

Minutes: CEPC Reference Detector TDR Meeting in Nov 5, 2024

Meeting agenda and minutes

- indico page: <https://indico.ihep.ac.cn/event/24080/>
- Participants Present in the meeting room (M.B. 122): Xinchou Lou, Jianchun Wang, Shaojing Hou, Jinyu Fu, Shengsen, Jingbo Ye, Linghui Wu, Xiaolu Ji, Sen Qian, Zhijun Liang, Feipeng Ning, Mingshui Chen, Xiongbo Yan, Tianchi Zhao, Zheng Wang, Quan Ji, Yong Liu, Miao He, Weidong Li, Zhaoru Zhang, Manqi Ruan, Wei Wei, Ming Qi, Qi Yan, Haoyu Shi, Huirong Qi, Gang Li, Fei Li, Yiming Li, Yunyun Fan, Boping Chen, Fangyi Guo
- Online at ZOOM: Jinfan Chang, Haijun Yang, Hengne Li, HOU.suen, Jingzhou ZHAO, Kaili Zhang, Lei Zhang, Mei Zhao, Mingyi Dong, Shanzhen Chen, Sheng DONG, Tao LIN, , Weizheng Song, XiaoLong Wang, Xiaoting Li, Zhang Ying

General – Jianchun:

- Sub-detector should collect domestic and international collaboration institutes and their cooperation status, with each chapter ideally featuring one international institute at least.
- Please update Overleaf as soon as possible.
 - For the sub-sections temporarily missing real contents, put the information of outline, working plan and responsible editors there

MDI- Haoyu:

- Jianchun: Mingshui please organize manpower to have simulation of the necessity of TOF at 3T, especially for the particle less than 1 GeV which cannot reach to outer tracker.
- Manqi: This research is meaningful, but it doesn't necessarily need to reach a definitive conclusion in the TDR

Vertex – Zhijun:

Status:

- optimization of power consumption
- vertex digitation updated result
- updated TDR contents

Silicon tracker – Qi Yan:

For OTK sensor with dimension of ~2 cm and increased electronics component coverage, only flip chip with bump bonding is feasible.

- Xiongbo: concern of feasibility of bump bonding
- Jianchun: The estimates for cost and material budget need to be redone. If we switch to bump bonding, the advantages will be lost, with worse yield and stability.
- Jingbo: for OTK LGad, the minimum size of pad for wire bonding is 6um, which need to be considered in design.

TPC – Huirong:

- Weidong: P6: The relation of PID and $\cos\theta$, which need calibration
- Mingshui/Jianchun: the function model of PID vs $\cos\theta$ need to be included in TDR
 - Linghui: function of barrel region is ready, working on endcap region
- Tianchi: need simulation of low momentum particle, and combined simulation of TPC+ TOC

ECAL – Yong:

10mm vs. 15mm Crystal Comparison Using CyberFPA – Shengsen

- Haijun: Decision of 10mm vs. 15mm?
 - Shengsen: need one more week to further adjust all parameters for 15mm, and plan to make decision in next week. BMR may be optimized by fine tuning
- Tianchi: need to understand the relation of BMR and geometry of ECAL, since most of the hadronic showers deposit in HCAL
- Weidong: need to firstly check whether reconstruction method is correct

Electronics – Wei Wei:

- Jianchun: What's the plan of different size of long strip MWP? Need to be prepared soon.
 - Mei: designs are ready, will start MWP asap.
- Jingbo:
 - SiPM ASIC scheme (0.1~3000MIPs) : need to clarify the saturation point and linearity requirement? In principle, it is saturated at 1000MIPs.
 - ◆ Yong: for 6um SiPM, it was not non-linearized at 3000 MIPs.
 - Need to clarify the TOT requirement of LGAD energy measurement

Software – Weidong:

- Xinchou: need specific research of AI consideration in TDR, because AI is highly emphasized in European Strategy

Mechanics – Quan:

- Response of IDRC review
- Requirement of mechanical Design of Ref-TDR Report: (Includes.....)
 - 1. Mechanical main structure (calculation and analysis)
 - 2. Cooling Structure (calculation and analysis)
 - 3. Pipeline layout
 - 4. Connection structure of ECAL-HCAL/TPC
- Xinchou/Jianchun: need another discussion for the organization of mechanics team

Cost – Miao He:

Miao: Cost summary table in overleaf, need inputs from all sub-detectors

Jianchun: detailed cost table will not put in TDR, but need accurate calculation