ECCE Calorimeter Working Group Overview

Calorimeter Working Group Meeting

May 4, 2021

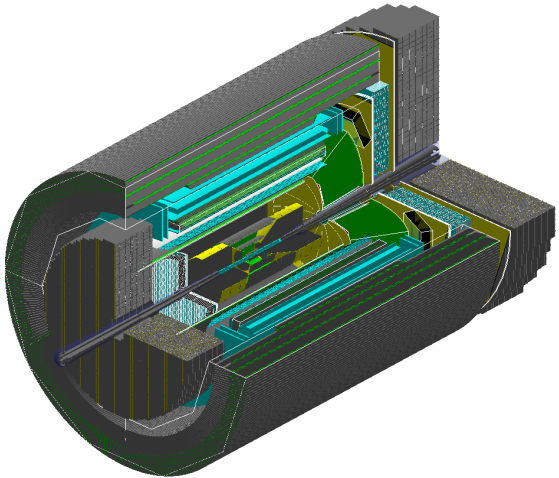
Friederike Bock & Yongsun Kim
ORNL & Sejong University

Working group organization

- **Conveners:**
  Yongsun Kim - kimy@cern.ch
  Friederike Bock - friederike.bock@cern.ch

- **Proposed meeting times for discussion:**
  Tuesdays morning (EDT) (6am - 11am)
  Wednesday morning (EDT) (6am - 10am)
  Friday morning (EDT) (6am - 9am)
  exact time to be determined

- **Mattermost channel:**
  Fun4All-Calorimeters



- **Goal:**
  We determine as a group which calorimeter setup will be proposed for ECCE taking into account physics performance, willingness of Collaborators to build it, costs and risks!

Repositories for EIC-detector development

Original sPHENIX detectors & basic algorithms

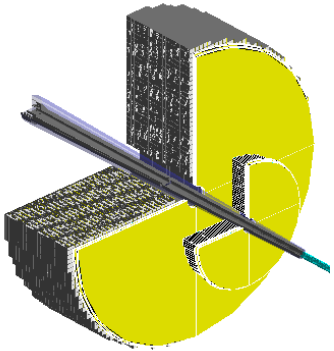
- coresoftware contains reconstruction software for sPHENIX, generators, tracking, ...
- macros contains all steering macros for sPHENIX simulations + detector components originating in sPHENIX
- calibrations contains all calibration or configuration files for sPHENIX detectors

EIC detectors & specific reconstruction algorithms

- eicdetectors contains specific EIC detector base classes, might in the future also contain specific reco algorithms
- eicmacros contains all steering macros for general EIC simulations + EIC subdetector systems
- eiccalibrations contains all calibration or configuration files for EIC related detectors

All EIC related detector developments should be done in the more generalized EIC repositories (eic) to make them available also to others, specific settings for the calorimeters in terms of placement and so on should go to ecce-macros

Backward calorimetry options



Options for E-Cal:

- $PbWO_4$ - crystal calo
- Sci-Glass calo
- Hybrid $PbWO_4$ and Sci-Glass calo

Interested Groups:
AANL, Charles U. Prague, CUA, FIU, IJCLab-Orsay, JMU, Lehigh U., MIT, UKY

Options for H-Cal:

- Re-use STAR-forward HCal
- new PSD (SHINE) like - HCal (longitudinal separation)

Interested Groups:
ORNL, Wayne State

Many open questions:

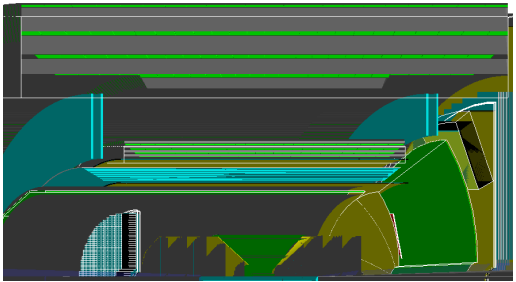
- Do we want/ can we afford timing layers in front/in between calorimeters?
- Where exactly do we place the calorimeters?
- Are the YR requirements for the HCal correct $(45/\sqrt{E}+6\%)$?
- Manpower for HCal?

Barrel calorimetry options

Options for E-Cal:

- $PbWO_4$ - crystal calo
- Sci-Glass calo
- Re-use sPHENIX EMC

Interested Groups:
MIT, CUA



Options for H-Cal:

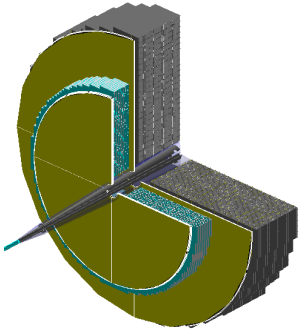
- Re-use sPHENIX HCal
- ?

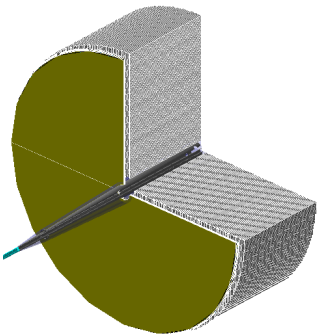
Interested Groups:
Lehigh U., Rutgers U., ISU

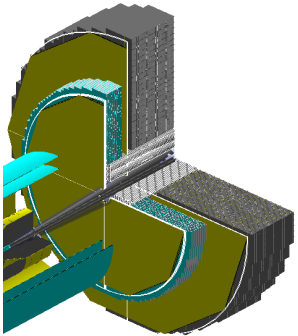
Many open questions:

- Do we want/ can we afford timing layers in front/in between calorimeters?
- Are resolutions of the sPHENIX calorimeter good enough?
- How low in R can we go without impacting the PID detectors?
- Are there other options for the HCal?
- Man-power to build ECal?

Forward calorimetry options







Options for E-Cal:

- Re-use PHENIX Shalik-ECal
- Other re-use or new E-Cal
- Dual read-out

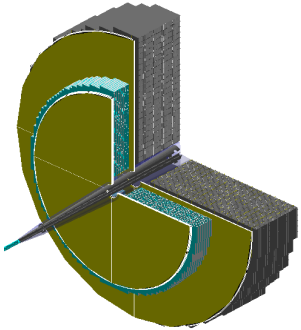
Interested Groups:
ORNL, Sejong U., KNU, Yonsei U., PNU

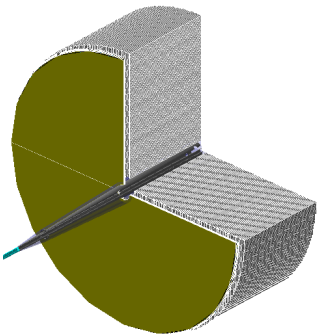
Options for H-Cal:

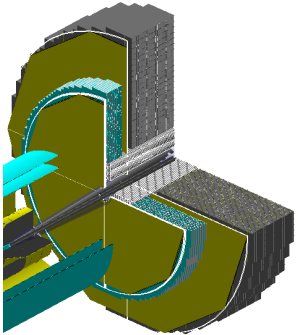
- Re-use STAR forward HCal
- new PSD (SHINE) like - HCal (longitudinal separation)
- Dual read-out
- Hybrid Dual read-out & re-use

Interested Groups:
ORNL, WSU, Sejong U., KNU, Yonsei U., PNU

Forward calorimetry options







Many open questions:

- Do we want/ can we afford timing layers in front/in between calorimeters?
- Can we fulfill the YR requirements with conventional HCals?
- Will Dual readout be ready in time?
- Can we afford a hybrid version or full dual readout calo?
- Which other options do we have for the ECal?

Join us and participate in these important decisions!