

Minutes: CEPC Reference Detector TDR Meeting in Feb 18, 2025

Attendances: Yifang Wang, Weidong Li, Miao He, Feipeng Ning, Sen Qian, Yiming Li, Quan Ji, Huirong Qi, Haoyu Shi, Qi Yan, Wei Wei, Mingshui Chen, Jingbo Ye, Linghui Wu, Jinyu Fu, Xiaomei Zhang, Zheng Wang, Fei Li, Gang Li, Huaqiao Zhang, Boping Chen, Zhaoru Zhang

Remote: Jianchun Wang, BO LIU, Changjinfan, cheyuzhi, FU Chengdong, Guang Zhao, Haijun Yang, Jinfei Wu, Jingzhou ZHAO, Kaili, Lei Zhang (NJU), Mei Zhao (IHEP), Mingyi Dong, Sheng DoNG, suen.hou, XiaoLong Wang, Xinchou Lou, Zhang Ying, Ling Zhao, Zhijun Liang

General:

Yifang: should organize a mechanics internal review asap.

Yifang: in next week, magnet, vertex, silicon report TDR summary, should include justification, mechanics design, cooling. Cost can be a separated report
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Chapter 1

Preliminary outline

Jianchun: editorial team should involve in

Chapter 2

Haijun: Sub-system help to check information in this chapter

MDI:

Yifang: 50MW is baseline

Silicon:

Need to understand the differences of 2cm/4cm

Yifang: No need to make decision now. Talk about advantage/disadvantage of 2/4cm, may choose 3cm in the end

Yifang: Regarding the option of changing outer layer of ITK to AC-LGAD for TOF, add one sentence in OTK chapter: considering the advantage of AC-LGAD, we may consider to change outer layer of ITK to AC-LGAD.

TPC:

Xinchou: Estimate the time for prototype test, it's better to include test results in TDR.

Yifang: The TDR version shown to IDRC experts should include cost, and remove them in final printed version.

ECAL:

Yifang: need to follow up the cooperation of joined R&D with FCC on SiPM immediately

HCAL:

Yifang: If the thickness of your SiPM depletion layer increases, when a particle hits it, there will be a direct particle response. This happens in conjunction with the shower, where light hits the silicon photomultiplier (SiPM) and is then amplified. This could potentially lead to conflicts.

Get a quick answer by using IHEP SR for beam test

Muon:

Yifang:

- The aim of prototype is to evaluate the problem that cannot be solved by simulation.
- The biggest challenge is to understand how many photoelectrons your scintillator can generate and what the signal-to-background ratio is. This is especially important when the length varies, as you need to quantify how the photon output changes with length.
- Main problem is software, the hit of two modules are not linked, which losing efficiency.
 - Mingshui: need to solve this problem in two weeks. Need to integrate in CEPCSW with 3 hit information.

Magnet:

Yifang: 170M is too expensive, re-calculate cost table and show it in next week

TDAQ:

Jianchun: possible cooperation with Russian people on FPGA

Software/Performance:

Mingshui: detector performance needs cross check, only use CEPCSW instead of standalone

Yifang: Sub-detector should find students to check CEPCSW and generate performance plots

Xinchou:

Muon simulation still has some problem (too large induced background). Need someone to check all the systems and solve it.

Computing:

Yifang:

Only consider 4 year Higgs + 1 year low-lumi-Z, including computer, disks, network..

Put CPU/Disks in detector system, network/air-condition in common system, infrastructure in site system

Xinchou: Need to design T0 (Henan), T1 (IHEP)

Mechanics:

yifang: change title of 14.4.2 to service and electronic system

Yifang: Suggest only put yoke, magnet, calorimeter mechanics in this chapter, others put in sub-detector

Yifang: need to refine the cost

manpower request, discuss with Xiaoyan Ma

cost:

Yifang: Miao provide an example of accelerator cost review slides as reference. Need to justify the cost.