CEPC Physics and Detector Plenary Meeting

Time: Wednesday, May 6, 2020 from 15:00 to 19:00

Location: Vidyo only

Attendance: Franco Bedeschi, Gabriella Gaudio, Hao Zeng, Hongbo Liao, Huaqiao Zhang. HUirong Qi, Jianchun Wang, Quan Ji, Joao Guimaraes da Costa, Liang Li, Gang Li, Manqi Ruan, Mingyi Dong, Paolo Glacomelli, Peilian Liu, Roberto Ferrai, Suen Hou, Xin Shi, Zhijun Liang, Yanyun Duan, Yazhou Niu, Yong Liu, Zhaoru Zhang, Zhenyu Zhao, Chenjie Jiang

1. Status of Detector R&D Projects --- by Joao Guimaraes da Costa

(1) Joao updated the status of materials for Detector R&D projects. Firstly, the mission is to produce coherent list of Detector R&D activities. Each current CEPC-related R&D project should provide, key information to the IDRC:

- The objectives of the project
- The anticipated schedule on which the objectives will be met
- The funding available to the project, and the leadership arrangements within it
- The extent to which the project is a CEPC-specific development
- Manpower needs

(2) He required conveners to provide the missing documents before noon of May 7th in China time, because he needs to report the status at CEPC Day/Steering Group.

(3) Joao summarized the status and action since last week:

1.1: Need expanded version (João) - with help of Zhijun and Ouyang

1.2: Received update from Manuel Looks good, but needs formatting updates

2.1: TPC: Needed a better schedule – Joao will contact Huirong offline

2.2: Discussion on possibly merging projects. Need for more details Meeting on Monday.
Response: will send the new version before Thursday morning

3.1: ECAL: Both needed update schedule
Response: will send detailed schedule before deadline.

3.2.1: DHCAL needed update format

3.3: DR calorimeter project in Korea to be included and expanded
Response: Roberto will update a version

4.2: Muon detector: Update title – Paolo has updated

6.1: MDI: Considerable updates needed – Suen will send a new version tonight.

6.2: Mechanic: Needed updates 8: Not existing – Hongbo will send a version tomorrow.

(4) Please update this indico page and email me to let Joao know you have done it.

2. Detector optimization – by Manqi Ruan

Manqi introduced the detector optimization update for Tracker R/Z ratio and constrains on solenoid material if placed inside HCAL. For the tracker simulation, his team found that Optimal Value of R is ~ 1.8 meter for the CEPC detector with comparable cost estimator (Tracker Volume, Calo Volume, Track Area). For HCAL, BMR = 4% requires solenoid material < 10 cm iron (0.4 Lambda), and BMR = 4.6% requires solenoid material < 25 cm iron (1 Lambda).

3. Status of DR Calorimeter – by Roberto

Roberto introduced the update of DR calorimeter on different aspects, including mechanics (absorber, structure, ...), optical elements (fibre core, cladding, filters, ...), light sensors, front-end electronics, data

readout and processing, simulations and detector performance.

4. Status of sci-ECAL – by Yazhou Niu

Yazhou introduced the updates of CEPC Sci-W ECAL technological prototype, which has a emerging progress. Next step, they will have cosmic ray test and full commissioning.

5. Status of AHCAL – by Chenjie Jiang

Chenjie introduced the update for AHCAL.

- The energy resolution of AHCAL prototype can be improved by leakage energy compensation algorithm.
- Injection molding tiles can be produced but light output is low, the craft is optimization.
- Scintillator testing platform have been built up and the batch testing is processing.
- Klaus testing board can work now and some parameters will be measured next.

6. Status of DHCAL – Liu Bing

Bing said that the technological prototype run successfully since 2012. Many results validate the performance of the SDHCAL concept. The design for Front-end board for MRPC readout is ongoing; The simulation and test module for active cooling is progressing; The new readout scheme is introduced; The RWELL detector developed as planed.

7. Status of Crystal ECAL – Yong Liu

Yong introduced the progress of Crystal ECAL. They recently developed simulation tools for Crystal readout scheme, optimized Crystal granularity, and researched requirements and TOT technique for dynamic range. They also studied characterizations with pulse injection for SiPM readout ASIC.

8. Crystal ECAL granularity optimization and performance – by Liu ChunXiu

Chunxiu focused on Crystal ECAL granularity optimization. The team constructed the BGO matrix module with 60x60x60cm3 in Geant4. They have completed the cluster reconstruction of each layer, and gave some preliminary study results. They will go ahead for further study.