First look at IDEA fullSim in DD4hep

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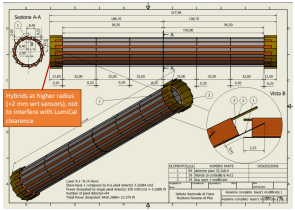
FUTURE CIRCULAR COLLIDER

IDEA vertex detector layout

See Fabrizio's slides for the latest layout

Inner barrel

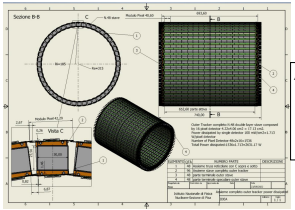


Layer 1
14 overlapping staves of 6 modules each

Power budget of the modules (only) ~23 W

Disclaimer
In this and the following we have made a study of a ***realistic mechanical geometrical layout***, including hybrids and readout bus, but ***still missing*** the final module frame mechanical support

Outer barrel

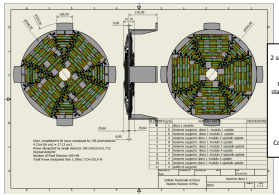


Outer Tracker Barrel
48 staves of 32 modules each (at different radii)

Power budget ~2.63 kW

Cooling using water 4 pipes (2 mm diameter) per stave

Endcaps



Outer Tracker Disk 1
2 sides (front and back) each with 4 petals.

One petal is made of different staves of overlapping modules in z.

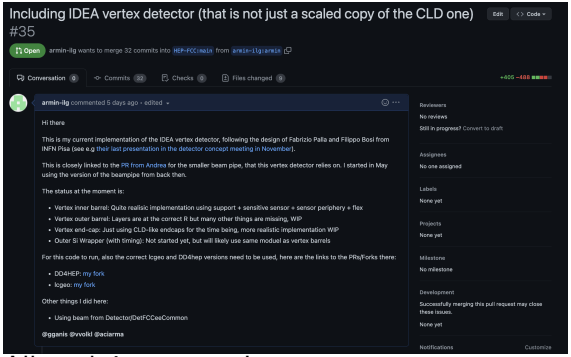
Total modules per disk: 196

Power budget ~340 W

Cooling using 1 water pipe (2 mm diameter)

Pull request

Pull request available at https://github.com/HEP-FCC/FCCDetectors/pull/35

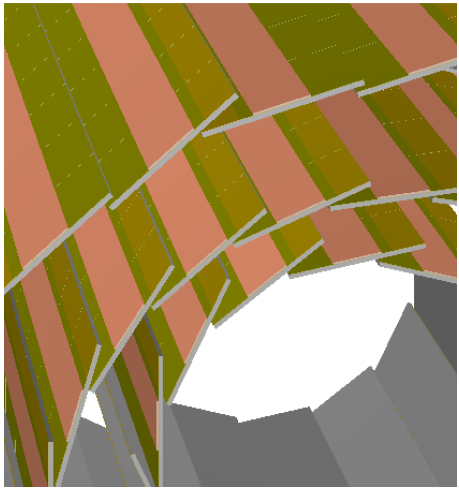


All work in progress!

- Need to make changes in lcgeo as well: Adding new module detector/tracker/VertexBarrel_o1_v01_geo.cpp derived from ZPlanarTracker but adding more complexity/features
- At the moment also change in DD4hep needed (but investigating to circumvent this)

Status of implementation: Inner barrel

- Implemented as stack of support, individual sensor (active and passive periphery) and flex (CLD only has support + one sensor per ladder)
- Not implemented yet: End-of-stave PCB
- Fourth layer to be added in-between inner and outer barrel (waiting for details from designers)

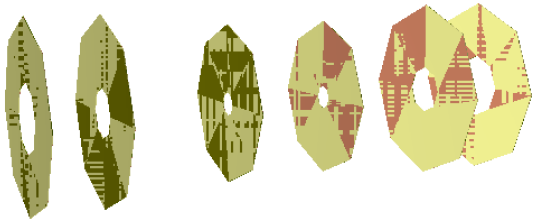


Status of implementation: Outer barrel

- Same implementation as inner barrel
- Not included yet: Complex support structure in-between layers and cooling pipes

Status of implementation: End-caps

- Currently just moved/scaled CLD disk implementation
- Plan to actually build modules out of sensors, support and flex
- Modules of different sizes
- Place according to design



Thanks!