sensitive) Fatras - Ok **Kalman – WIP**
	Material	necessary	Necessary material	ATLAS TRT	(0%)
(2)Silicon(w/o TPC)	Include details	urgent	Infrastructure with (simplified structure)	OpenDataDetector	Details – 50%
	Material mapping	urgent	Map proto material onto geometry	Run several commands	50% (mechanic works, but details should be checked)
	Validation	urgent	Fatras/propagation/Kalman filtering available	Examples in acts-framework	Propagation – Ok Fatras – Ok **Kalman -WIP**
(3)FSD	Building Geometry	Necessary/not urgent		OpenDataDetector/ (2)	80% Need to check the geometry
(4)Geant4 plugin		urgent	Available for G4 simulation		
(5)FATRAS	Tuning	necessary	Validated Compared to G4 simulation		
(6)Carlo		necessary	Next step		

1st paper

- Focus on the ACTS concept and geometry building
- status - A very *naïve* outline

Title(This is a sketch of which part with its proportion to be included in the paper)

AA [1,2]

Received: date / Accepted: date

Abstract **Keywords** CEPC, Tracking, ACTS

1 Introduction(15%)

paragraph 1.
(1) particle reconstruction and detector concept
(2)The performance and speed are most important. Both performance and speed should be considered.

paragraph 2.
(1)CEPC physics and detector prototype, we are on the working on TDR study.
(2) requirement of tracking software for long term study.
(3)Tool - layout optimization and material budget.

paragraph 3.
Why ACTS:
(1)migrated from ATLAS, valided in LHC date.
(2) modern code design
(3) flexible of geometry + it's a powerful toolkit to study detector

2 ACTS concept and layout(30%)

ACTS is experiment-independent and framework-

3 CEPC integration(50%)

3.1 Geometry(25%)

DD4HEP implementation : DD4HEP and ACTS extension strategy (How should we use and benefit)
(1)Silicon implementation
(2)TPC implementation

3.2 Validations(25%)

Many figures and descriptions in this part
(1)propagation (show sensitive detectors)
(2*)material mapping (not included if bugs not fixed)
(3)fatras
(4)kalman filter

4 Summary

(5%)

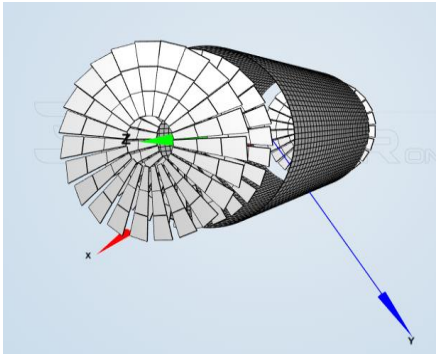
Acknowledgements

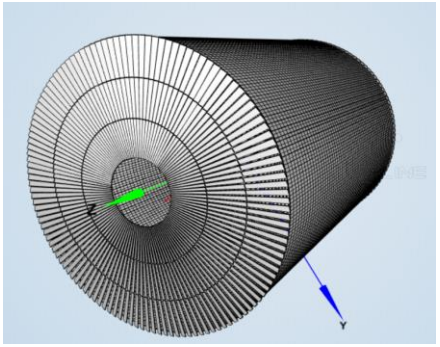
Material needed in this paper – baseline

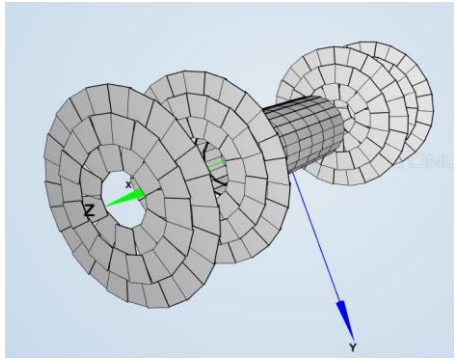
- Geometry
  - ✓From the baseline detector
- Propagation
  - ✓Silicon
  - TPC (bug in sensitive showing)
- Material Mapping
  - Silicon – mechanism work, not fully correct
  - ☐TPC
- Kalman filter (predict + filter) check
  - Work in progress

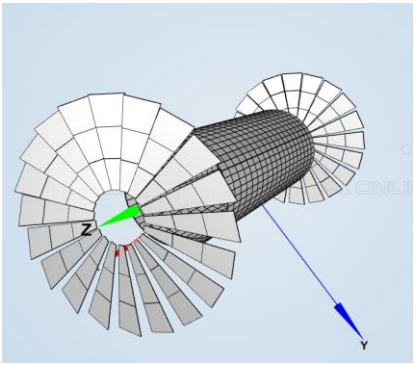
Geometry(Silicon Tracker)

The obj view looks not bad



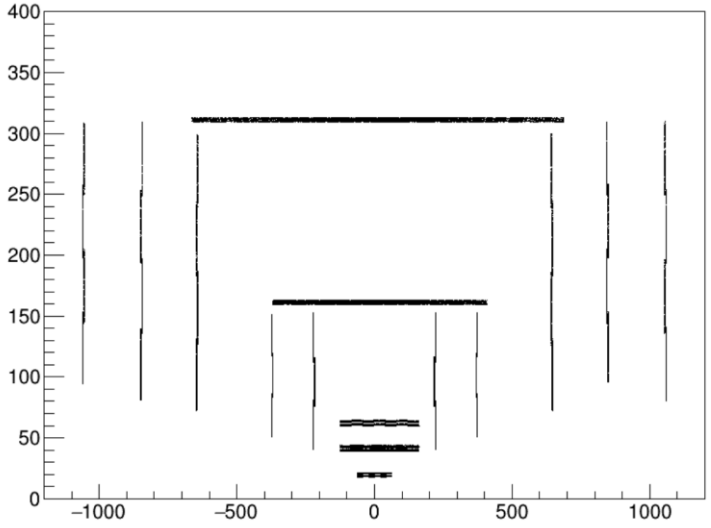


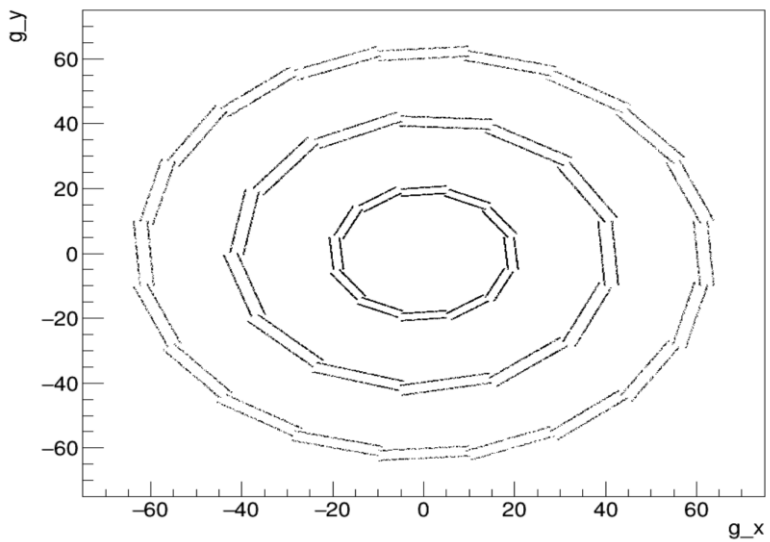




Propagation

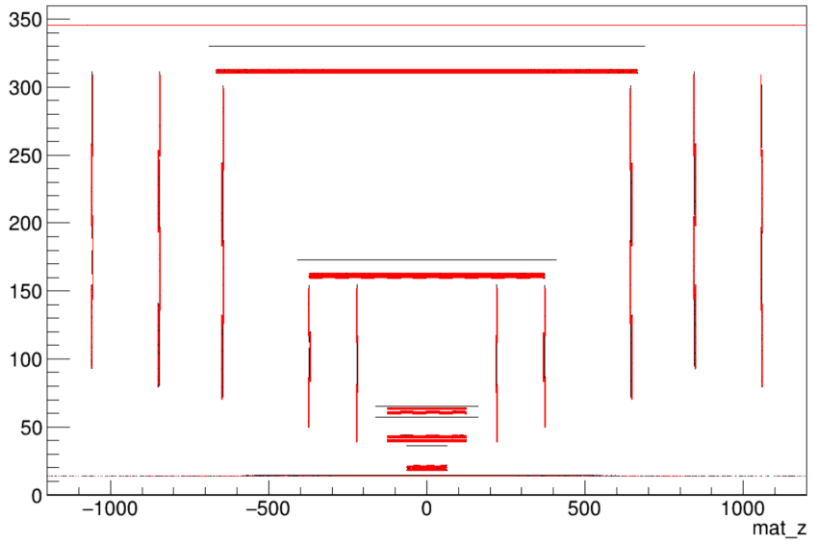
- Sensitive correct with Silicon
- But some trouble with TPC

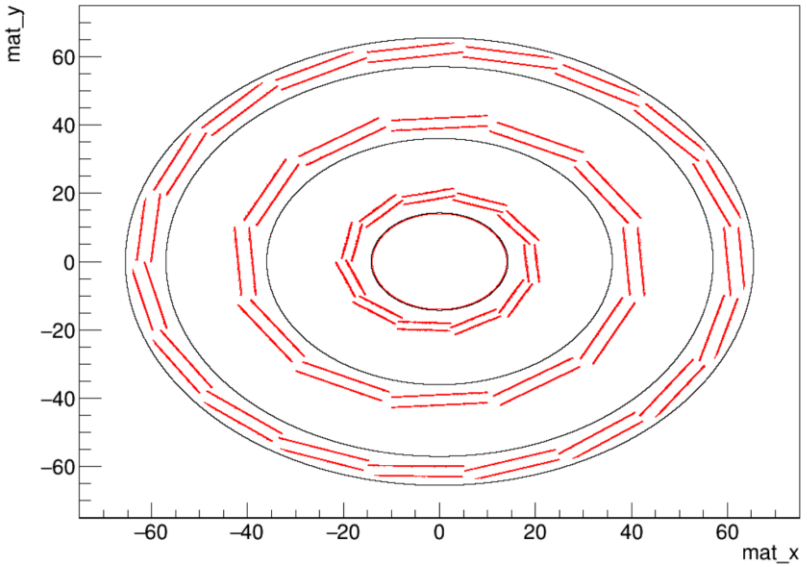




Material mapping*

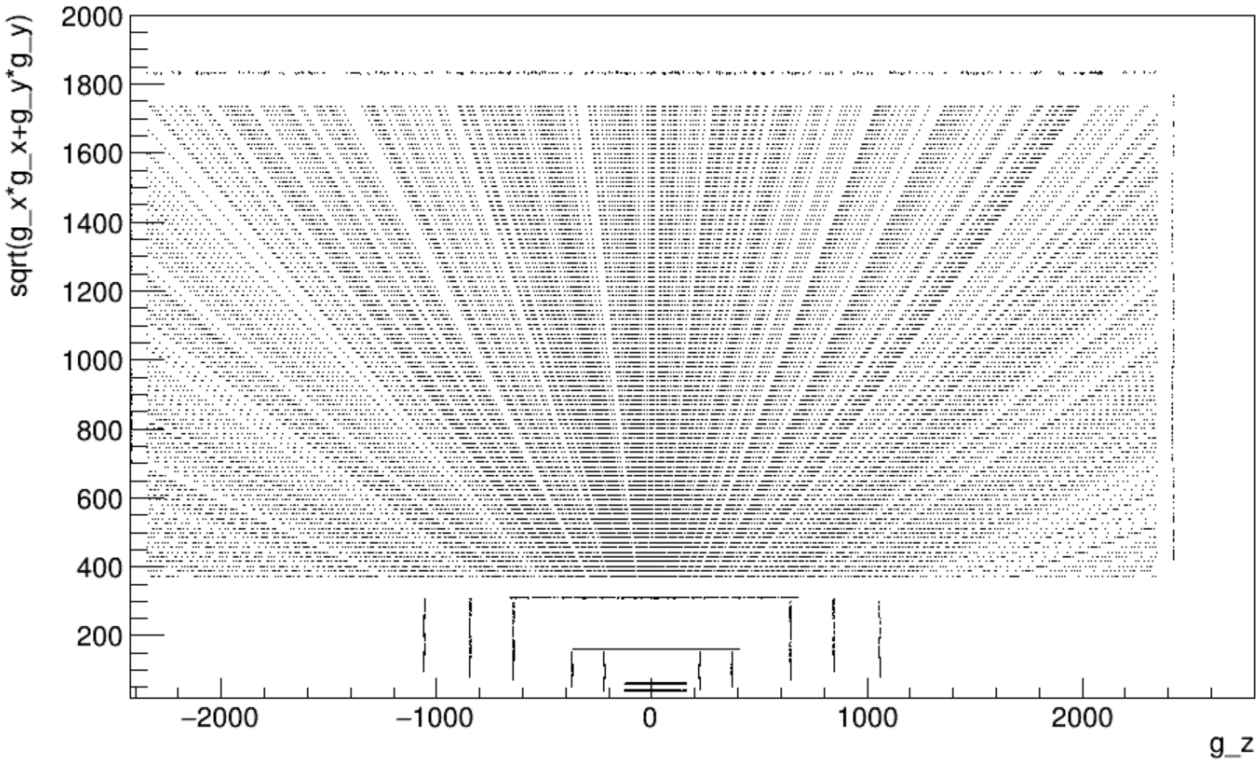
- Mechanism works with vertex but not fully correct
- TPC Mechanism doesn’t work





FATRAS

Looks correct at where “simulate the hits”



Kalman filter

- Work in progress
- Without smoothing