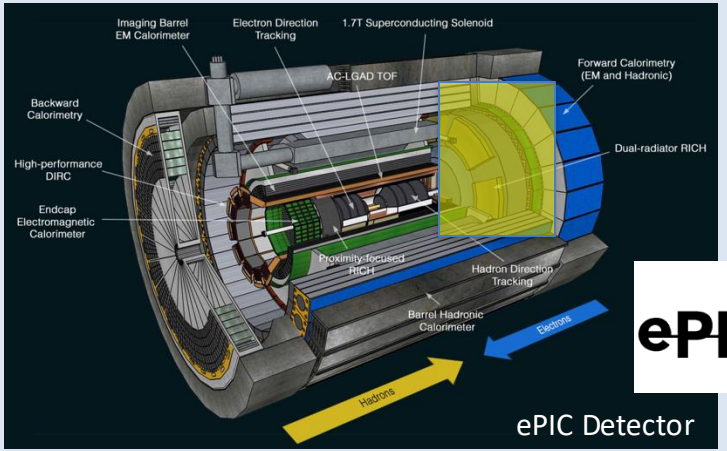
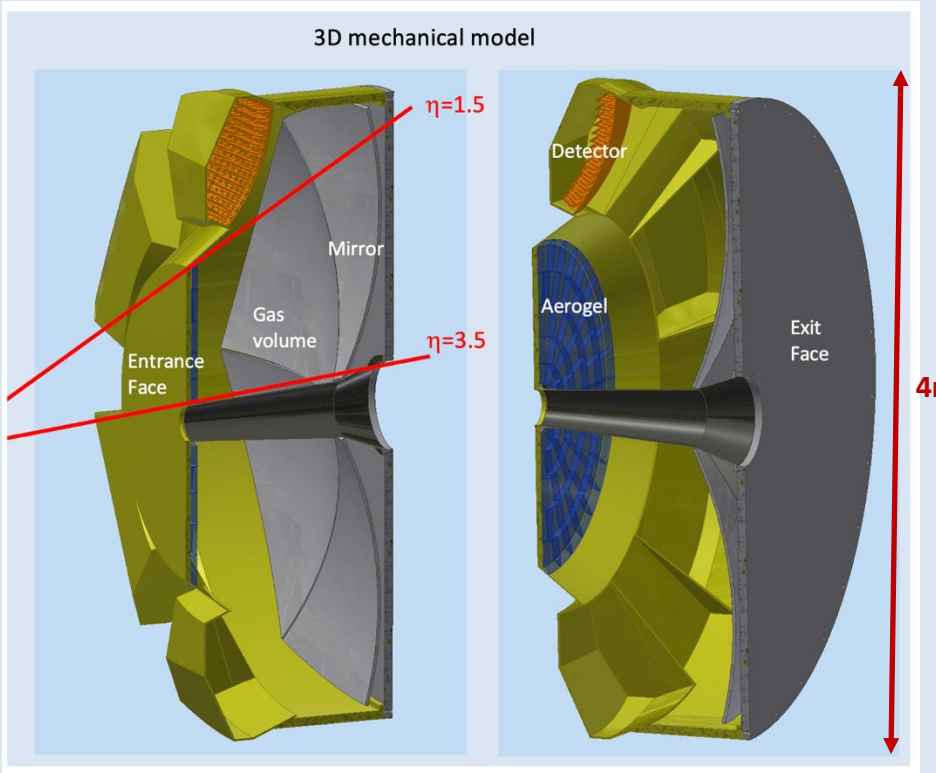


Dual-radiator Ring-imaging Cherenkov Detector (dRICH)

Essential to access flavor information



Goals:

Hadron 3σ–separation between 3 - 50 GeV/c
Complement electron ID below 15 GeV/c
Cover pseudorapidity between 1.5 - 3.5

dRICH Features:

Extended 3-50 GeV/c momentum range --> Dual radiator
Single-photon detection in high Bfield --> SiPM
Limited space --> Compact optics with curved detector

Comments to Version 0.1.2 Many thanks to Prakhar Garg, Chandradoy Chatterjee and David Morrison

Comment on text (Missing references, typos, units, wording,…)
Shorten “status and design effort”

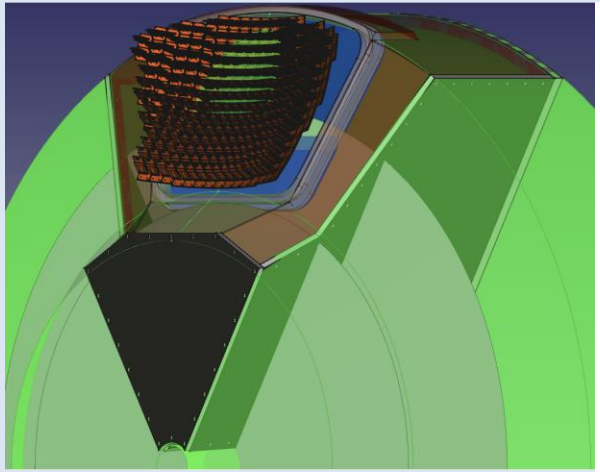
Specify tolerance in contaminants (water, oxygen,..) for the radiators
Describe ambient influence on gas refraction index (e.g. temperarute, pressure)
Discuss the input parameters used in simulations (with respect ongoing R&D status)
Mention: studies on time resolution versus irradiation/annealing
plans for gas transparency measurements
Detail the status of the QA stations
Discuss mirror alignment

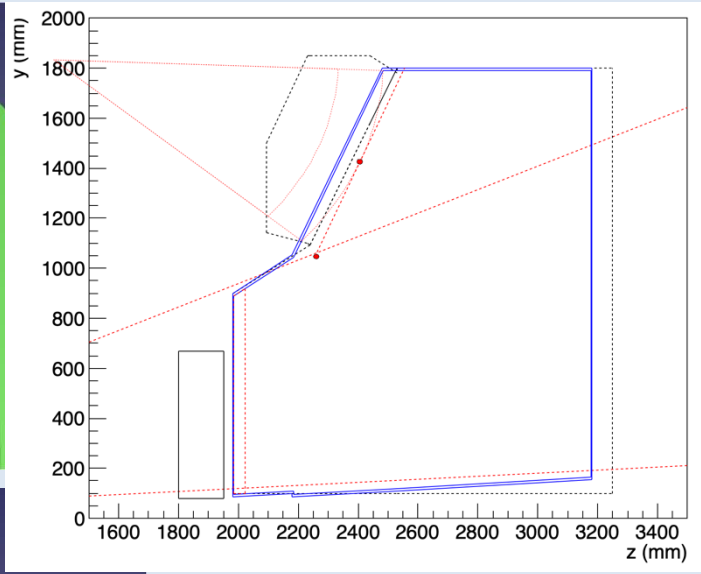
General Indications

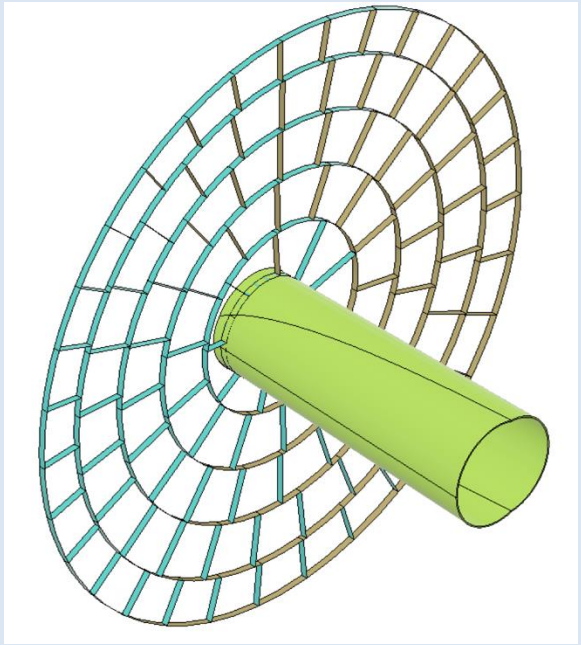
Remove Gantt charts from the "Construction and assembling planning"
Condense in a table the section "Collaborators and their role"
Outline the additional material

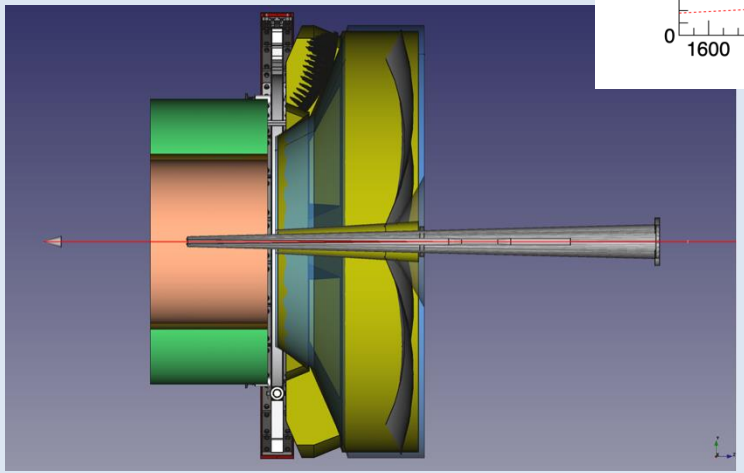
Repository for reference figure preservation

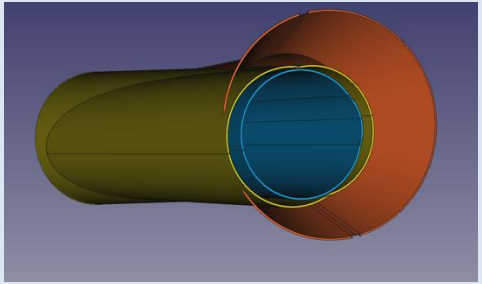
Bridging machanical and simulation model for a new geometry release



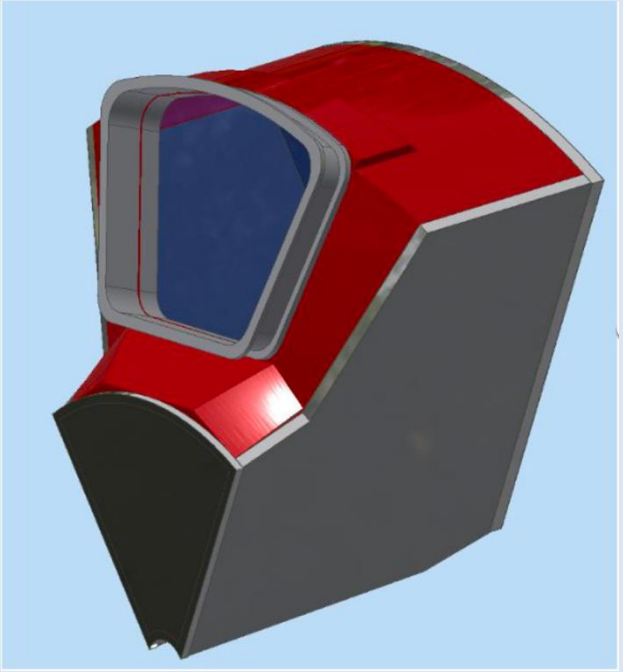




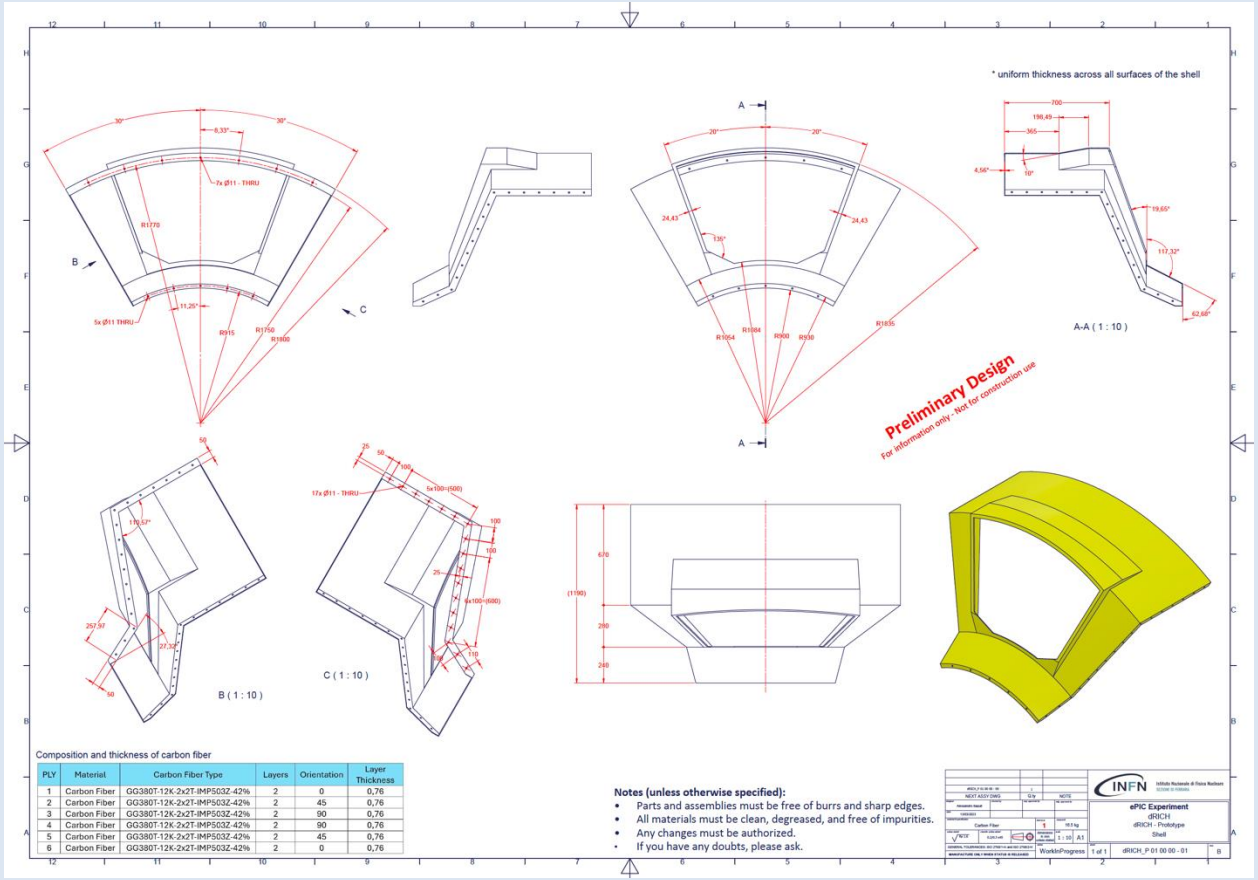




Entering the details of the mechanical model moving towards the executive design of the real-scale prototype



CFRP Layer composition

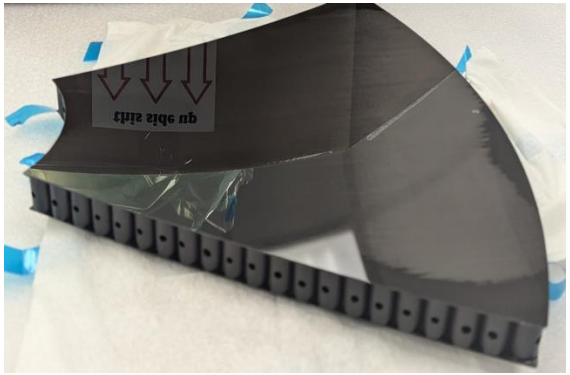


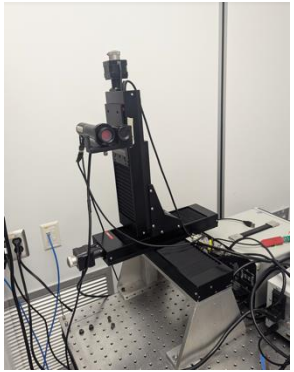
Composition and thickness of carbon fiber

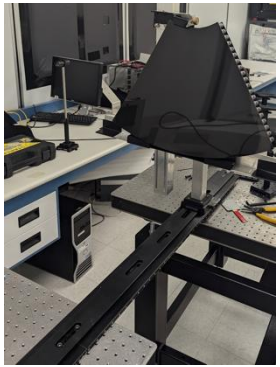
PLY	Material	Carbon Fiber Type	Layers	Orientation	Layer Thickness
1	Carbon Fiber	GG380T-12K-2x2T-IMP503Z-42%	2	0	0,76
2	Carbon Fiber	GG380T-12K-2x2T-IMP503Z-42%	2	45	0,76
3	Carbon Fiber	GG380T-12K-2x2T-IMP503Z-42%	2	90	0,76
4	Carbon Fiber	GG380T-12K-2x2T-IMP503Z-42%	2	90	0,76
5	Carbon Fiber	GG380T-12K-2x2T-IMP503Z-42%	2	45	0,76
6	Carbon Fiber	GG380T-12K-2x2T-IMP503Z-42%	2	0	0,76

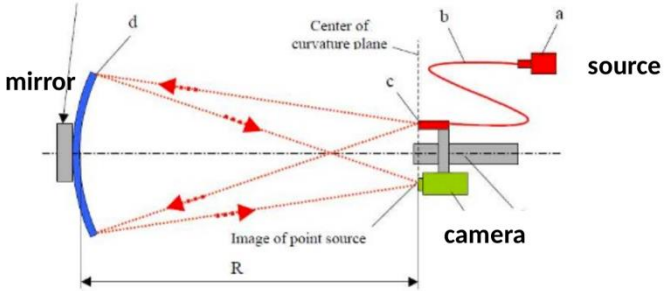
Notes (unless otherwise specified):
- Parts and assemblies must be free of burrs and sharp edges.
- All materials must be clean, degreased, and free of impurities.
- Any changes must be authorized.
- If you have any doubts, please ask.

Characterizing the medium-size (~30 cm side) demonstrator CFRP substrate before coating

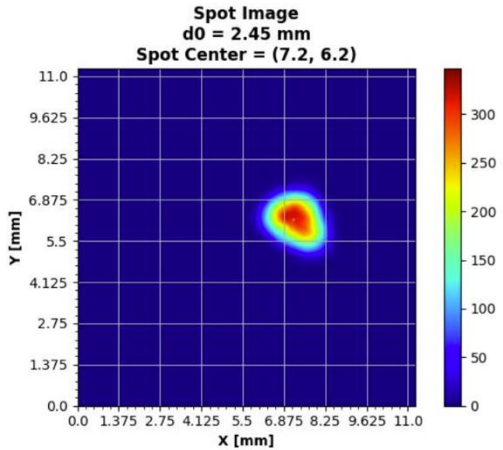


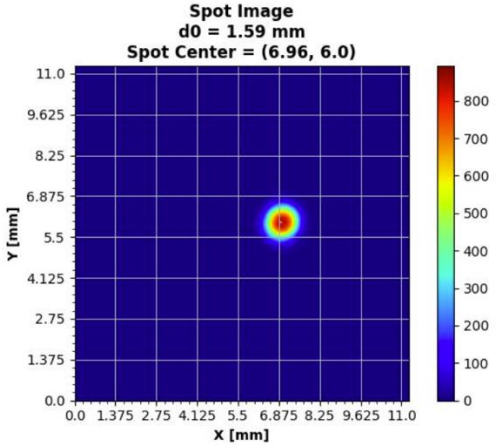


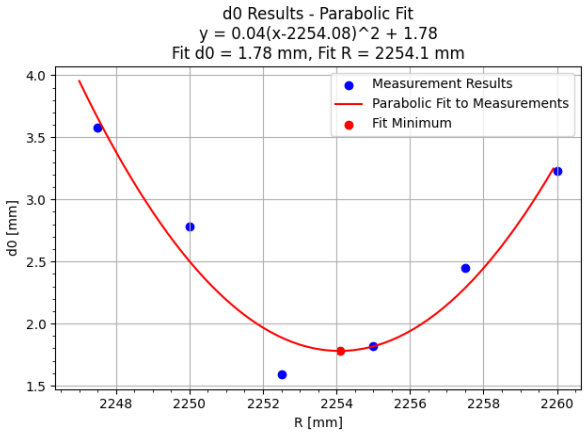




✓ D0 < 2.5 mm ✓ R = 2200 +/- 1%

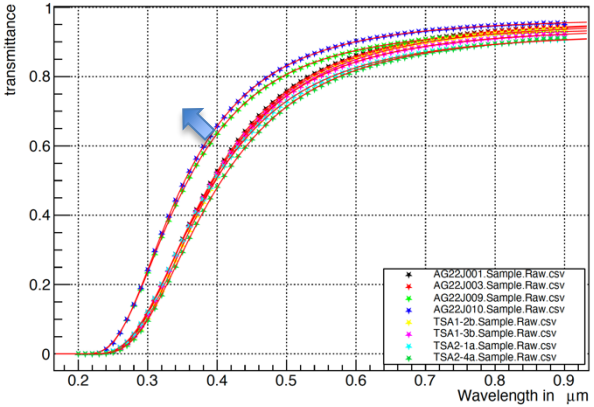






INFN in-kind in synergy with ALICE3

Ongoing: reproducibility at n=1.026



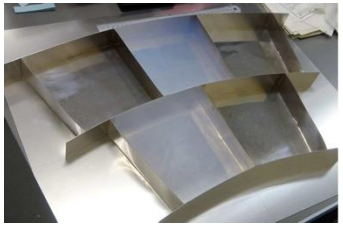
Characterizing n=1.026 and awaiting real-scale demonstartors

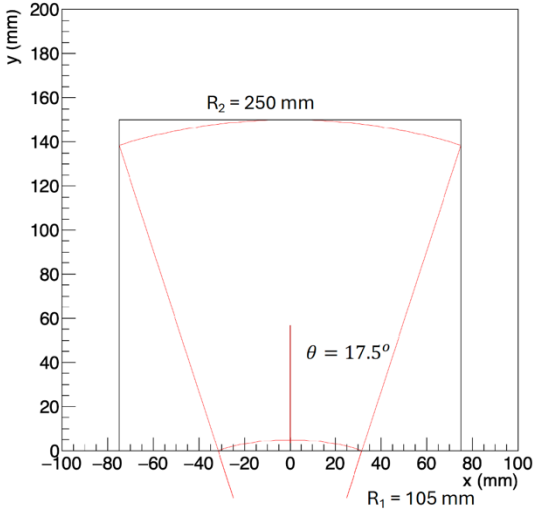
Next step: move to real dimensions & specs

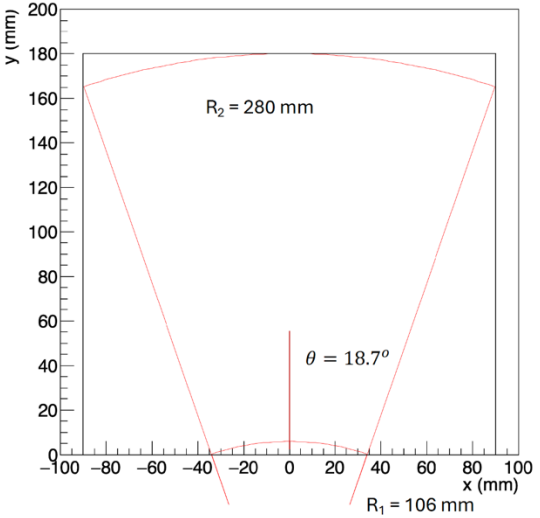
ePIC quality specs: clarity, absorption, planarity, dimension tolerance, …

Squared and water-jet cutting shaped

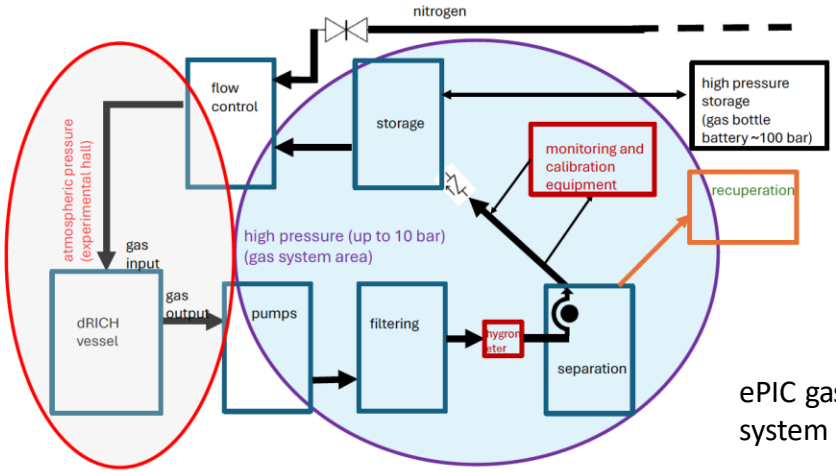
- 15 x 15 x 3 cm2 volume
- 18 x 18 x 2 cm2 volume (BELLE-II standard)





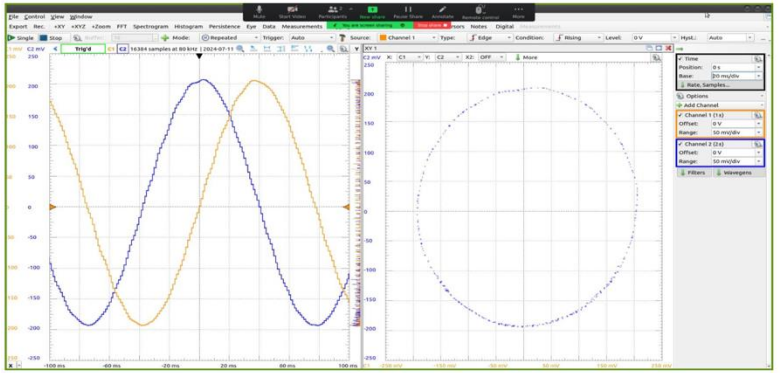


dRICH Gas System



ePIC gas system

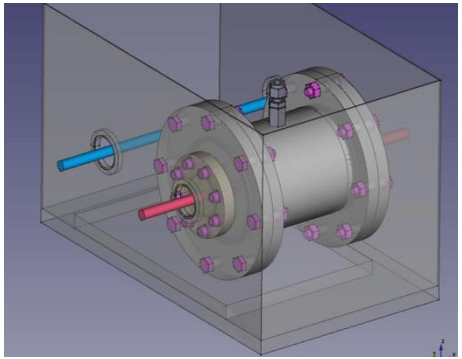
Jamin interferometer for precise n detrmination



Un periodo (360°) corrisponde a 1 ppm di variazione dell'indice di rifrazione
La risoluzione consente la misura di variazioni di n inferiori a 10 ppb

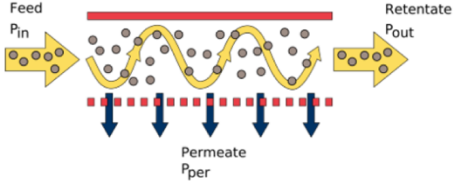
Studying Purging and online Monitoring

High-pressure vessel for light transmission measurements

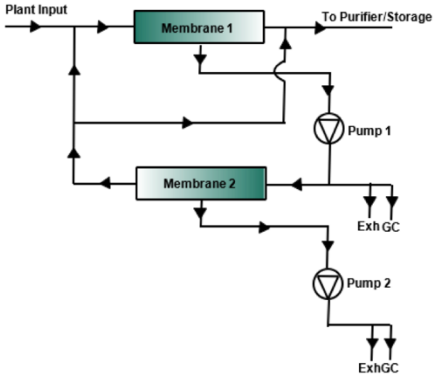


Gas separation via membranes

R. Guida, B. Mandelli, M. Corbetta

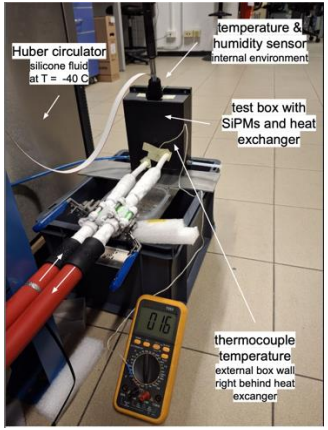


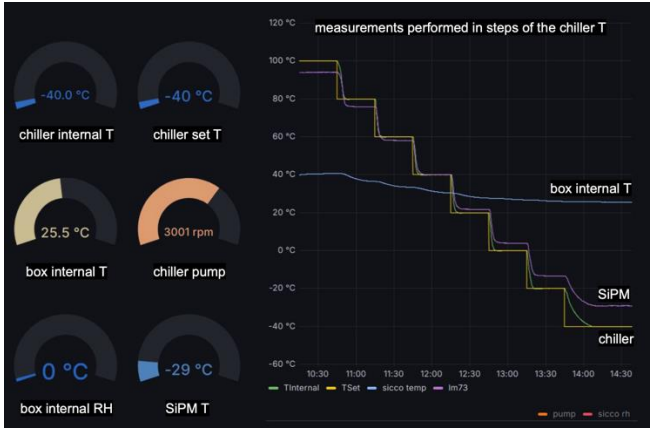
https://edms.cern.ch/document/2816490/1

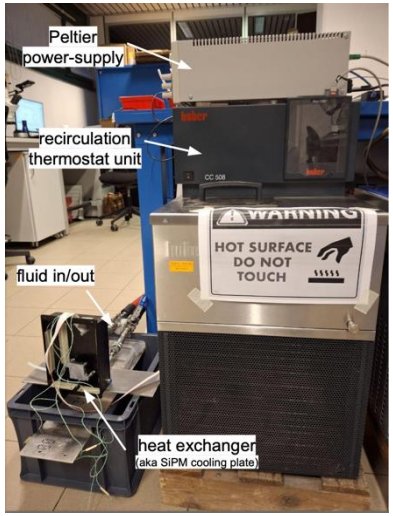


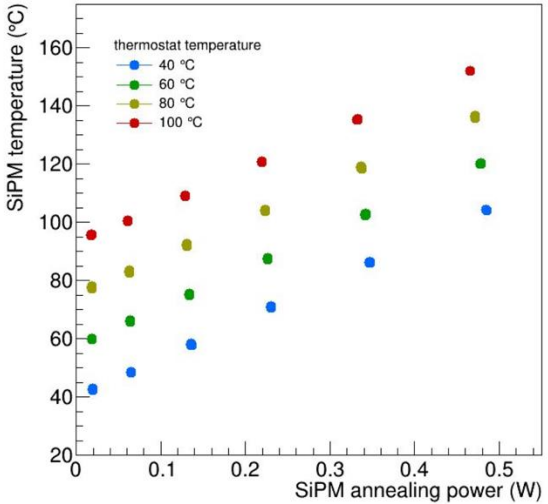
Performing systematic cooling and annealing tests

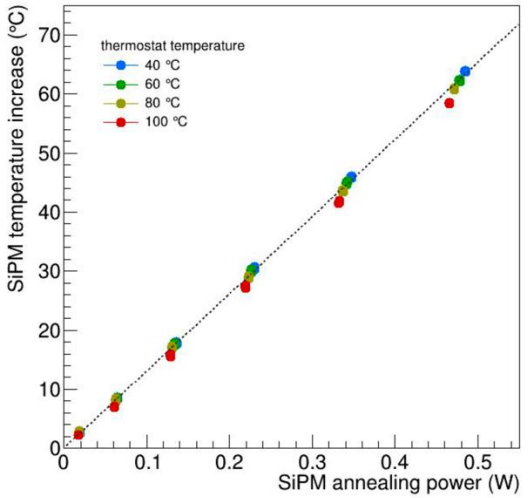
instrumental to optimize protocols, study insulation and safety





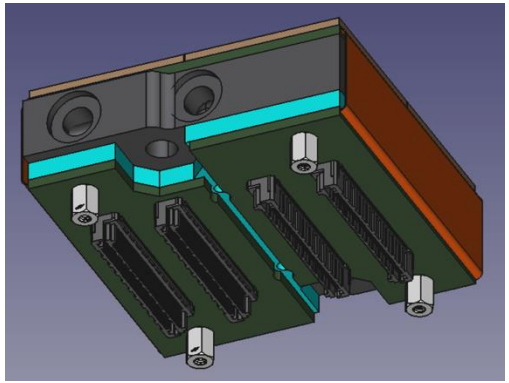


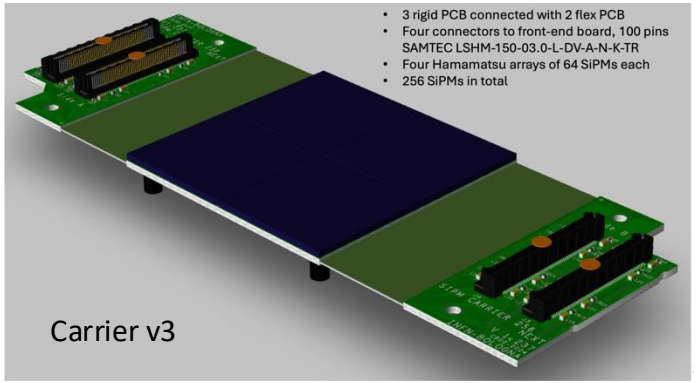


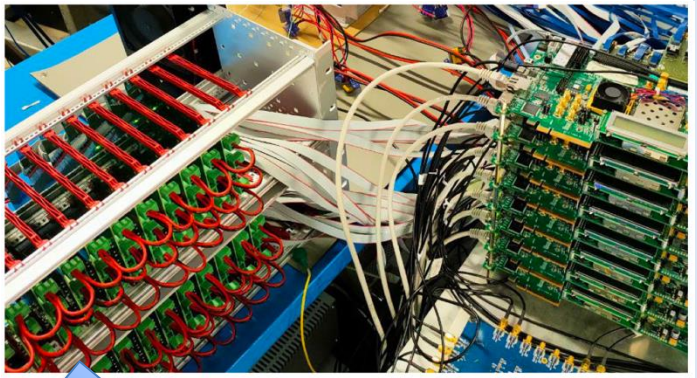


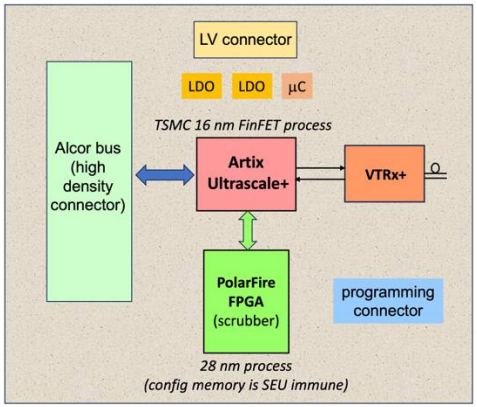
Preparing test production of readout electronics in its “final” ePIC layout

Being superseded by RDO + Master Panel

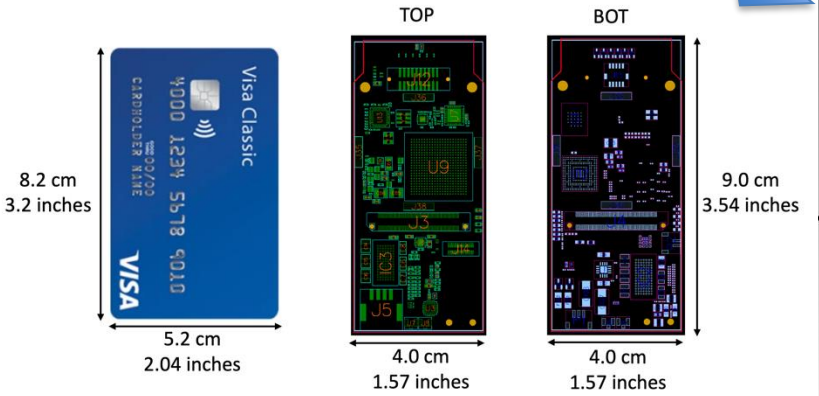


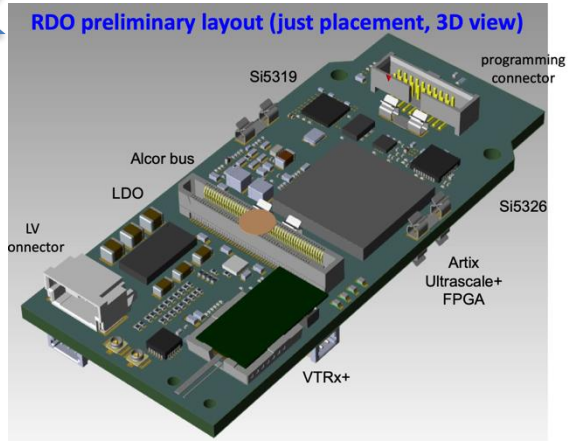






these pictures are on scale!

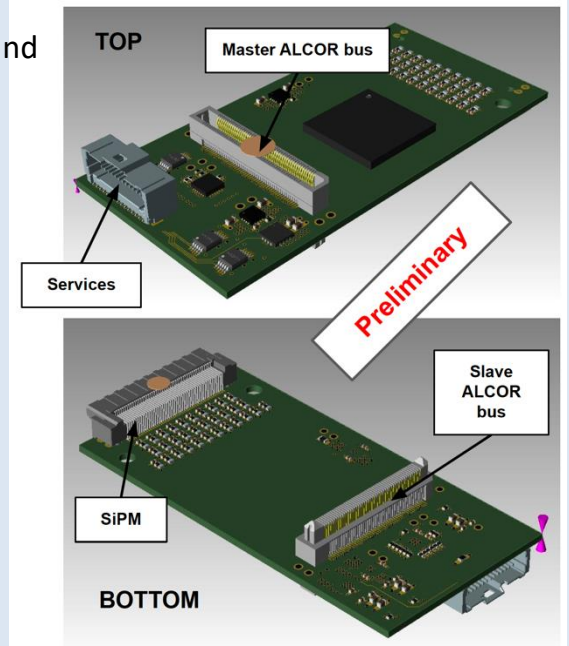




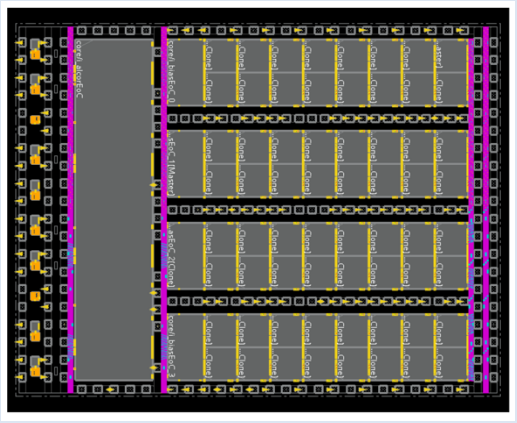
Preparing ALCOR v3 test production

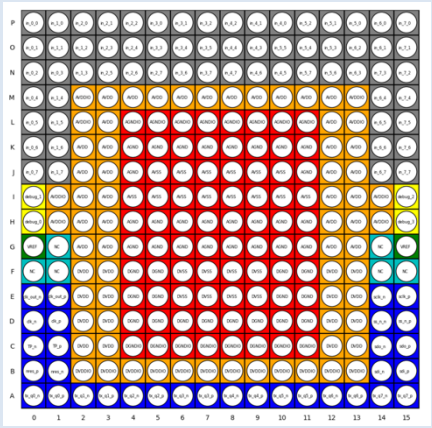
Chip layout + interposer

Font-End Board

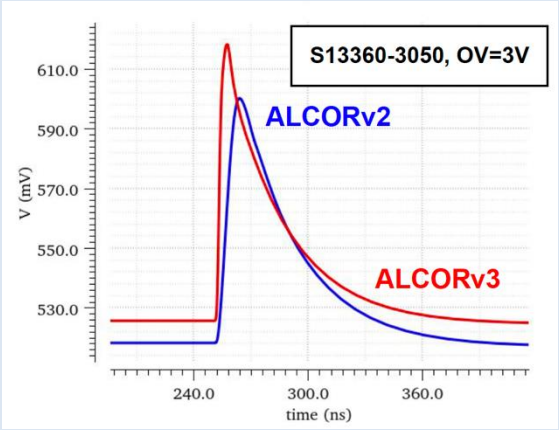


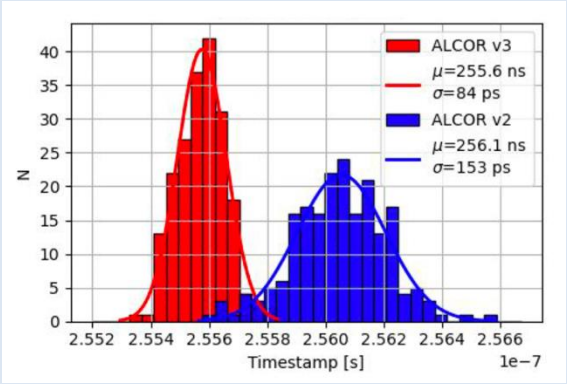
ALCORv64 digitazing chip





Improvements





Pursuing a new irradiation campaign at large

- **neutron irradiation campaign 2024 (LNL-CN)**
  - irradiation done on 9-11 October
  - several SiPM boards, several fluences
  - also irradiated aerogel, quartz and other optical matetials
- **gamma irradiation campaign 2024 (CERN-GIF)**
  - irradiation done on 14-16 October
  - from 10 to 1000 rad
- **proton irradiation campaign 2024 (Trento-TIFPA)**
  - will be done on 12-14 December
  - we will also irradiate several pieces of electronics
  - also irradiated aerogel, quartz and other optical matetials