



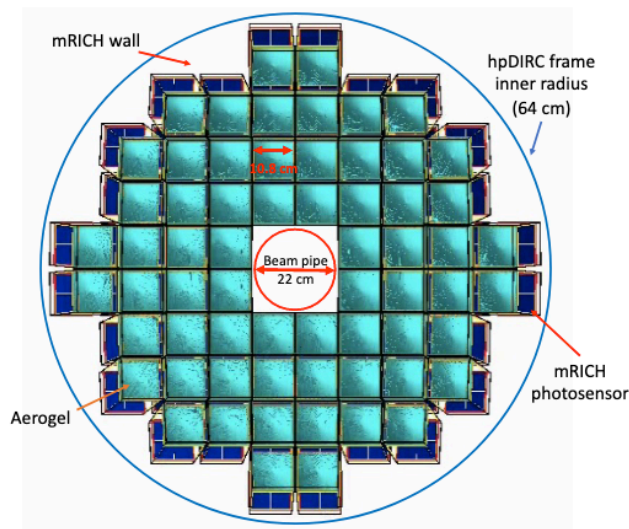
Backwards RICH Review

Joe Osborn on behalf of GD/I
EPIC Collaboration Meeting
January 9, 2023

Remaining EPIC Subsystem Decisions

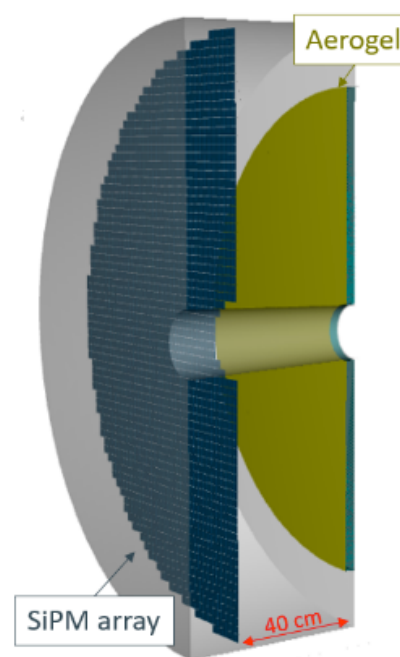
Modular RICH (mRICH)

- Aerogel radiator readout with SiPMs
- Longitudinally compact



Proximity Focusing RICH (pfRICH)

- Aerogel radiator readout with SiPMs
- Gas threshold-based electron ID



Internal EPIC Review Process

- Internal review process nearly identical to barrel EMCaI
- Collaboration review with assistance from external reviewers
 - EPIC GD/I conveners + up to 4 external reviewers + (TBD) EPIC DAQ convener
- Date: March 20-21, 2023
- GD/I meeting to discuss progress on January 30

Information Requested from Proponents

1. Reminder of the proposed **detector configuration** for the use in the ePIC detector.
2. **Input information:**
 1. Pertinent **information on similar technology/design** that is used by other experiments or R&D efforts (example references could be literature or conference talks).
 2. **Prototypes and their tests:** done so far, ongoing effort, future planning (with timelines); results from prototypes and their tests
 3. **Simulation studies:** already performed, ongoing and planned (with timelines); results from the simulations; particular care in (i) showing how realistic the parameters used in simulations are and (ii) reporting what is missing for a fully realistic simulation (backgrounds, specific event categories, ...) (iii) Does the simulation take into account the **realistic response of the selected photosensors and related FEE?**

Information Requested from Proponents

3. Performance:

1. Comparison of the **present assessment of the Cherenkov PID detector performance compared with the YR requirements?**
2. Performance perspectives **beyond the YR requirements (if any) ?**
3. **Efficiency** figures: single particle Pi/Kaon/Proton identified as Pi/Kaon/Proton as a function of the truth momentum in a 3x3-panel figure?
4. **Please quantify the performance for electron/hadron separation**
5. **Active area** or /dead area as 2D function of eta and phi; and comment on the edge effects?
6. **Performance or potential as timing detector, providing both timing resolution and acceptance coverage in eta and phi.**
7. **Under the coordination of the SIDIS working group, provide Kaon Purity in the kinematic region of (x. .. Q2...) via parameterized hadron PID performance.**

Information Requested from Proponents

4. Aerogel Radiator

1. Status of **radiator selection**
2. **Status of the radiator** development and related potential issues?
3. **Perspectives of radiator mass production** and timelines for the production period?

5. Sensors and FEE:

1. Status of **photosensor selection** (a single consolidated option, more options under consideration); please provide photo sensor and pixel segmentation characteristics?
2. **Status of the sensor** development and related potential issues?
3. **Perspectives of sensor mass production** and timelines for the production period?
4. **Characteristics of the ASIC and FEEs** considered?
5. Status of **FEE identification** (a single consolidated option, more options under consideration)? Present a plan for realization on the FEE development in the context of technology choice and in conjunction with the project.
6. Status of the **FEE development** and related potential issues?
7. Perspectives of **FEE mass production** and timelines for the production period?

Information Requested from Proponents

6. Integration:

1. **Status of the proposed detector integration** into the current baseline detector?
 1. z-space and effect to tracking: in coordination with the tracking DWG, produce backward momentum resolution for the tracker that fit into the z-spaced allowed by the proposed RICH detector
 2. Material effect to backward EMCAL: in coordination with the calorimeter DWG, produces electron lineshape in the backward EMCAL with the proposed RICH detector in front.
2. Status of the **design of the electrical/electronic infrastructure** (channels, power supplies, heat, rate)?
3. **Cooling strategies?**

7. Workforce:

1. **List of groups** engaged in the proposed detectors and of other groups potentially interested;
2. **Workforce needed with timelines and qualification of the required professional profiles;** please, include also physicists needed for dedicated simulation studies;
3. **Available workforce** (specifying: granted, expected, possible) by the groups proposing the detector;

8. Cost and scheduling:

1. up-to-date cost estimate for the different components and expenditure categories;
2. In-kind contributions (specifying: granted, expected, possible).
3. Envisioned schedule for full scale production

9. Envisioned risk and risk mitigation strategy

Summary

- Backwards RICH internal review to take place March 20-21 online
- Zoom link and agenda will be distributed to the collaboration in March
- All collaborators are welcome to attend the review
- January 30th - GD/I meeting to discuss progress and status of backwards RICH review preparations