
Tracking detector optimization thoughts

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EPIC Detector Tracking WG

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EPIC detector : Optimization of the trackers

Barrel layers:

- 1. Any additional Si/MPGD layers to be added in the barrel region and radius optimization?
- 2. if the decision for the ECAL goes toward the imaging one, we might have more room for tracking as well in the barrel
- 3. If we can increase B, we can re-optimize the configuration (sagitta layers radii, number and position of MPGD layers...)
- 4. Define minimum pT and min #hits for finding a track

End cap trackers:

- No. of Si planes and z position optimized? Do we need additional discs for larger z for pattern recognition
 - ➔ If so, how many and what space point resolution? (i.e Si layers or MPGDs)

Integration:

- we need to justify/revisit the double cone and step structure for the service in the current design.
 - Explore the ATHENA's solution: only one "services exit cone at $\eta \sim 1.1$ ", routing of disk services towards the cone

Joint meeting with Cerenkov PID WG:

- Clarify the tracking requirements for Cerenkov PID ➔ define angular momentum range

Any further thoughts or suggestions?

EPIC detector : AC-LGAD layers

What is the case for AC-LGAD layer in barrel tracker.

1. Does AC-LGAD in barrel region contribute to the tracking

→ momentum resolution

→ Is it for pattern recognition in high background environment? How does that compare with other options

AC-LGAD in End cap trackers: - Basically same questions and

- Does AC-LGAD behind mRICH in electron endcap do any good to tracking (momentum resolution)?
- Does AC-LGAD with 8% material thickness affect the Cerenkov ring seeding for dRICH in hadron endcap or is it negligible?

AC-LGAD with strip segmentation:

- Is it basically a 1D detector? Or a $2 \times 1D$ layer
- Is that accounted for in the momentum resolution study of the tracker?
- Is the segmentation choice driven by the PID requirements?