
Tracking report

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Considerations on the Si vertex and tracker

- Vertex layers
 - The radii need to be adjusted as 5 mm clearance from the beam pipe are needed because of beam pipe backout.
- Tracking layers
 - The material assumed in the ECCE proposal is 0.05% X/X_0 per barrel layer and will check the impacts by switching the sagitta middle layers with the ATHENA design.
 - This need to be updated to 0.55% X/X_0 that is what is suggested by the EIC SC.
- Disks
 - The last disk on both side is currently floating and not supported. Will update the service cone to make the required support connections.
- Hits per track as function of rapidity and p_t or momentum
 - The average number of hits per track in the electron going direction is only 3 hits on average. Will work on the simulation verification.

Considerations on the MPGD tracker

- Detectors
 - ~ Redundancy vs number of hits per track
 - ~ Forward: impact of a MPGD layer beyond the dRICH to be studied
 - ~ Barrel: Technology selection (MM, μ RWELL or both)
- Detector thicknesses
 - ~ Redefine the requirements in material thickness for each MPGD layer in the barrel region based on simulation studies and physic needs
 - ~ Do we need 0.5% MPGD behind DIRC?
- FEE, concentrators, DC-DC...
 - ~ Reference design: 280k channels
 - ~ The large number of channels will translate in a large number of FEE cards.
 - ~ Space limitations to be considered
- Services
 - ~ Review number of detector modules
 - ~ Service routing
- Support structures
 - ~ To be studied

Overall considerations

- Simulations:
 - Review of material budgets
 - Background hits (SR and beam-gas) to be included
 - Track finding algorithm to deal with backgrounds
- Technology reviews
 - We will start a review of the choice of tracking technologies
 - Timelines to CD4
 - Discussion of fallback solutions
- Tight coordination with PID WG
 - Contact liaison on each side
 - Have regular (monthly?) joint meeting with PID
- Requirements inputs from the physics WGs
 - List of key tracking requirements such as momentum resolution, vertex and projection spatial resolutions.

Suggestions/requests to GD/I conveners

- Question:
 - ~ How to integrate/install vs support structures and service routing