

# AHCAL simulation in ILD

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# Overview of ILD-AHCAL Software

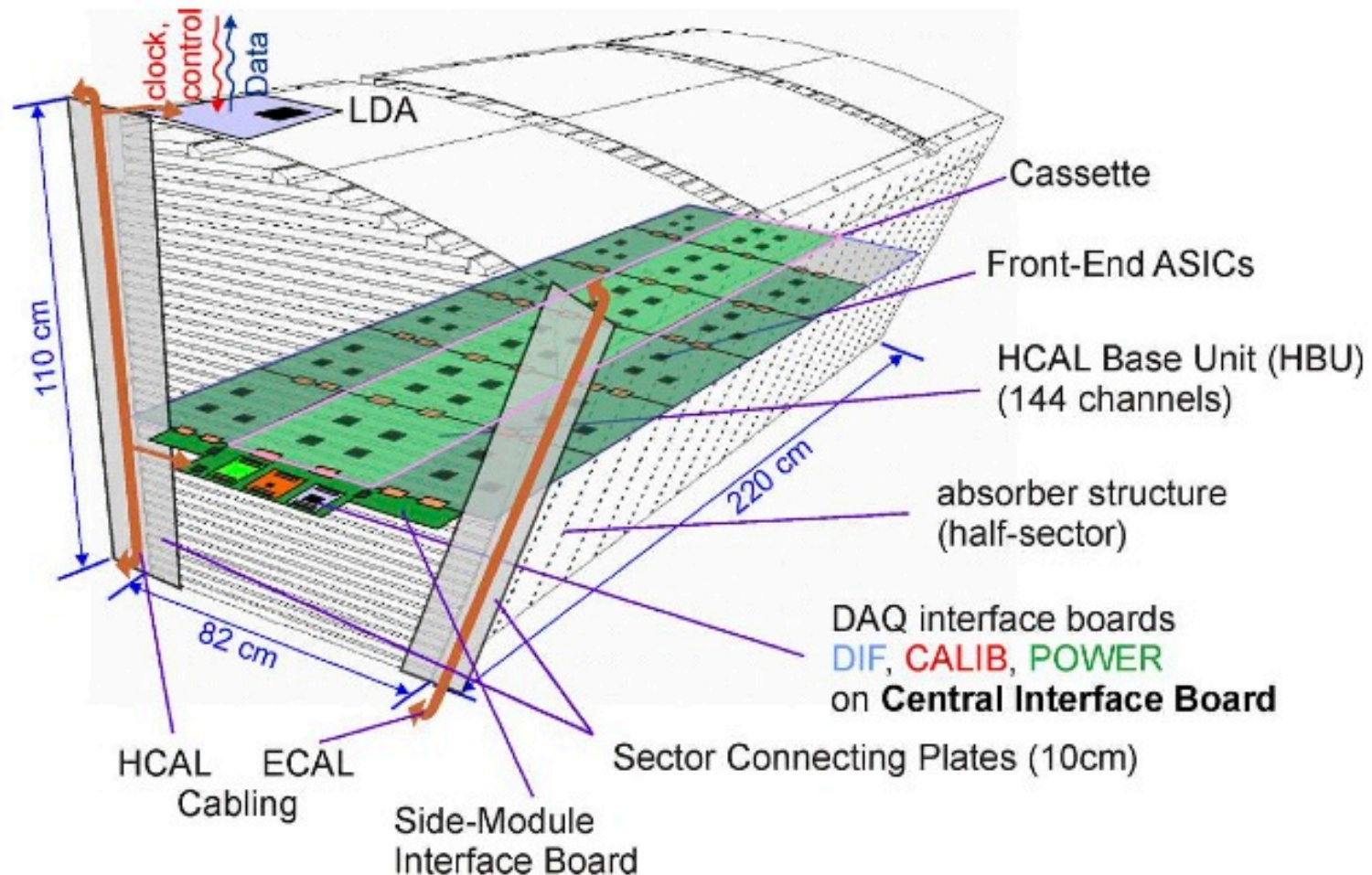
Mokka	Reconstruction software	Analysis
<ul style="list-style-type: none"><li>• <b>TESLA geometry:</b><ul style="list-style-type: none"><li>• high degree of realism (support structures, gaps, electronics, services)</li><li>• used for LOI</li></ul></li><li>• <b>Birks law</b> (saturation effect in the scintillators)</li></ul>	<ul style="list-style-type: none"><li>• <b>Digitizer:</b> <i>NewLDCCaloDigi</i> (Marlin processor)</li><li>• <b>Pandora PFA</b> (see talk of John Marshall)</li></ul>	<ul style="list-style-type: none"><li>• <b>Energy resolution</b></li><li>• <b>Physics studies</b></li></ul>

- Not necessary to include tiles non-uniformity (see arXiv 1006.3662)

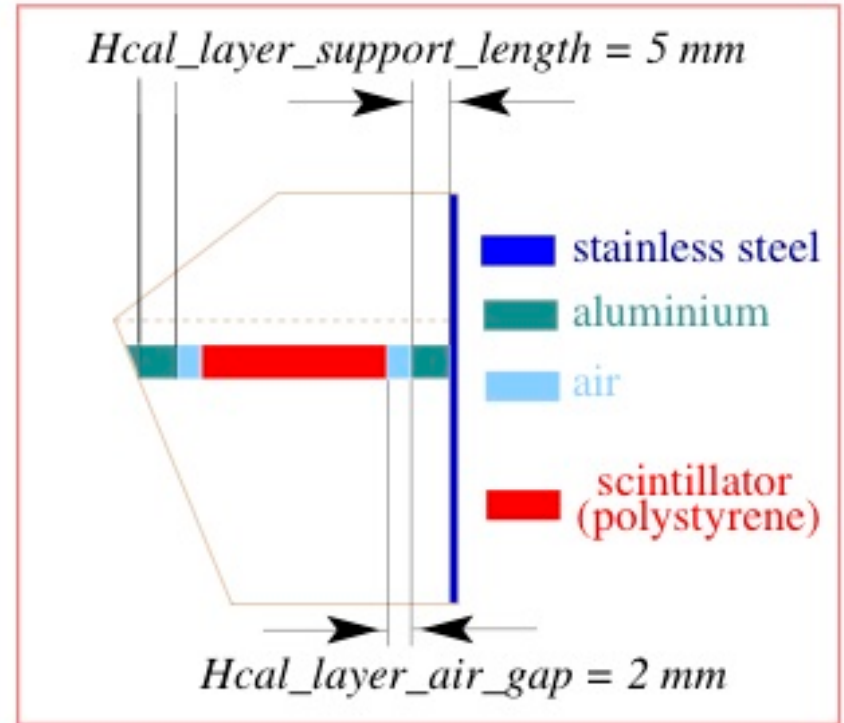
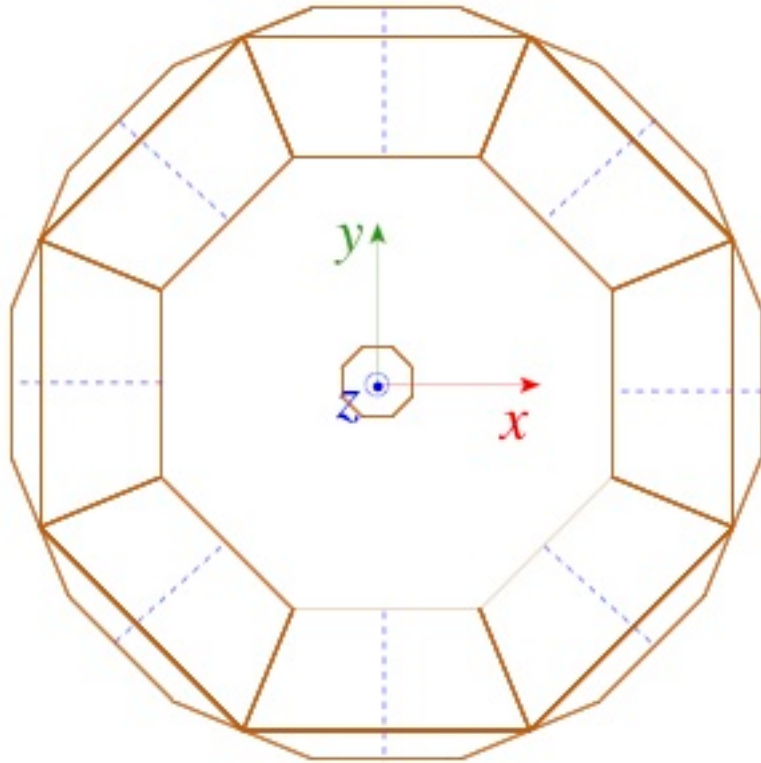
- **Validated with test beam data**

# AHCAL barrel design

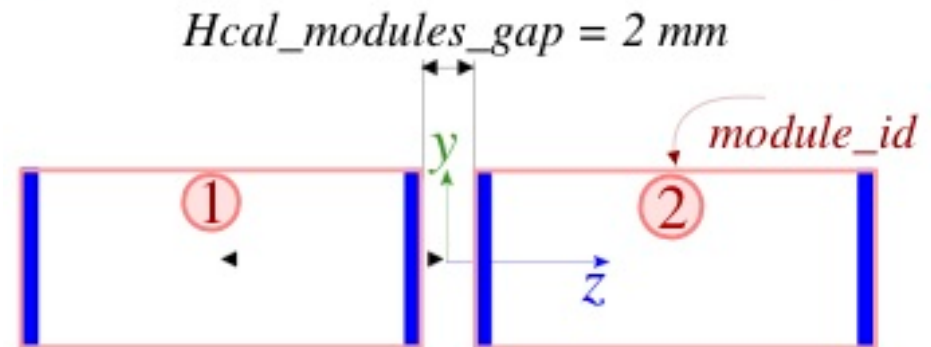
- Electronics integrated into absorber structure
- Basic electronic unit (HBU): 36 x36 cm<sup>2</sup> (144 tiles)



# AHCAL implementation in Mokka

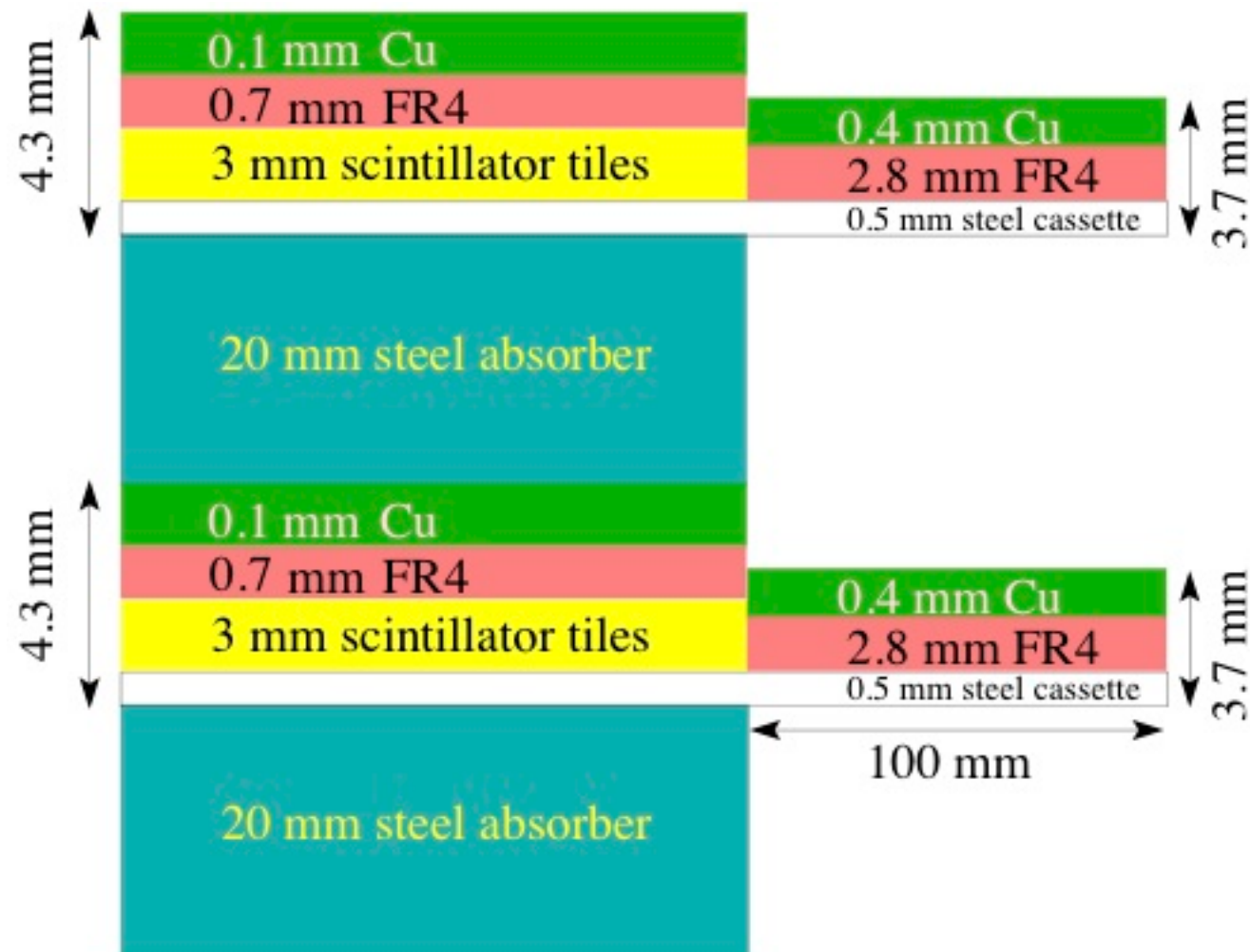


- Implemented: gaps between staves, gaps between modules along z, layer support structure, air gap
- Detailed description in Linear Collider note LC-TOOL-2008-001



# HCAL electronics

- Electronics implemented in the Mokka



# ECAL-HCAL services

- Gap between barrel and endcaps used to guide ECAL/HCAL cables

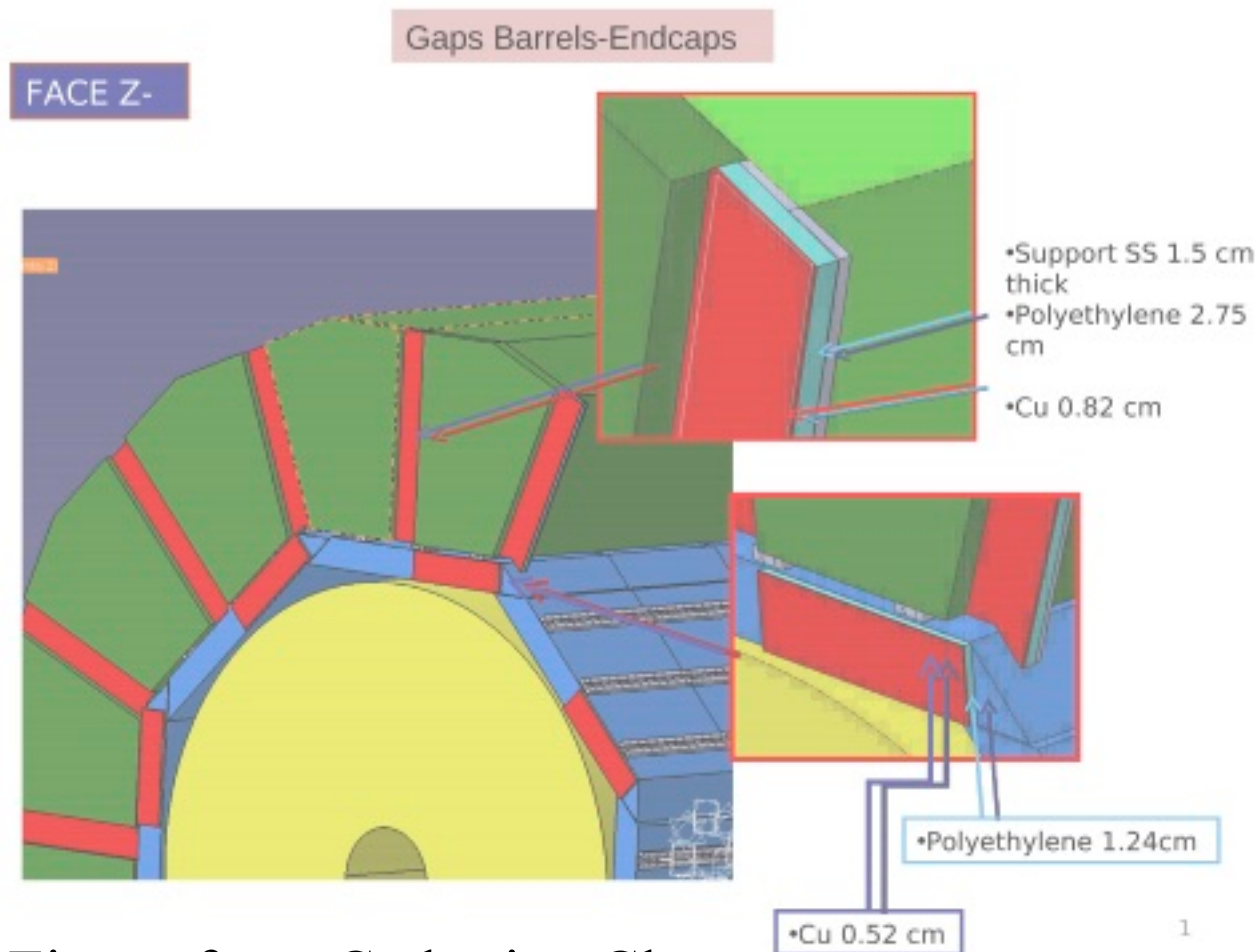
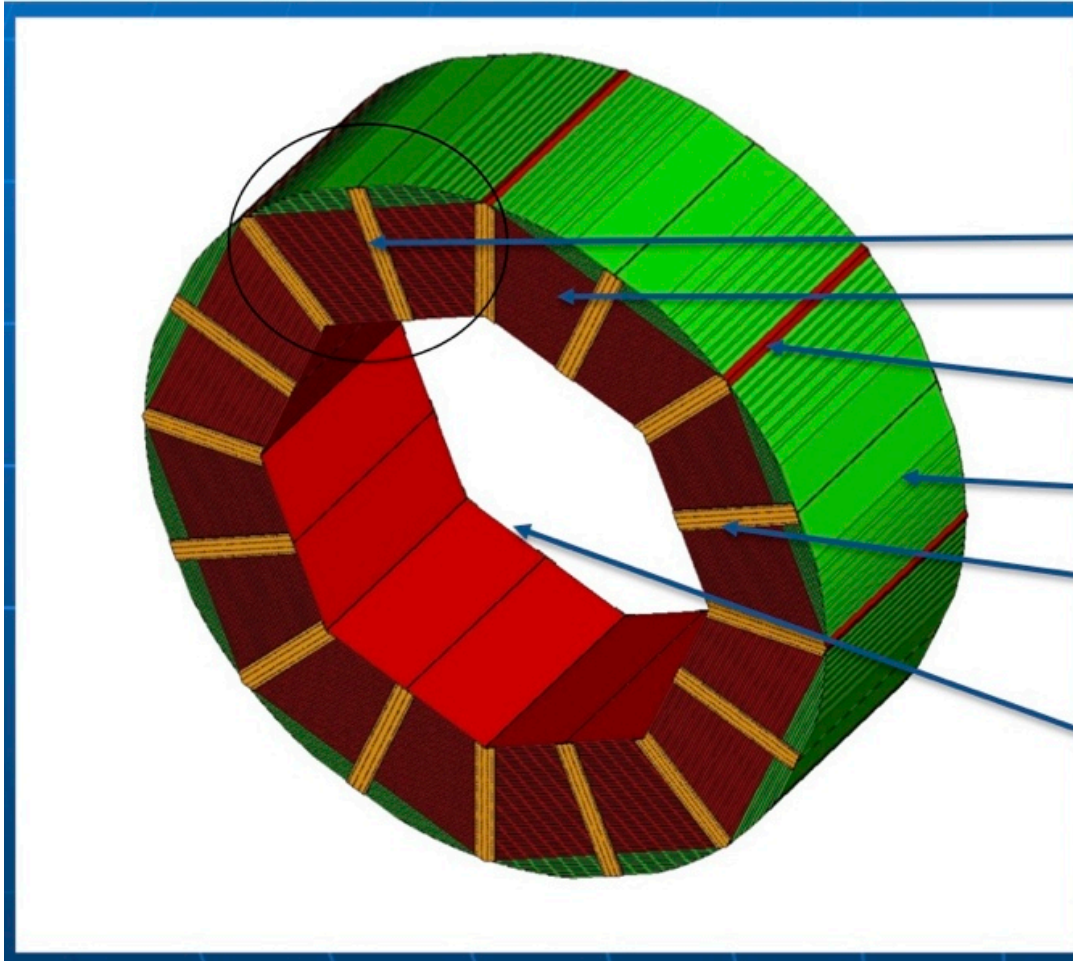


Figure from Catherine Clerc



# AHCAL mechanical design



- AHCAL half barrel absorber structure
  - 8 module per half barrel
  - 2 sub-module per module
    - with 40 layers -> 5,171 l
  - 2 side plates per sub-module
    - thickness 5 mm
  - 16 backpacks
    - with 8 layers -> total 5,731 B l
  - 32 connector plates on front and backside
    - thickness 15 mm
    - width 200 mm
  - 16 back plates to fill the gap between half barrels
    - thickness 15 mm

- Plan: to include in the Mokka driver Fe plates to fill the gap in z, revise the active gap, and the overall outer dimensions

# Summary

- With respect to LOI, more realism by inclusion of AHCAL electronics and services
- Tested and debugged Mokka driver exists
- Digitizer and reconstruction code are part of the standard reconstruction chain