

CEPC Reference Detector TDR Meeting (May 28, 2024)

09:00 - 11:50 (Beijing Time)

Meeting agenda and minutes

- indico page: <https://indico.ihep.ac.cn/event/22493/>
- Participants
 - Present in the meeting room (M.B. 112)
 - Miao He, Tainchi Zhao, Guang Zhao, Linghui Wu, Shanzhen Chen, Shaojing Hou, Zheng Wang, Joao, Yifang Wang, Haoyu Shi, Feipeng Ning, Zhijun Liang, Zhaoru Zhang, Jianchun Wang, Wei Wei, Xinchou Lou, Mingshui Chen, Manqi Ruan, Yunyun Fan, Jinyu Fu, Huirong Qi, Lei Zhang, Mingyi Dong
 - Online at ZOOM
 - Ling Zhao, Tao Lin, Bo Liu, Xin Shi, Xian Shu, Jinfei Wu, Feipeng Ning, Jianbei Liu, Zhan Li, Shang Xia, Boxiang Yu, Jingzhou Zhao, Gang Li, Yang Zhang, Shengsen Sun, Jinfeng Chang, Mei Zhao, Ying Zhang, Wenxing Fang, Xiongbo Yan, Haijun Yang, Lei Zhang, Hengne Li, Suen Hou, Weiguo Lu, Xiaoting Li, Meng Wang, Junsong Zhang, Yao Zhang, Boping Chen, Zijun Xu, Yubin Zhao, Yuexin Wang, Chengdong Fu, Hengyu Wang, Xiaolong Wang, Yatian Pei, Chen Ye, Yuguang Xie
 - Minutes: Miao He, Zhaoru Zhang

Software: Shengsen Sun

- Status report: [slides](#)
 - release trd 24.5 for PID
 - standalone dN/dx available, to be released; TOF to be released soon;
 - MUC full simulation +reconstruction is planned by June
 - impact of inhomogeneity of magnetic field started
 - calorimeter: talk at CALOR 2024; comments by Roman Poschl and Renyuan Zhu; calibration for ECAL and HCAL; MC and reconstruction
 - visualization: phoenix event display for CEPC is available
 - Arbor immigration
- Discussions
 - Jianchun: time to release: beginning of June
 - Yifang:
 - make sure released software is based on latest detector design and options
 - clarify missing parts and items need everyone focus on
 - firstly finish geometry, reconstruction..and full structure asap, no urgent to provide people for software for physics
 - separate ECAL and HCAL to two groups, choose new conveners; make criteria for the options, and make decision asap (refer to the way of tracker);
 - Joao: what solution for comparison between options of calorimeter?
 - Jianchun: We have to make sure baseline solution and all the values, all the property can be delivered the first.

- Manqi: breakdown task list for new manpower, think about how to arrange manpower

Mechanics: Quan Ji

- Status report: [slides](#)
 - general drawing updated for vertex.
 - no extra space for out tracker. 20 mm is not enough.
 - cooling design of vertex: using beampipe
 - need written requirement from detector and electronics through work contact form.
 - Additional manpower and regroup of engineers
- Discussions
 - Yifang: need project office (Zhaoru for now)
 - Jianchun & Jianbei: consider one engineer for barrel and end HCAL

Magnet: Feipeng Ning

- Status report: [slides](#)
 - sampling interval 10 cm has no impact on momentum resolution
 - Mechanical design of the magnet
- Discussions:
 - Yifang: thermostat design to be discussed with low-temperature group.

MDI: Haoyu Shi

- Status report: [slides](#)
 - background simulation: running slow
 - summary table of beam background sample status
 - quadrupole magnet too heavy, considering optimization of shield
- Discussions:
 - Yifang: optimize quadrupole issue from accelerator physics point of view, instead of simply adding shield

Electronics: Wei Wei

- Status report: [slides](#)
 - mini-workshop this week for event rates estimation.
 - preliminary FEE ASIC scheme
- Discussions:
 - Yifang:
 - apply for talks in FCPPL conference
 - why need single PE? Wei: calorimeter needs calibration.
 - SiPM too much noise, not necessary for SPE readout. threshold 20 PE. Dynamic range study

Vertex: Zhijun Liang

- Status report: [slides](#)
 - introduced other experiments vertex design.
 - Update on cooling design.
 - material budget is two times of CDR.

- Long barrel option is converging.
- No manpower for short barrel + endcap option.
- Discussions:
 - discussion on 40 mW/cm², if it is achievable.
 - Tianchi: a cylinder detector?

Tracker: Meng Wang

- Oral updates
- Discussions
 - Yifang: endcap has highest priority. Two weeks with the first design.
 - Meng: first fix interface with other systems, then internal design

Calorimeter: Jianbei Liu

- Oral updates
 - major study on crystal ECAL and Glass HCAL
 - consider a review for different options
- Discussions:
 - Yifang: make decision in one month, considering comparison on performance, engineering feasibility, and cost
 - Manqi: BMR important for all physics, backup is still needed

Muon: Xiaolong Wang

- Status report
 - RPC cost estimation, 13.24 M for glass and 20.34 M for Bakelite without readout.
 - Scintillator 18.5 M scaling to the same area.
 - comparison table of PS and RPC
- Discussions:
 - Yifang/Jianchun: no need for high requirement of parameters, need to match with physics requirement (time resolution, Z-direction resolution, charge resolution..)
 - Jianchun: need cost of BEE and PS

Physics: Manqi Ruan

- need more communication with sub-groups
- Discussions:
 - Xinchou: request a highlighted overview talk on CEPC day to introduce how to match fundamental physics goal and detector technical design