

ATHENA

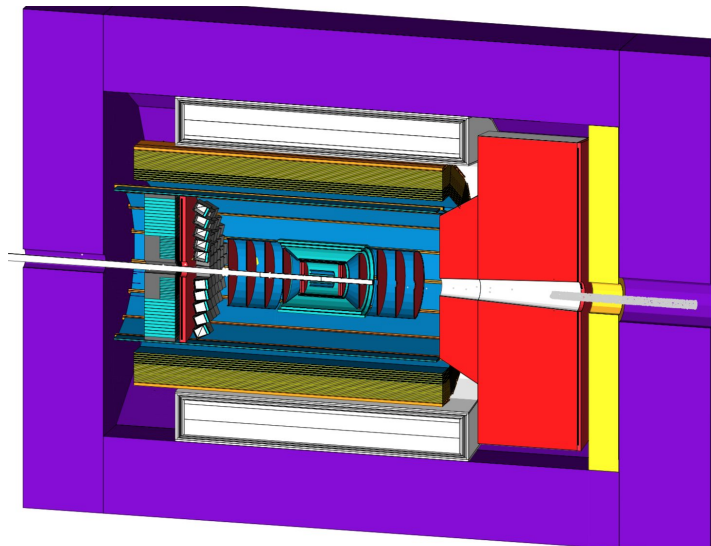
Integration Meeting

Wednesday 2021-08-18

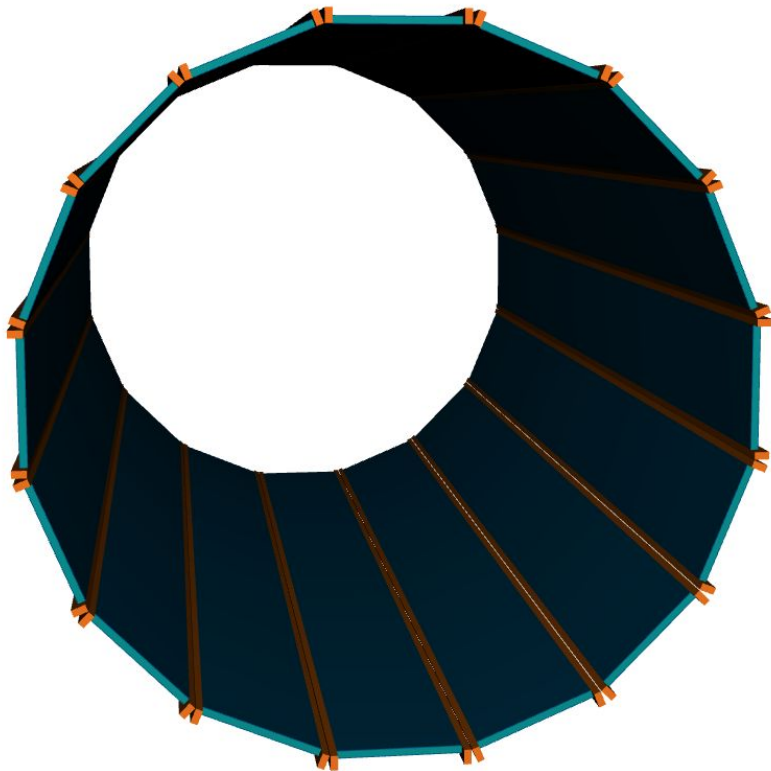
The Software and Computing WG Conveners:
Andrea Bressan (University of Trieste and INFN) ,
Dmitry Romanov (Jefferson lab) ,
Sylvester Joosten (Argonne National Laboratory) ,
Whitney Armstrong (Argonne National Laboratory) ,
Wouter Deconinck (The University of Manitoba)

First tagged release

- N0.0 - B0.0 - P0.0 configuration
- Codenamed “acadia”
 - Preliminary first tag → acadia-v1.0-alpha
- Acadia corresponds to N0-B0-P0 and will keep evolving
 - This way we can keep the git history from becoming non-linear (important!)



FakeDIRC geometry in acadia-v1.0-alpha (N0.0-B0.0-P0.0)



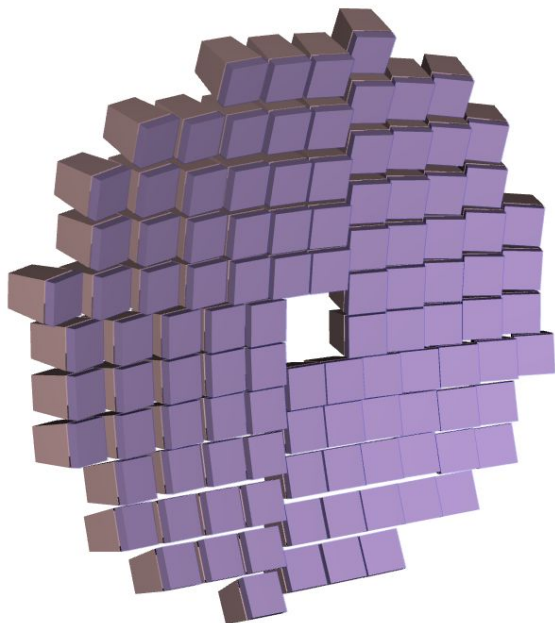
Module layers:

- 2.5mm carbon fiber
- 17mm quartz (sensitive)
- 2.5mm carbon fiber

Support frame

- 30mm x 40mm Stainless Steel bars at both sides of each module
is this reasonable?
- Support frame protrudes a 4cm past the bar end (to account for space required to mount)

mRICH geometry in acadia-v1.0-alpha (N0.0-B0.0-P0.0)



Module layers:

- 1mm CF frame
- 30mm Aerogel
- 2mm foam frame
- 1.52mm Fresnel lens

Box

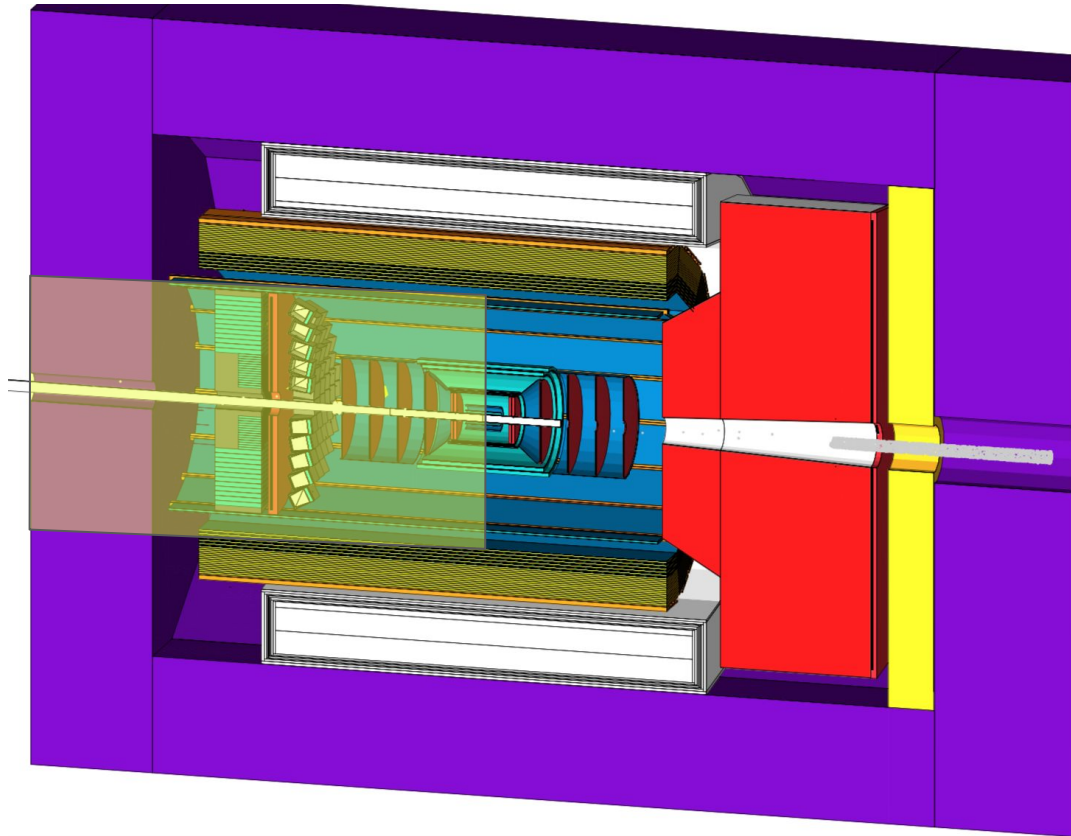
- 2mm thick mirror at sides of box

Photo detector (LAPPD stand-in)

- 2mm glass
- 0.1mm copper (***should be more to also account for HV?***)
- 0.2mm kapton (***flex cables***)
- ***Add silicon as stand-in for readout electronics?***

Currently DIRC boxes floating in space (no support material yet)

Acadia-v1.0-alpha (N0.0-B0.0-P0.0)

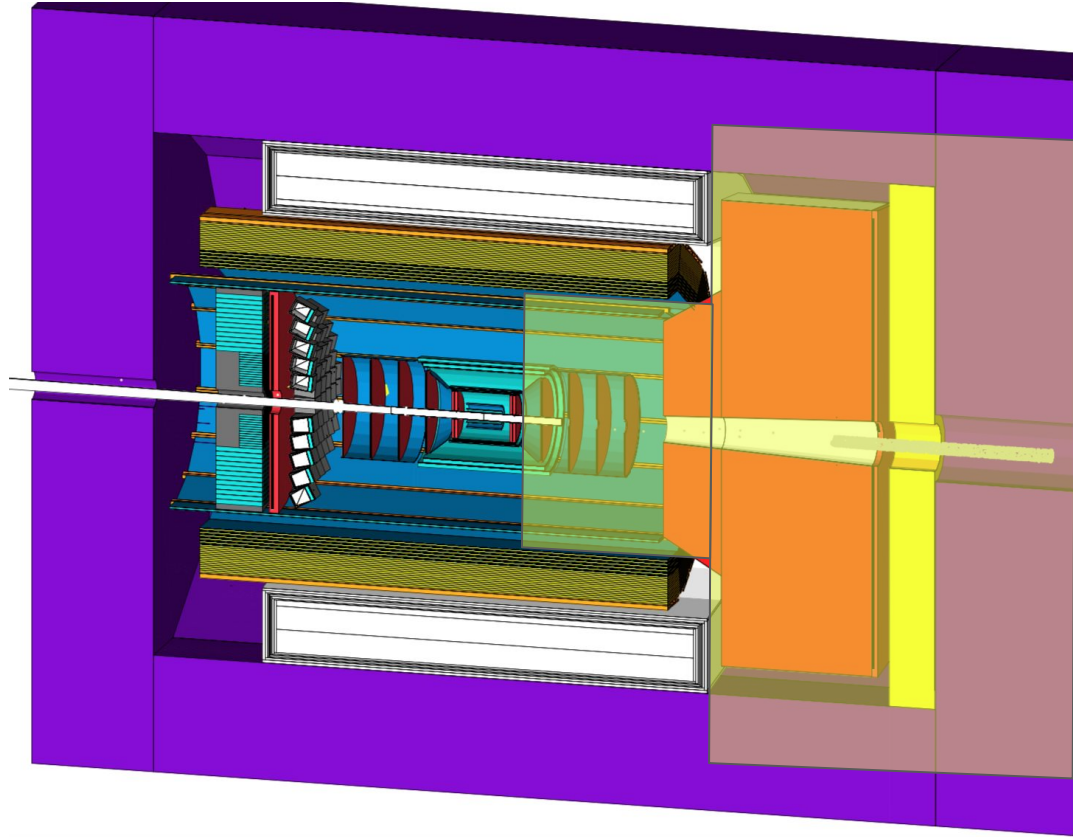


Central tracking (negative half) 0cm to -137cm (Δ : 137 cm) rmin: beampipe, rmax: 95cm
Backward PID: -137 to -177cm (Δ : 40cm) rmin: beampipe, rmax: 95cm
Backward tracking -177cm to -185cm (Δ : 8cm) rmin: beampipe, rmax: 95cm
Backward ECAL -185cm to -245cm (Δ : 60cm) (40cm glass blocks + 20cm for readout) rmin: beampipe, rmax: 95cm
Empty space -245m to -285cm (Δ : 40cm) 30cm for DIRC expansion 10cm service gap
HCAL -285cm to -390cm (Δ : 105cm) (60cm more available in negative direction)

Acadia-v1.0-alpha (N0.0-B0.0-P0.0)



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Central tracking (positive half)
0cm to 155cm (Δ : 155 cm)
rmin: beampipe, rmax: 95cm

Forward PID:
155cm to 335cm (Δ : 180cm)
vessel: rmin: beampipe, rmax 200cm
snout: rmin: bmpp, rmax 92.5 \rightarrow 122.5cm
Snout length: 50cm. **13cm gap between vessel and solenoid cryostat**

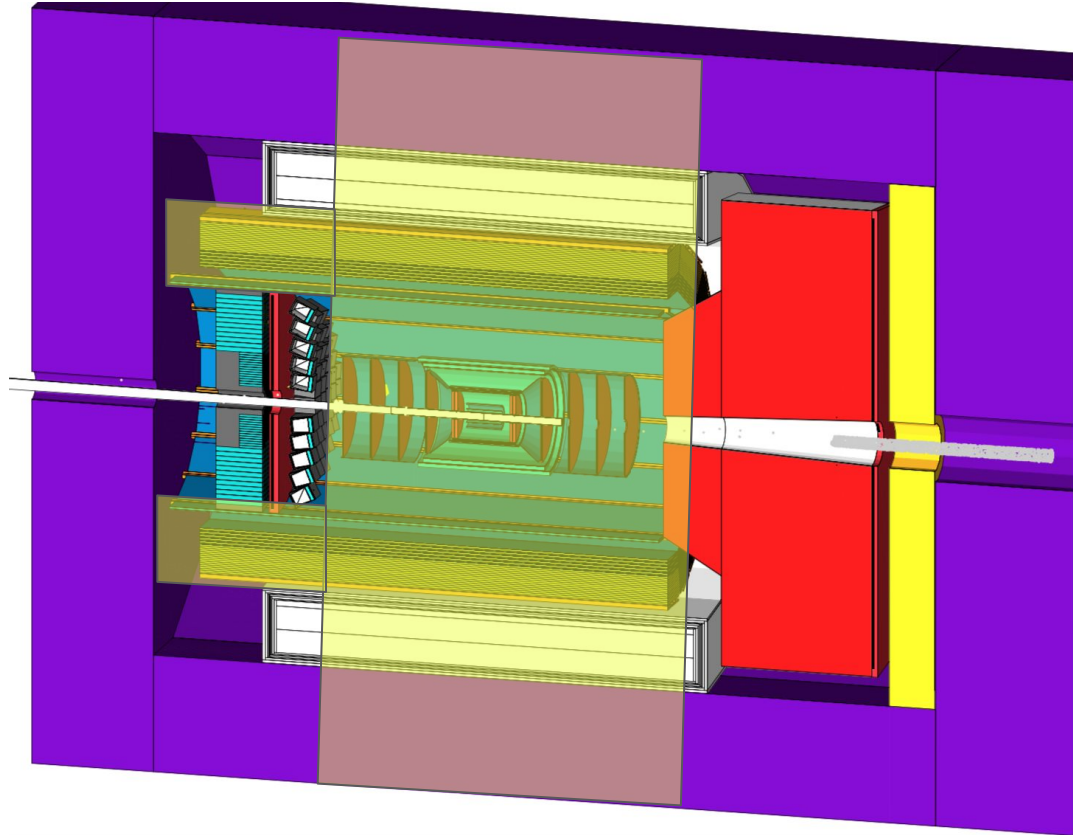
Forward tracking
(needs more space for upgrades!):
335cm to 340cm (Δ : 5cm)
rmin: beampipe, rmax: dRICH rmax

Empty space
10cm service gap

Forward ECAL
350cm to 380cm (Δ : 30cm)
rmin: beampipe, rmax: solenoid rmax

HCAL
380cm to 500m (Δ : 120cm)

Acadia-v1.0-alpha (N0.0-B0.0-P0.0)



Central tracking

-137cm to 155cm (Δ : 155 cm)

rmin: beampipe, rmax: 95cm

(same radial parameters for backward region)

Barrel PID (DIRC, 16 sectors):

-275cm to -155cm (Δ : 430cm)

rmin: 95cm, rmax 105cm (Δ r: 10cm)

space for expansion volume behind BECAL

Space for 10cm service gap in front of HCAL

Empty space for upgrades

rmin: 105cm rmax: 112cm (Δ r: 7cm)

Barrel ECAL (including support)

-245cm to -159cm (Δ : 404cm)

rmin: 112cm, rmax: 159cm (Δ r: 47cm)

Solenoid

-192 to 192cm (Δ : 384cm)

rmin: 160cm, rmax: 224cm (Δ r: 64cm)

Barrel HCAL

-224cm to 324cm (Δ r: 100cm)