CEPC SDT on CEPCSW Status

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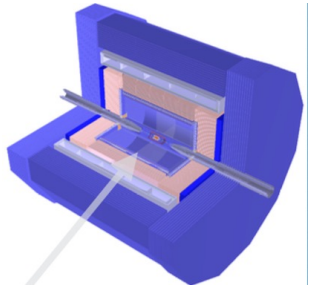
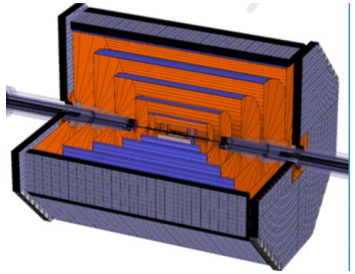
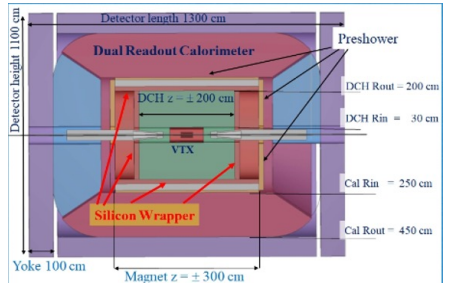
Introduction

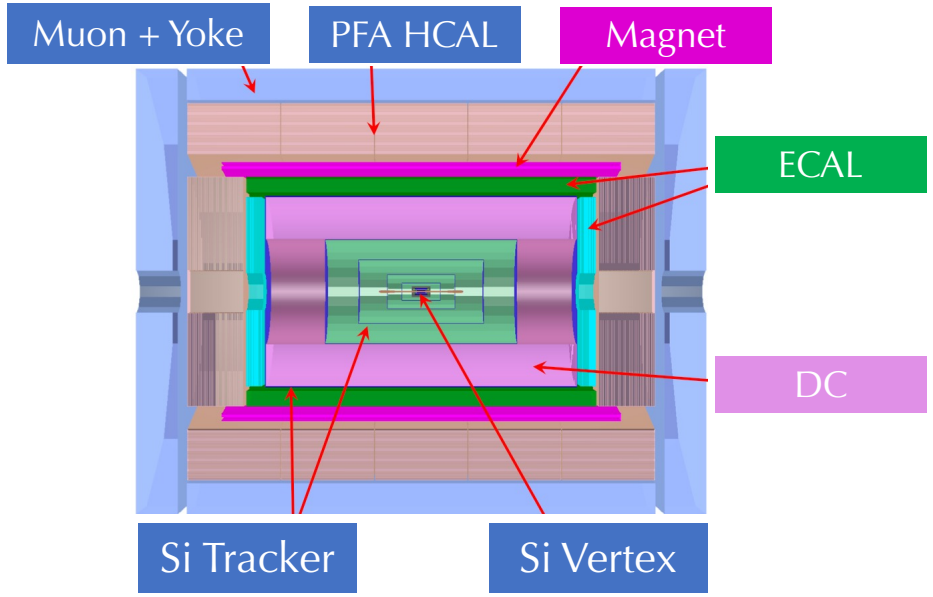
- Three existing detector concept for CDR
  - Silicon + TPC
  - Full Silicon Tracker
  - IDEA Concept







- The 4th detector concept
  - Silicon Vertex + Siliconn Tracker for momentum measurement
  - Drift chamber optimized for PID
  - Transverse crystal bar ECAL optimized for π^0/γ reconstruction
  - Solenoid magnet between HCAL and ECAL



Studies based on LDT software

Configuration for simulation study from Yangzhou meeting (v0)

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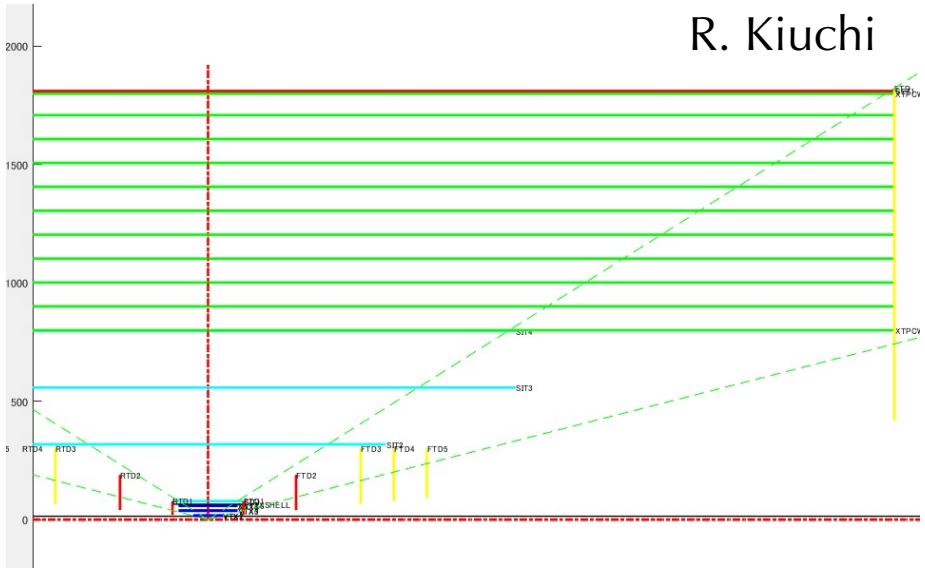
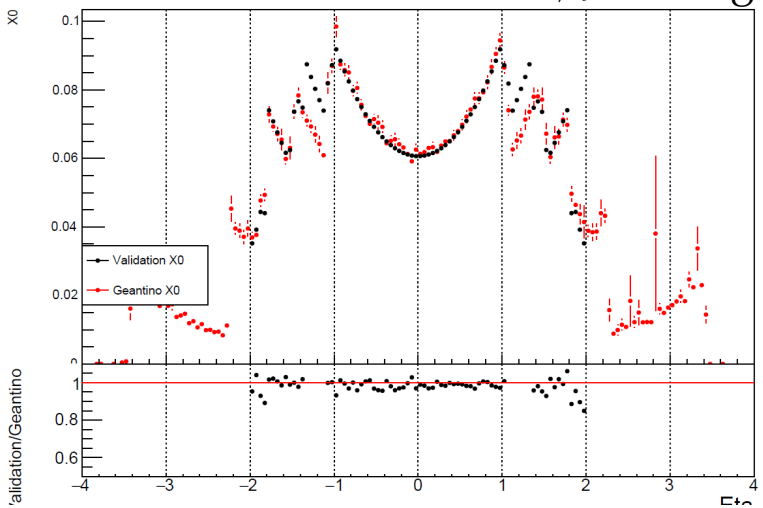
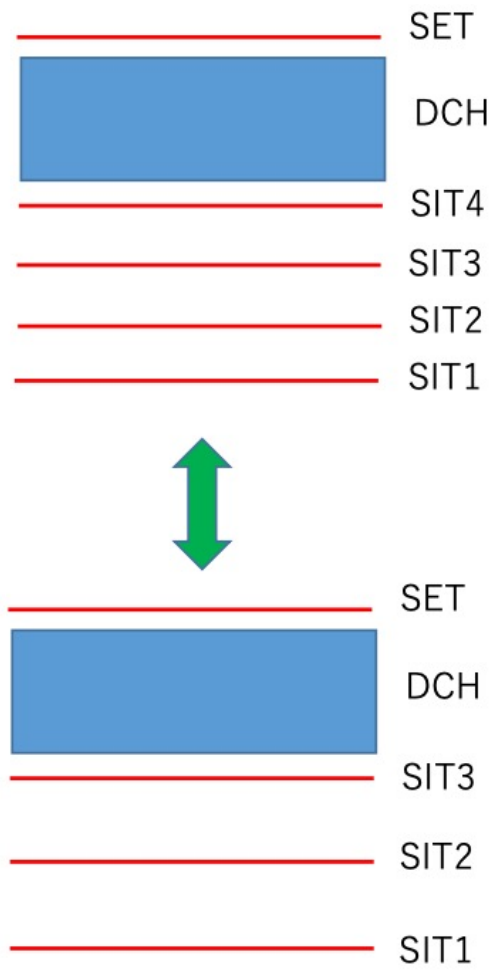


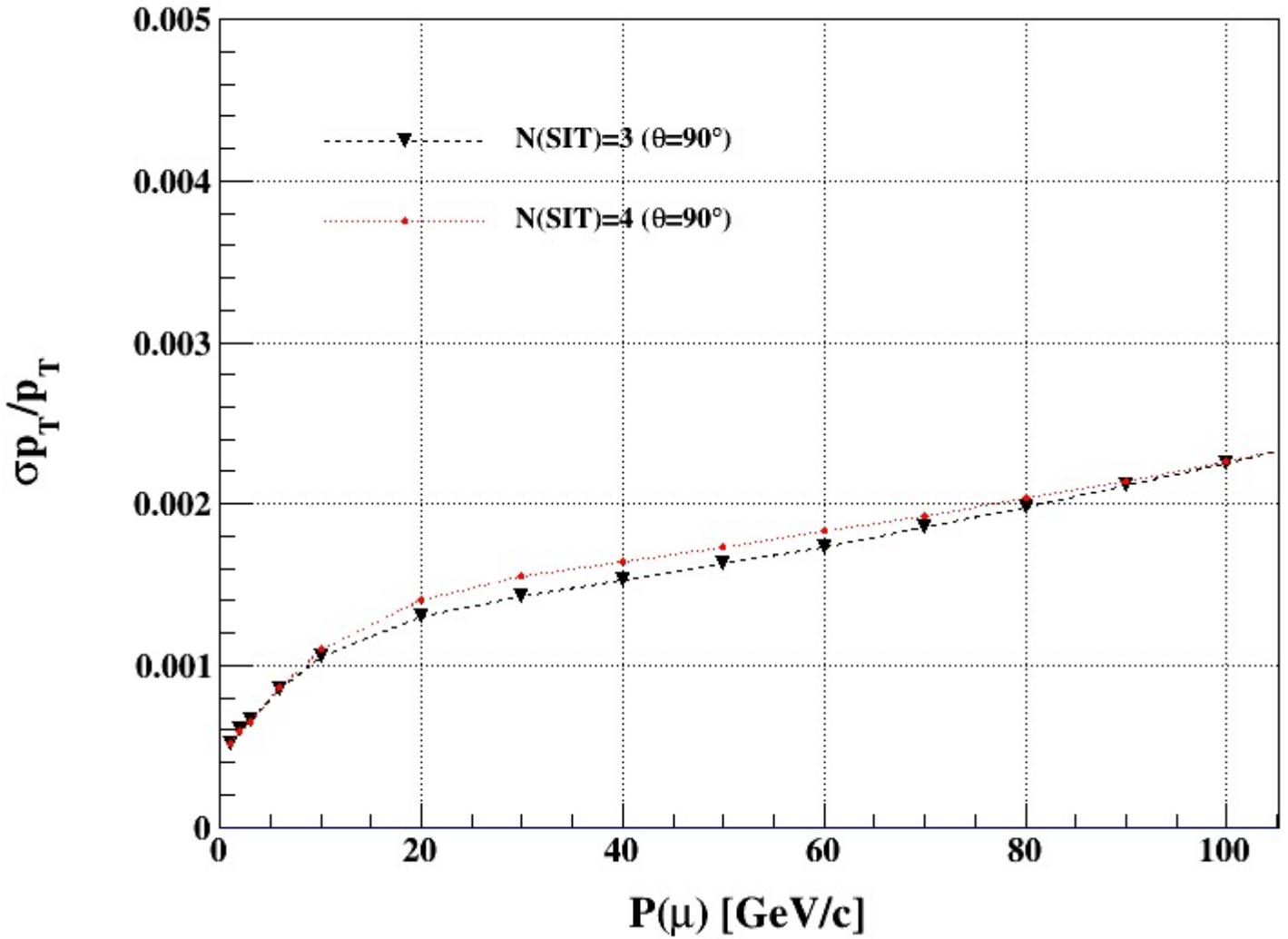
Y. Chen, J. Zhang



Sub detector	N layers	Resolustion (μm)		Material budget (%X_0)
		r-ϕ	z	
VXD	6	2.8 / 6 / 4 / 4 / 4 / 4	2.8 / 6 / 4 / 4 / 4 / 4	0.15 per layer
SIT	4	7.2	86.6	0.65 per layer
DC (cell 1x1cm^2)	100	100	2000	1.2
SET	1	7.2	86.6	0.65
Total	111	--	--	5.35

New config for Silicon + Drift chamber: 4 layers of silicon (v1)





shows better resolution at this momentum range

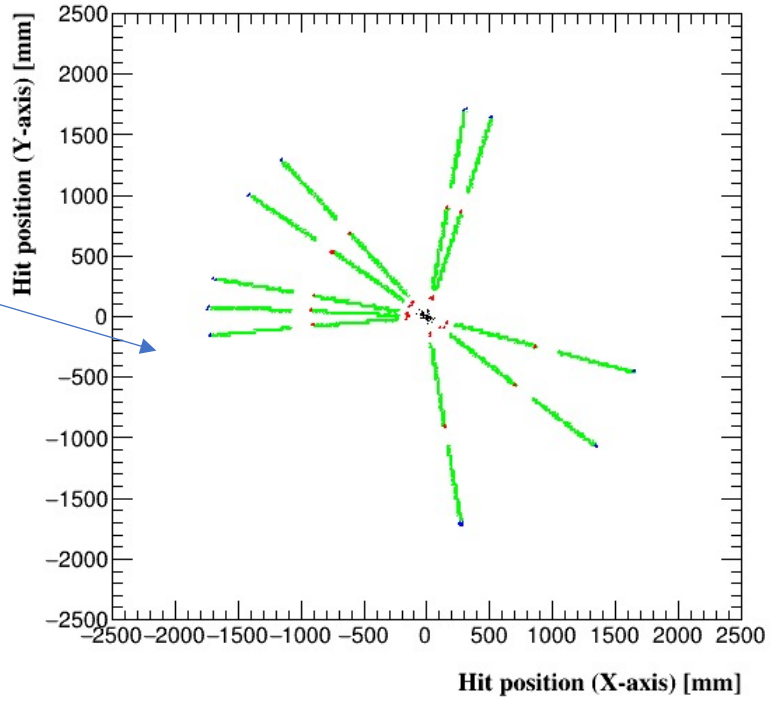
Switching to CEPCSW

Current status from the CEPCSW (Drift chamber)

- Detector configuration: vertex + silicon + 2*drift chamber
- Fitting programme (Genfit2) with driftchamber+silicon detectors
- Outcome: could produce the momentum resolution

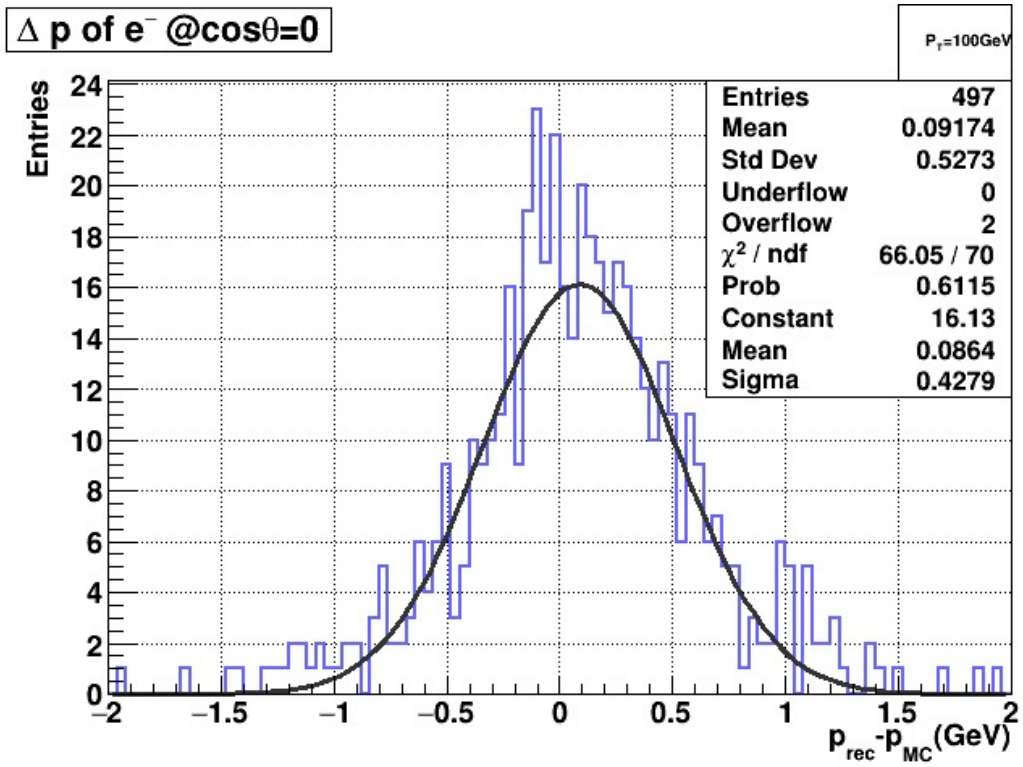
Hits information:

VXD : black
SIT : red
DC : green
SET : blue



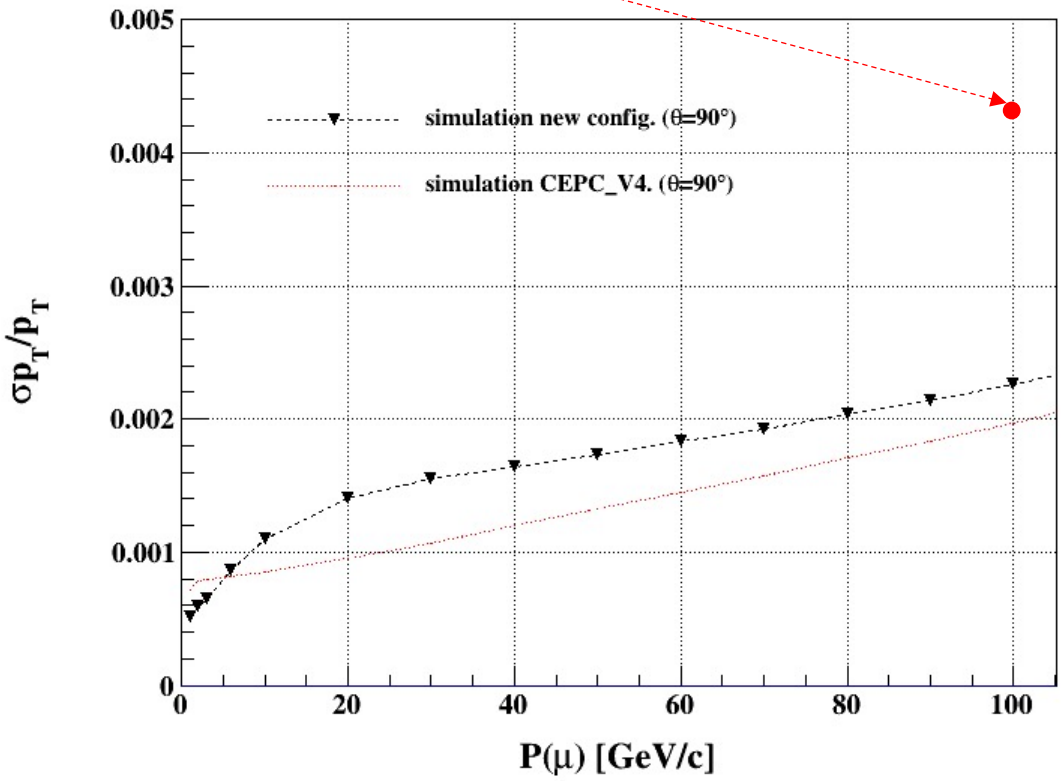
Momentum resolution

dp/p = 0.4279/100 = 4.279 × 10^{-3}



500event @ 100GeV

- ***different configuration (from the one shown in the Yangzhou meeting)***
- ***number of events***
- ***further verifications***



Plan for CEPCSW

- Prepare the detector config file for v1 (i.e. 4 layers of Si + 1 DCH)
- Obtain the momentum resolution figure
  (with the help from CEPCSW developers)
- Focus on the barrel region
  - Material buget dependent from DCH (which side)
  - Momentum reso. w/ and w/o DCH
  - Parameters of DCH (thickness, cell size, gas)
  - Other angles in barrel
  - PID performance