Minute of the Simulation Discussion
toward Concept detector with Dual Readout Calorimeter and Wire Chamber

Vidyo Discussion: Feb 15th, 9 - 11 am Geneva time

Participants: Franco Bedeschi, Robert Ferrari, Seh Wook Lee, Franco Grancagnolo, Chengdong Fu, Manqi RUAN

Main Content:

The general strategy towards the simulation is discussed.

Consensus:

1st, The simulation should be performance oriented and be simple enough. Ideal, non-realistic, and costly geometry is acceptable for the first iteration, as far as it exhibits the physics idea and facilitate the demonstration of physics potential via simulation analysis.

2nd, Feasibility study should be emphasized, to identify & avoid potential show stoppers. The pro & con of different concepts should be identified and qualified in later studies.

3rd, The simulation code should be flexible enough and integrable. The former is to host different options & the latter is to be easily integrated back to CEPC simulation-analysis system. I.e, the general geometry parameters should be easily adjusted, to host possible changes such as to fit in a light coil & pre-showers/ECAL.

4rd, The simulation code are highly modulated. The simulation towards different sub-detectors, i.e, that for Dual-readout calorimeter and Wire Chambers, should move forward at full speed, and iterate with analysis.

Based on the above consideration, we will start with a geometry with

1, solenoid is installed outsider the full calorimeter.

2, uniform dual-readout calorimeter: without distinguish the ECAL and HCAL

3, projective segmentation calorimeter with No longitudinal segmentation. However, technically we could start with fine longitudinal segmentation and use merging code to mimic the non-segmented readout. This set up might help the evaluation of longitudinal fragmentation in the future.

Facts:

Seh Wook started to work on the 4-pi coverage projective dual readout calorimeter. A standalone simulation code will be released in a few weeks. Chengdong, the simulation experts from IHEP, will help SehWook to integrate this code into CEPC simulation.

Leech has simulation code for the wire chamber but lots of work is needed to reuse/ integrate this code. Meanwhile, Leech is short of manpower for the simulation. Chengdong and

other colleagues from BES will visit Paris for the “connecting the dots” meeting (https://ctdwit2017.lal.in2p3.fr/) which could be a nice occasion to discuss.

Plan & Action items:

1、Get a preliminary release of the Dual-readout Calorimeter simulation before the April CEPC meeting. The simulation code should be validated by providing:

1st， The Hit Map & Material Map distribution

2nd, If feasible, some general characteristic on EM moliere radius & shower/jet longitudinal leakage analysis.

2、Identify the manpower for the simulation analysis. A dedicated simulation workshop could be held after the CEPC April meeting, to help these analyzers get familiar with this simulation - analysis code.

3、Remote connection to the como meeting will be set.

4、I personally suggest we have this meeting on bi-weekly bases.