

Minutes: CEPC Reference Detector TDR Meeting in Sep 3, 2024

Meeting agenda and minutes

- indico page: <https://indico.ihep.ac.cn/event/23459/>
- Participants Present in the meeting room (M.B. 122):
 - Yifang Wang, Xinchou Lou, Weidong Li, Miao He, Shengsen Sun, Linghui Wu, Guang Zhao, Mingyi Dong, Jingbo Ye, Joao Guimaraes da Costa, Gang Li, Yiming Li, Quan Ji, Huirong Qi, Fei Li, Haoyu Shi, Mingshui Chen, Qi Yan, Xuai Zhuang, Manwen Liu, Yunyun Fan, Sen Qian, Zhijun Liang, Feipeng Ning, Yong Liu, Zhaoru Zhang
- Online at ZOOM:
 - Bo LIU, Boping Chen, Jinfan Chang, Fangyi Guo, Haijun Yang, Hengne Li, Hengyu Zhang, Jinfei Wu, Jianchun Wang, Jingzhou Zhao, Jinyu Fu, Quan Ji, Jun Guo, Mei Zhao, Mengzhao Li, Shanzhen Chen, Suen Hou, Tao Lin, Wei Wei, Weizheng Song, XiaoLong Wang, Xiaolu Ji, Xiaoting Li, Xin Shi, Xiongbo Yan, Xuai Zhuang, Yang Zhang

MDI: Haoyu Shi

- Yifang: prepare a talk about mask situation in background simulation at next CEPC Day

Vertex: Zhijun Liang

- International cooperation with IPHC/CNRS
 - Yifang: important to become partner with ITS3, because their achievement can share with us.
- testbeam@HEPS
 - Yifang: just assign one line for vertex study
- Yifang: regarding stitching, at least should show Rodamap at IDRC review.

Tracker: Qi Yan

- ITK installation steps
 - Yifang: need a detailed analysis for installation precision requirement, and how to achieve the precision.
 - Quan: can finish the calculation before Oct review
- OTK – power consumption: 20mW/channel
 - Jingbo: target is 15mW, need further optimization
 - Jianchun: clarify definition of 1.71W/cm², suggest to change to total power with total detector area
 - Yifang: firstly unify opinion inside group. The power calculation cannot be too conservative, which may result in extra materials for cooling
 - Yifang: OTK thermal design is not acceptable
- OTK endcap design
 - Qi: new design to increase wafer usage rate
 - Yifang: different design needs comparison, discussion, and preliminary conclusion inside

group

- Xinchou: suggest to have mini-workshop on Saturday, need better coordination for silicon group
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TPC: Huirong Qi

- Yifang: good to cooperate with LCTPC
- Huirong: beam test result can be ready before TDR release

ECAL: Yong Liu

- Yifang: good to see the detailed working plan, make sure all parts have responsible person. Show results in 3 weeks.
- Yifang: ECAL mechanics should report progress every week

HCAL: Sen Qian

- Yifang: strat to write TDR contents, but re-organize TDR structure
 - suggests to firstly introduce baseline (glass) from beginning to the end, then talk about test result of plastic scintillator.
- Yifang: clarify mechanics responsible person for barrel and endcap
- Jianchun: there is no rush to prepare for it; instead, manpower should be focused on the TDR. The long shut-down of the LHC will be postponed until 2027.

Muon: Xiaolong Wang

- Yifang: remind that need to put paraffin in endcap, with 10cm thickness
- Yifang:
 - the detector design and electronic design need to be completed as soon as possible.
 - There is no need to immediately conduct detailed circuit design. The focus is on determining electronic indicators based on physical requirements, such as charge measurement and time resolution.
 - Electronic design is relatively simple, estimate parameters referring to JUNO-Tao detector, etc.
 - Unnecessary functions should be eliminated in the design to ensure all specifications are reasonable and accurate. Approval of the schematic diagram is required before proceeding with detailed circuit design.
- Yifang: **ECAL, HCAL, Muon (plastic) should submit electronics requirement to Wei Wei in one week**

Magnet: Feipeng Ning

- Yifang: analysis the comparison of magnet design with other experiments, understand technology differences, advantage of our design, etc.
 - Feipeng: provide analysis result in 1-2 weeks

Electronics: Wei Wei

- Yifang: regarding power consumption of OTK, we care more about total power.
 - Need further optimization, considering thinner strips..

DAQ: Fei Li

- Yifang: regarding speakers for DAQ session in CEPC workshop, try to contact DAQ experts in IDRC committee to get some suggestions.

TDAQ: Fei Li

- Yifang: no mention LLM at IDRC review

Mechanics: Quan Ji

- Yifang: make sure vertex will be integrated to software and mechanics before next week

Performance: Xuai Zhuang

- Yifang: The new physics WP should be finished very soon, otherwise we will miss the proper time window to show it
 - For the plot in page 5, it needs to show quantitative analysis.

Cost: Miao

- Jianchun: Miao should be involved in sub-groups discussion when detector design is almost finalized
 - Yifang: Miao provide unified table template to sub-detectors for cost estimation

AOB:

Xinchou/Yifang: Carefully consider technology choices and parameters, participate in international conferences and read relevant papers, to make comparison with international level. It can reflect our academic level, and analysis is needed when making decision of technology choices.