

Status on SDT simulation work






Contents

- Switch to use LDT to see the performance difference from different tracker composition

Timeline suggested from Xin last week

The screenshot shows a Trello project board for 'CEPC SDT'. The board is organized into three columns: 'SDT v2.0', 'SDT v2.1', and 'Future Release'. The 'SDT v2.0' column contains six tasks, with the first three highlighted by an orange box. The 'SDT v2.1' column contains two tasks, and the 'Future Release' column contains two tasks. An orange arrow points from the highlighted tasks in the 'SDT v2.0' column to a text block on the right.

SDT v2.0 6

- ☐ Silicon Tracker Optimization 
Due at Last Fri 2/3
- ☐ PID with dN/dx 
Due at Fri
- ☐ PID with timing layer 
Due at Dec 4
- ☒ Use the IDEA gas composition 
1/1
- ☒ Integrate into master branch 
3/3
- ☒ Get the dE/dx info

SDT v2.1 2

- ☐ Add material budget
- ☐ SDTv2.1 R=1.5m dE/dx

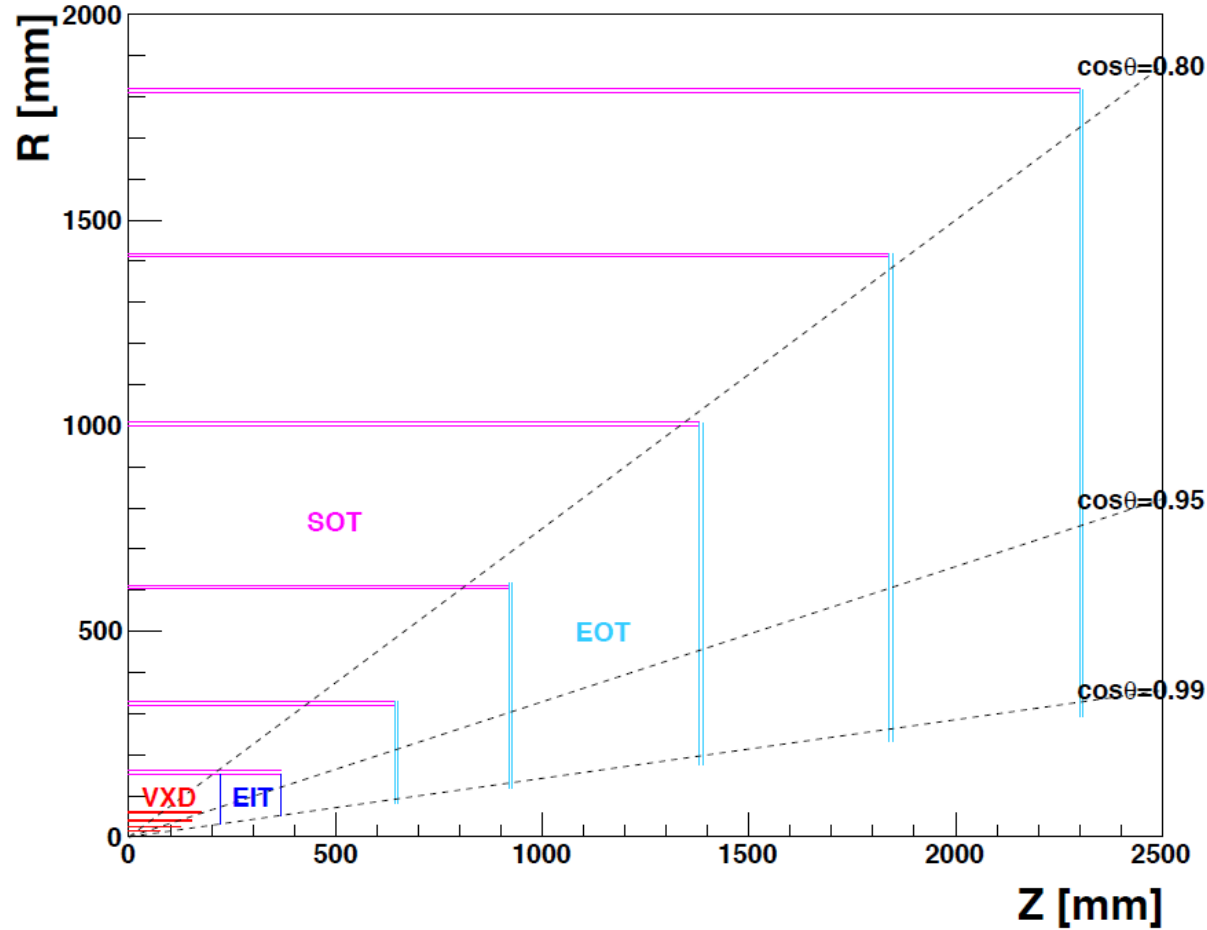
Future Release 2

- ☐ Signal digitization effect on dE/dx
- ☐ GarField to replace GEANT4

part of motivation to switch to LDT to estimate the tracker performance

Reference (from CDR) : FST&FST2

FST



FST2

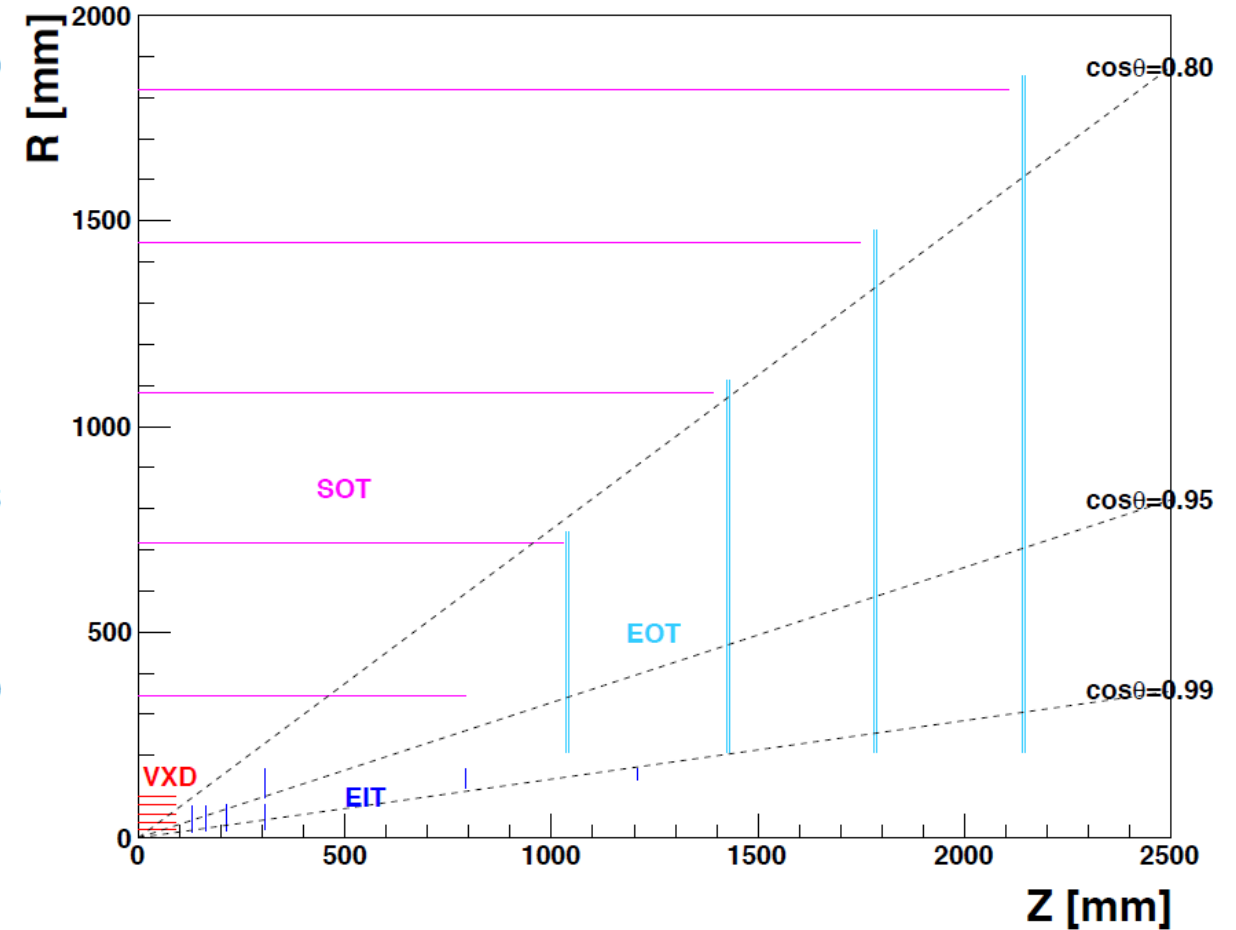
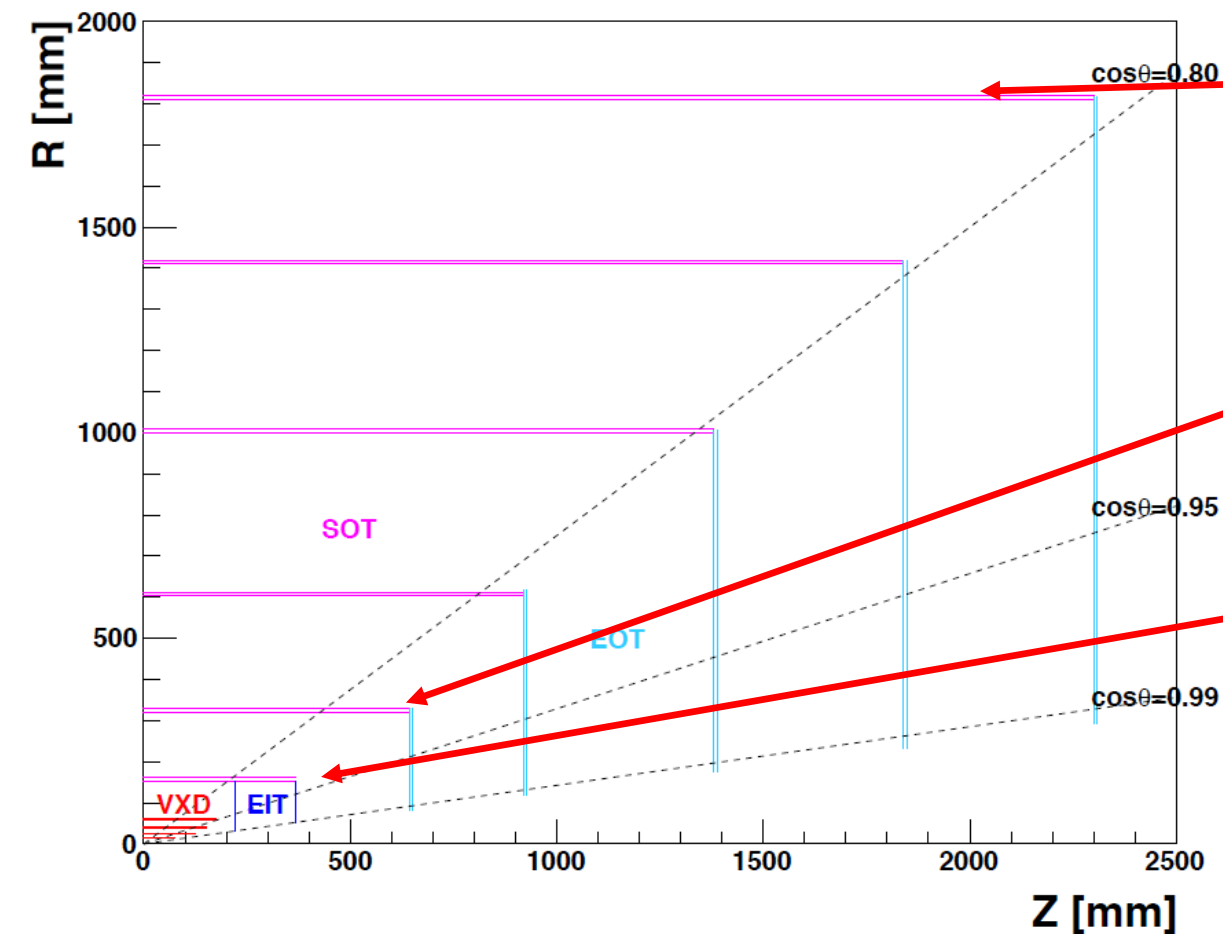


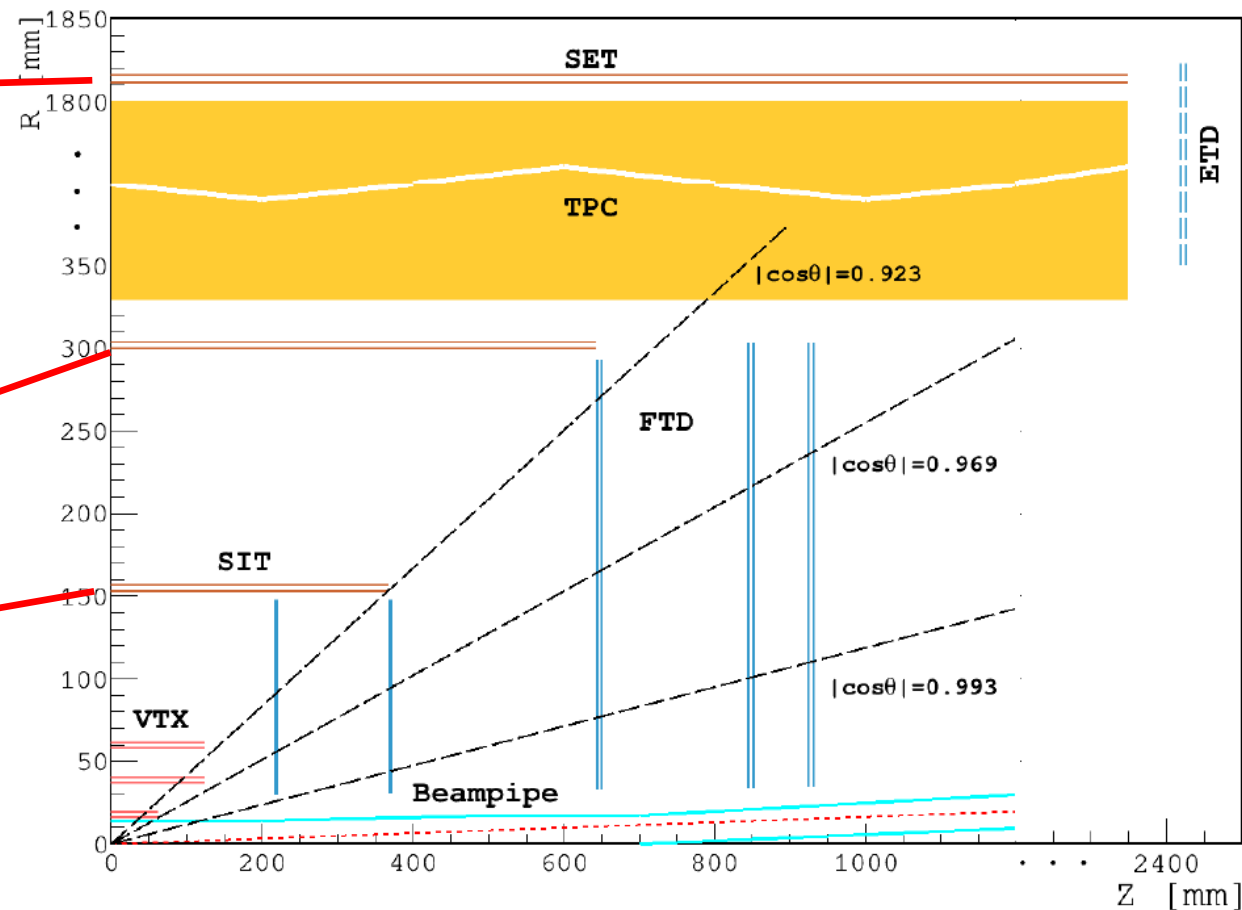
Figure 4.23: $R - Z$ views of the full-silicon tracker options, FST (top) and FST2 (bottom). In the FST layout, the full strip detector (SOT and EOT) is composed of double silicon strip layers. In the FST2 layout, the SOT consists of single layers, while the EOT consists of double-strip layers.

Tracker position : FST & baseline

FST



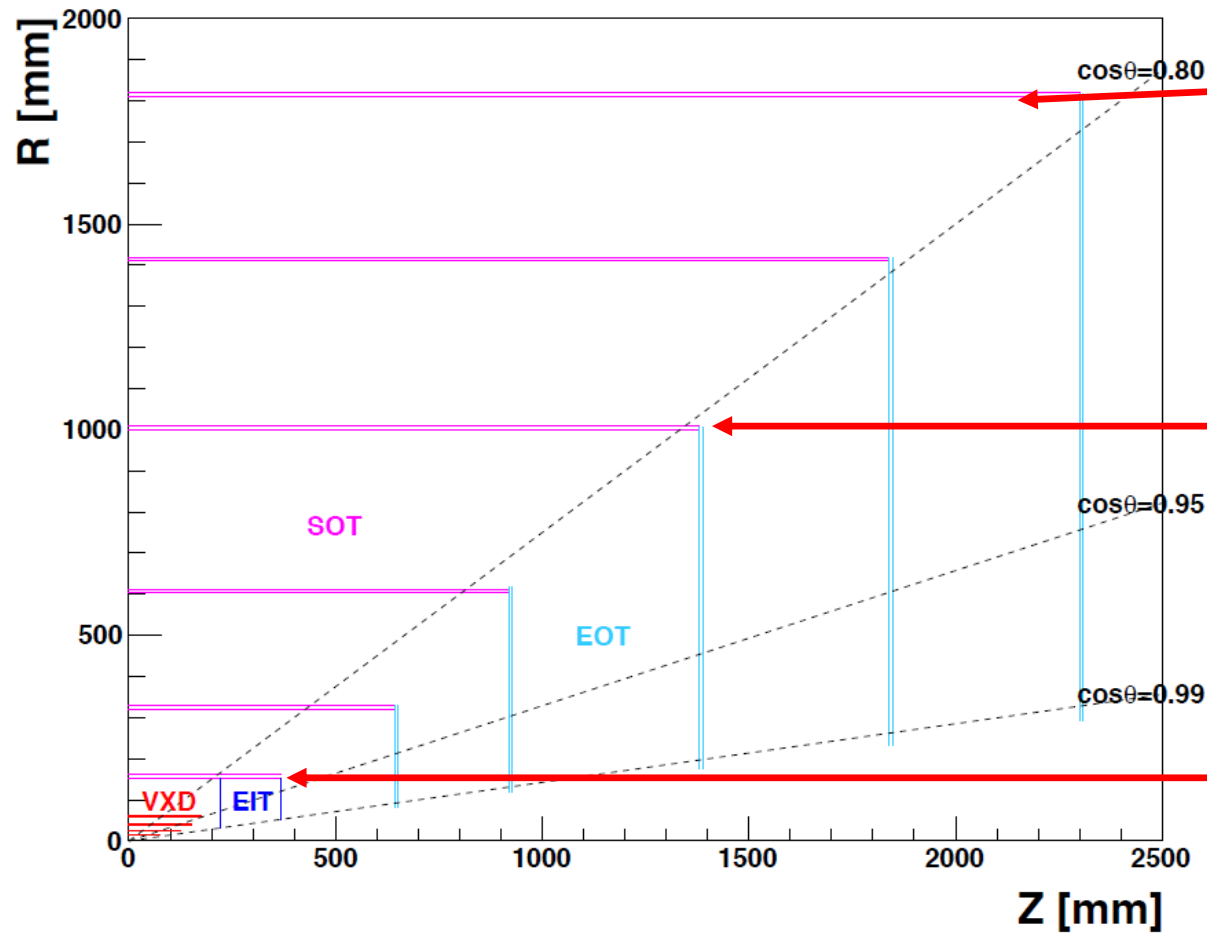
CEPC baseline detector concept



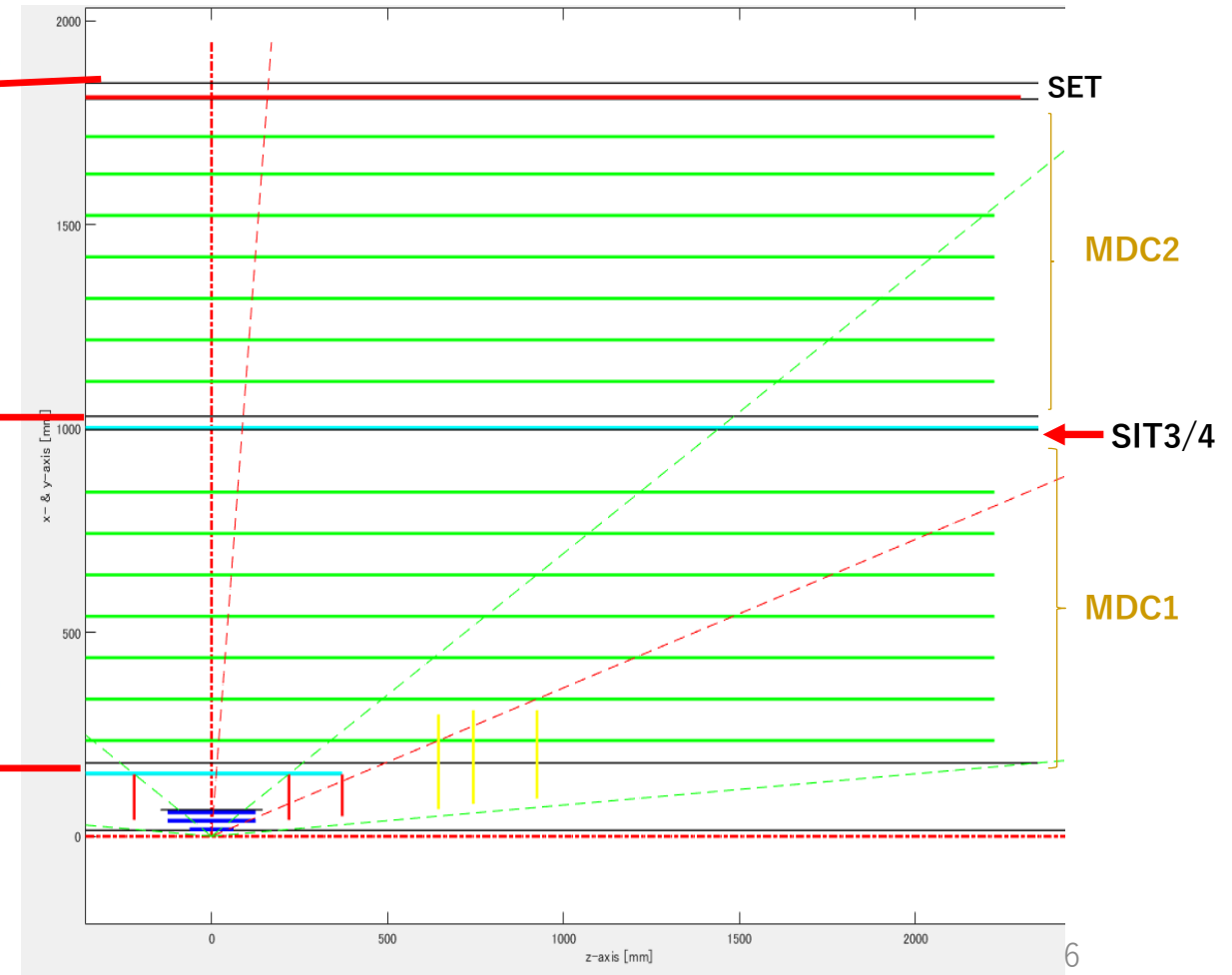
note that "R" axis, 350~1800, is drawn with a short-cut

Tracker position : FST & SDT (w 2MDC)

FST

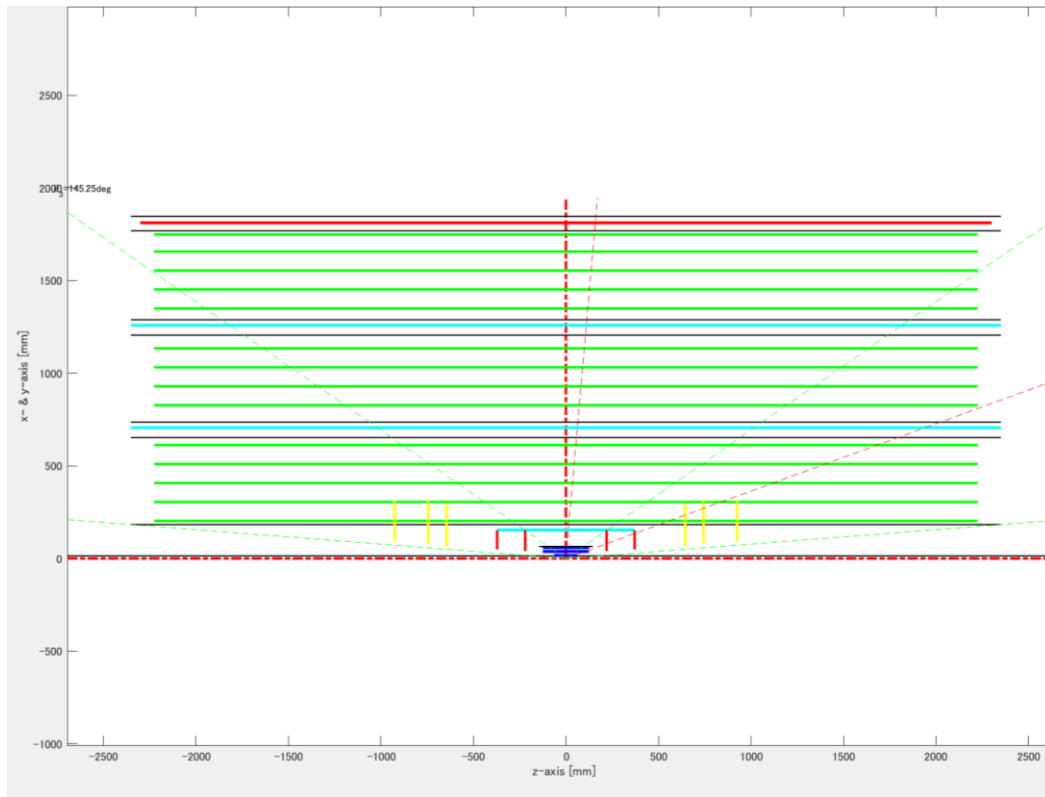


SDT(2*MDC)

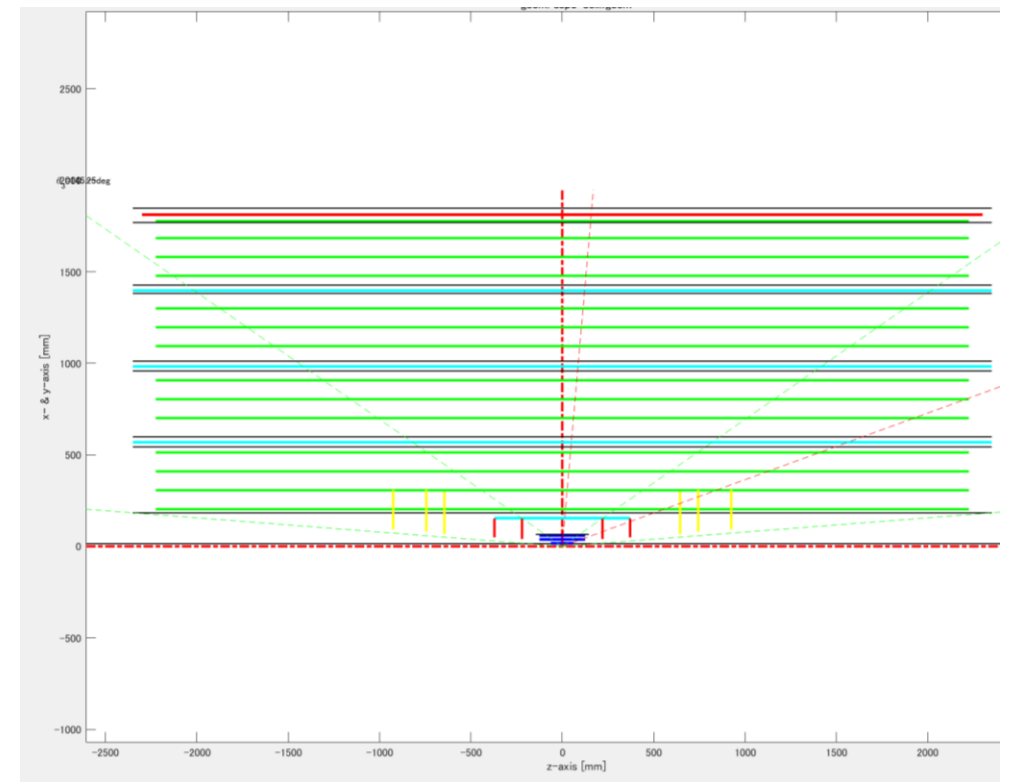


trial: SDT with different configuration

SIT1/2+SIT3/4+SIT5/6, 3*MDCs



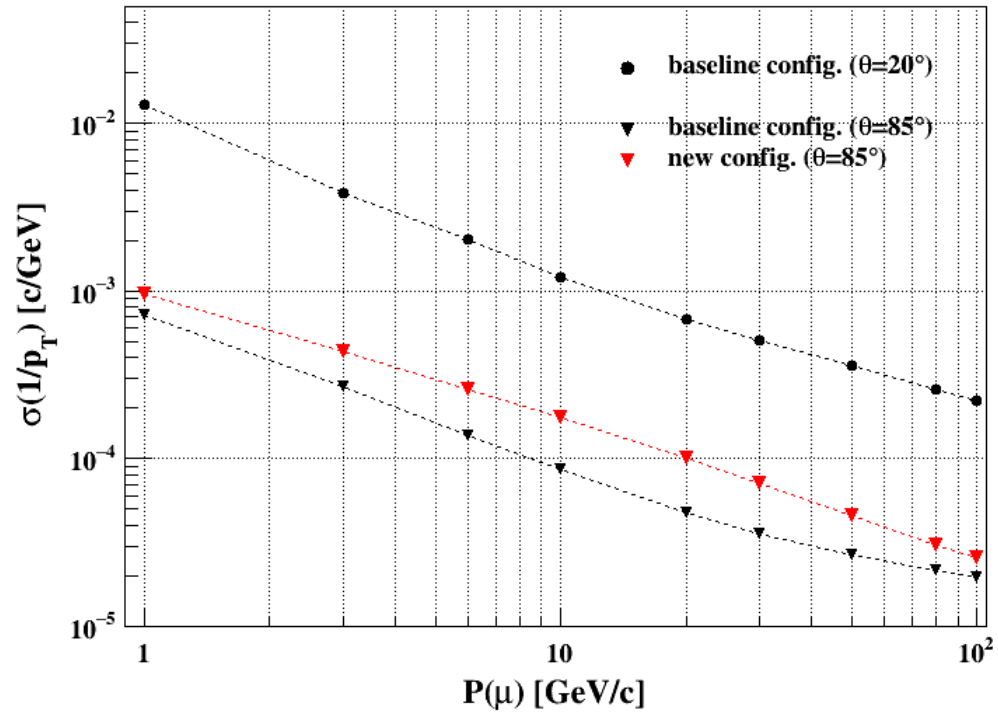
SIT1/2+SIT3/4+SIT5/6+SIT7/8, 4*MDCs



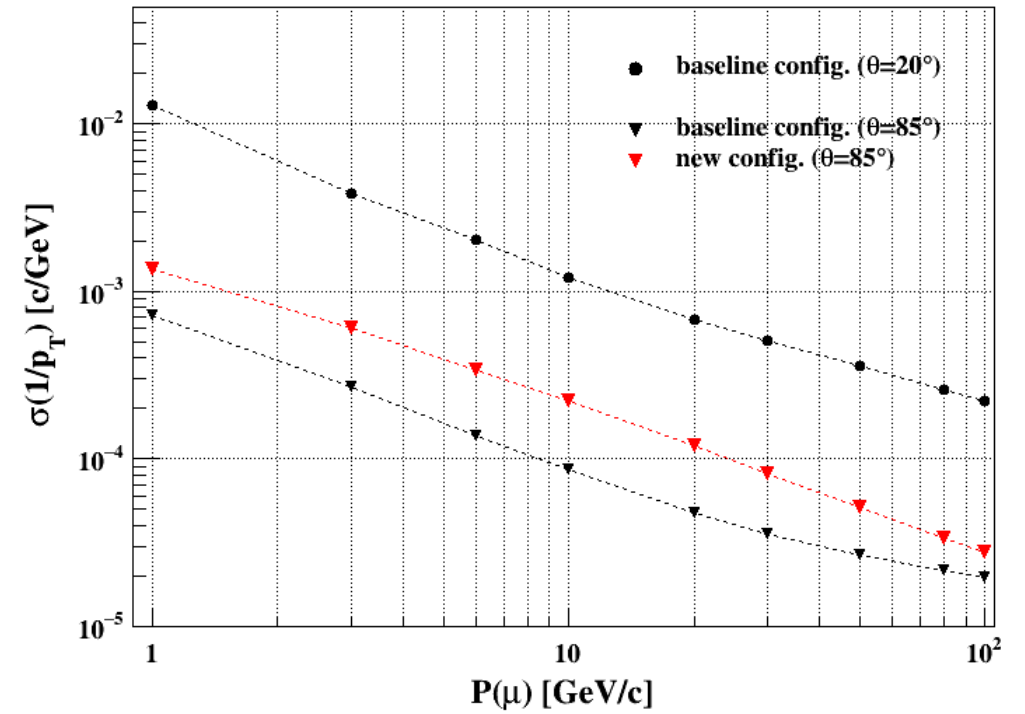
- keep the total DCH layers/dimension
- insert one (left fig.) or two (right fig.) SIT pairs

Momentum resolution

SIT1/2+SIT3/4+SIT5/6, 3*MDCs



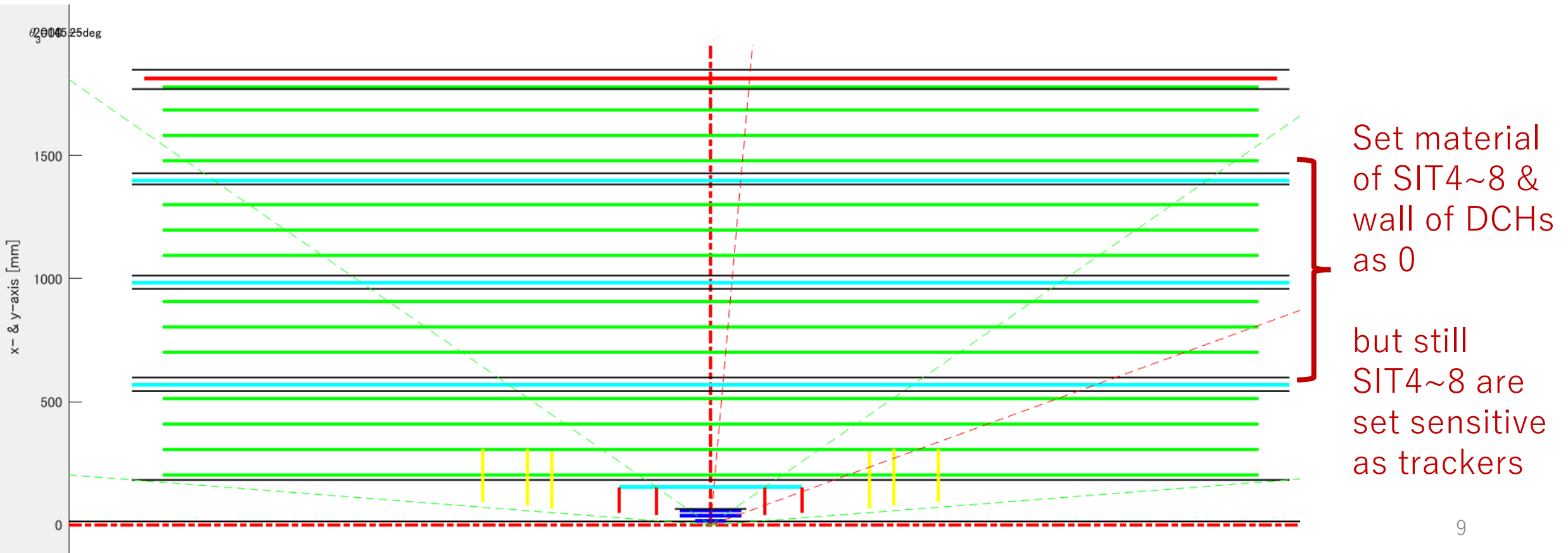
SIT1/2+SIT3/4+SIT5/6+SIT7/8, 4*MDCs



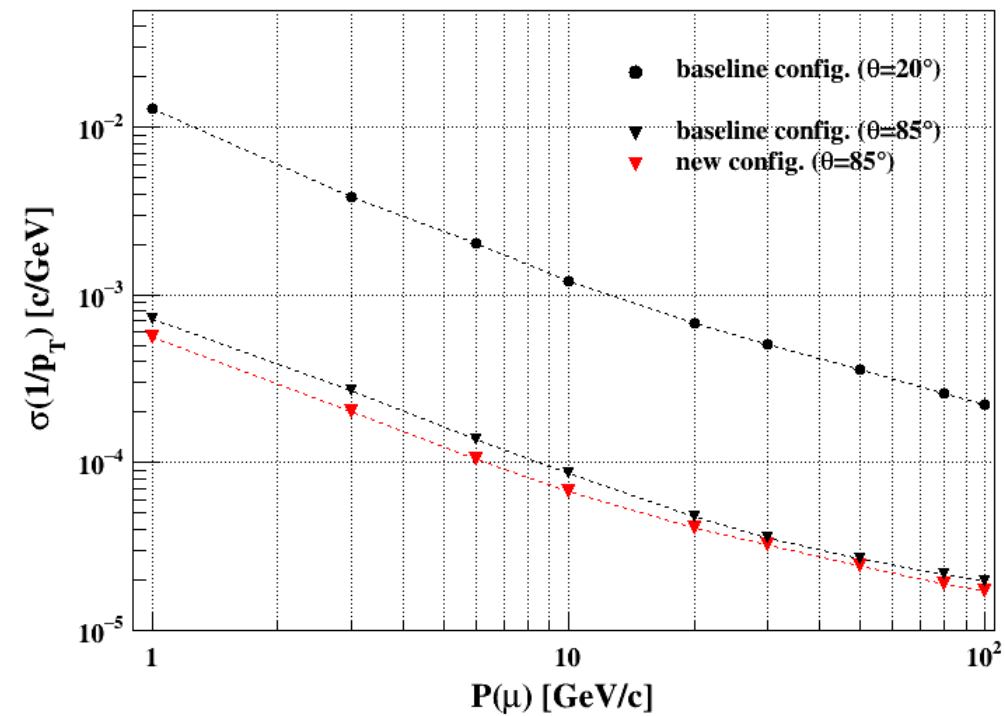
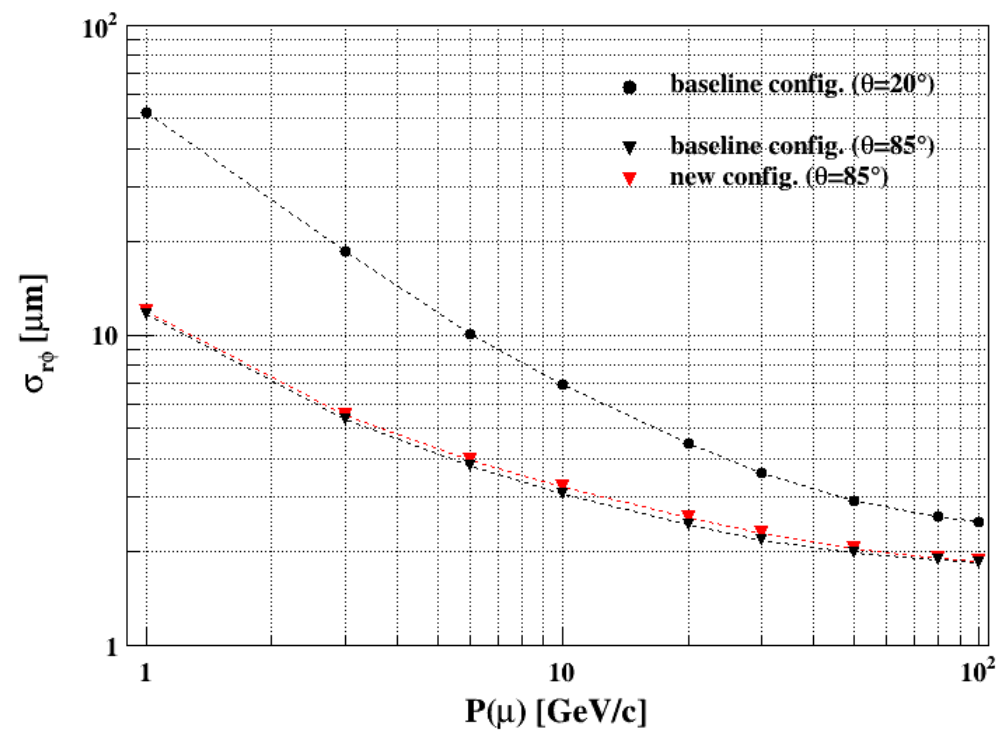
trial: set back the total material

-- material budget is the same but more layers this configuration have.

SIT1/2+SIT3/4+SIT5/6+SIT7/8, 4*MDCs



quick look



Comments

- As for momentum resolution, dependence of material budget should be investigated
- Idea about the PID performance ?
 - which level/way for the study ?