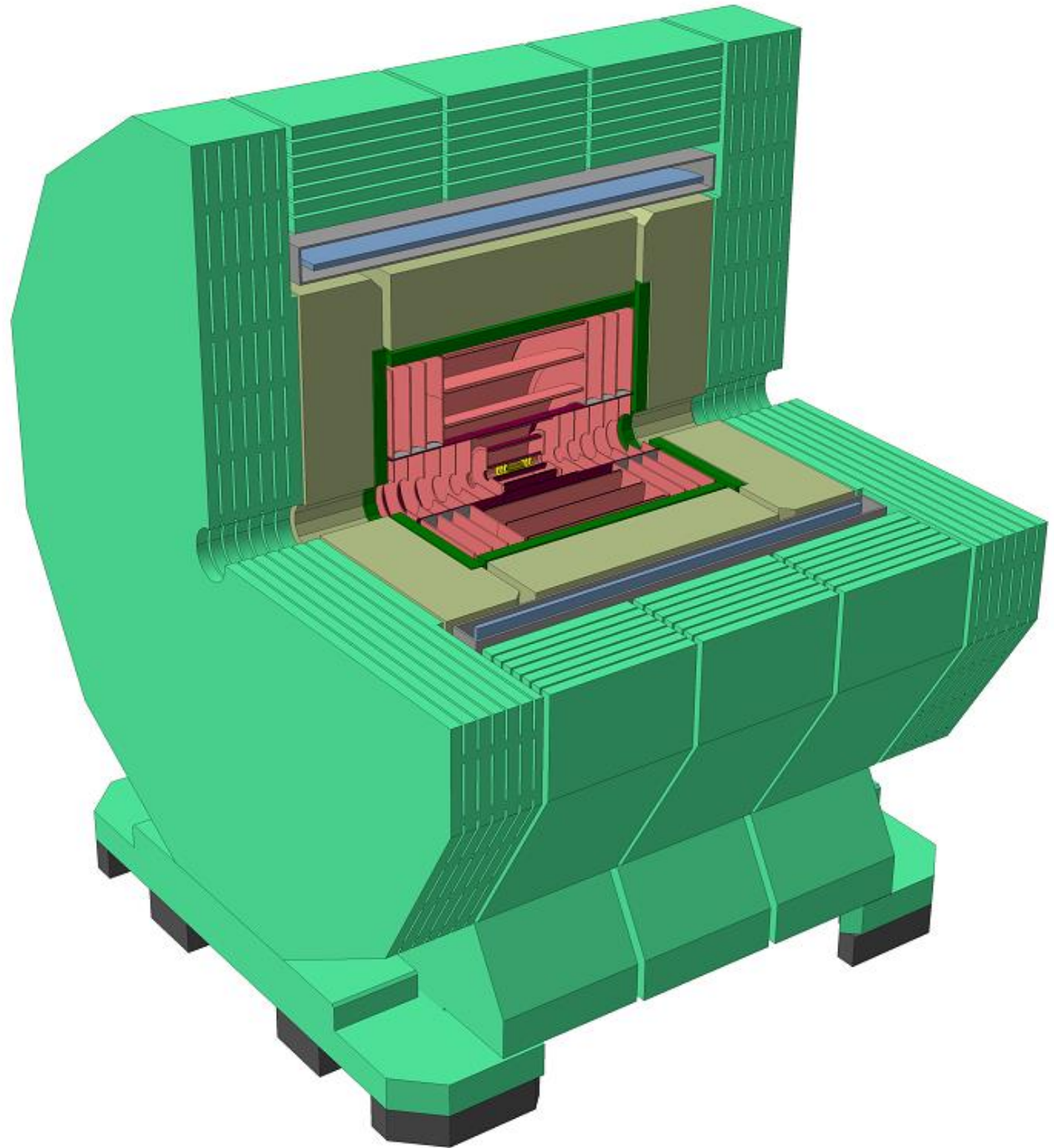


CLD and MDI at FCC-ee

Konrad Elsener, CERN

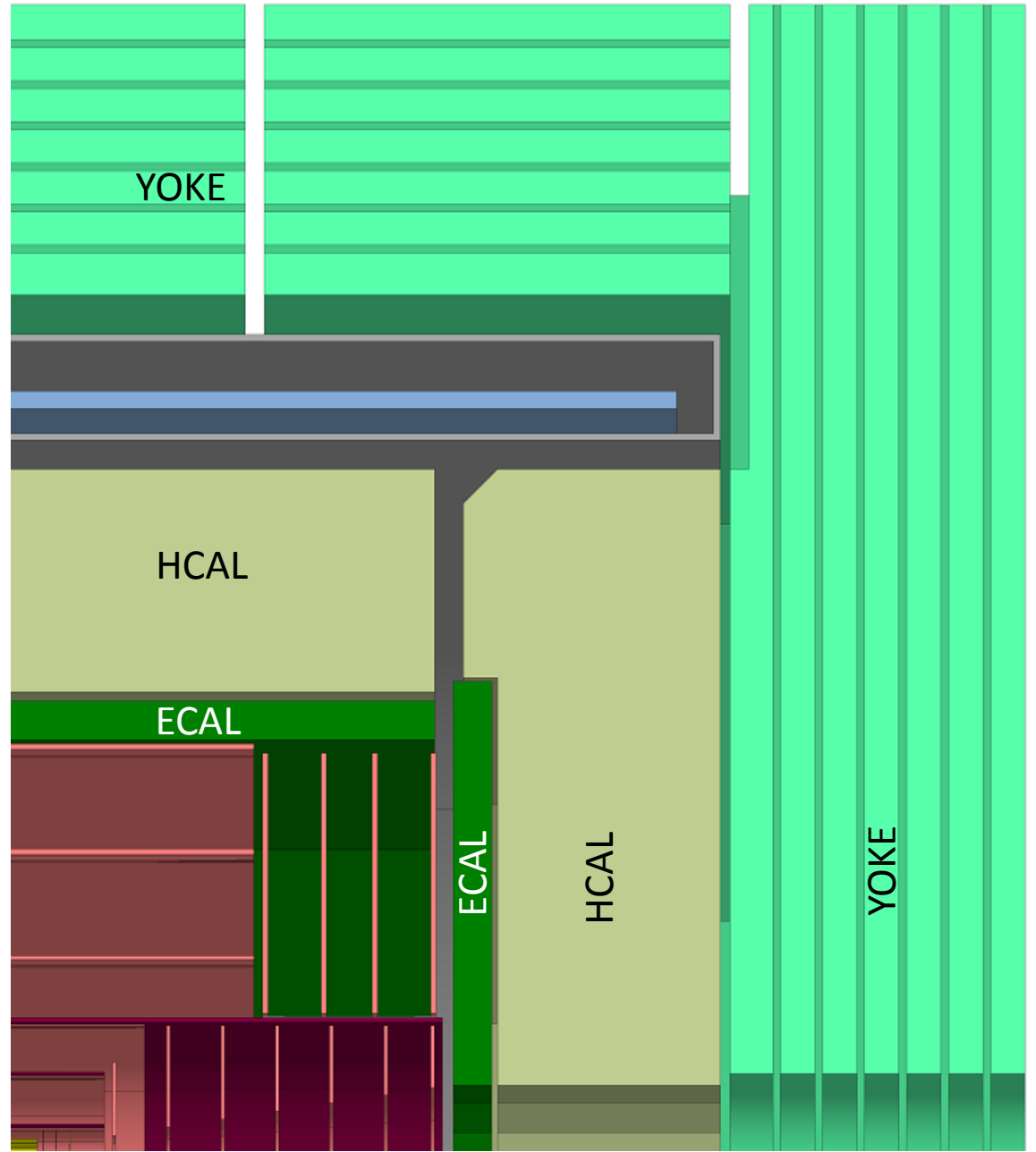
10 September 2018

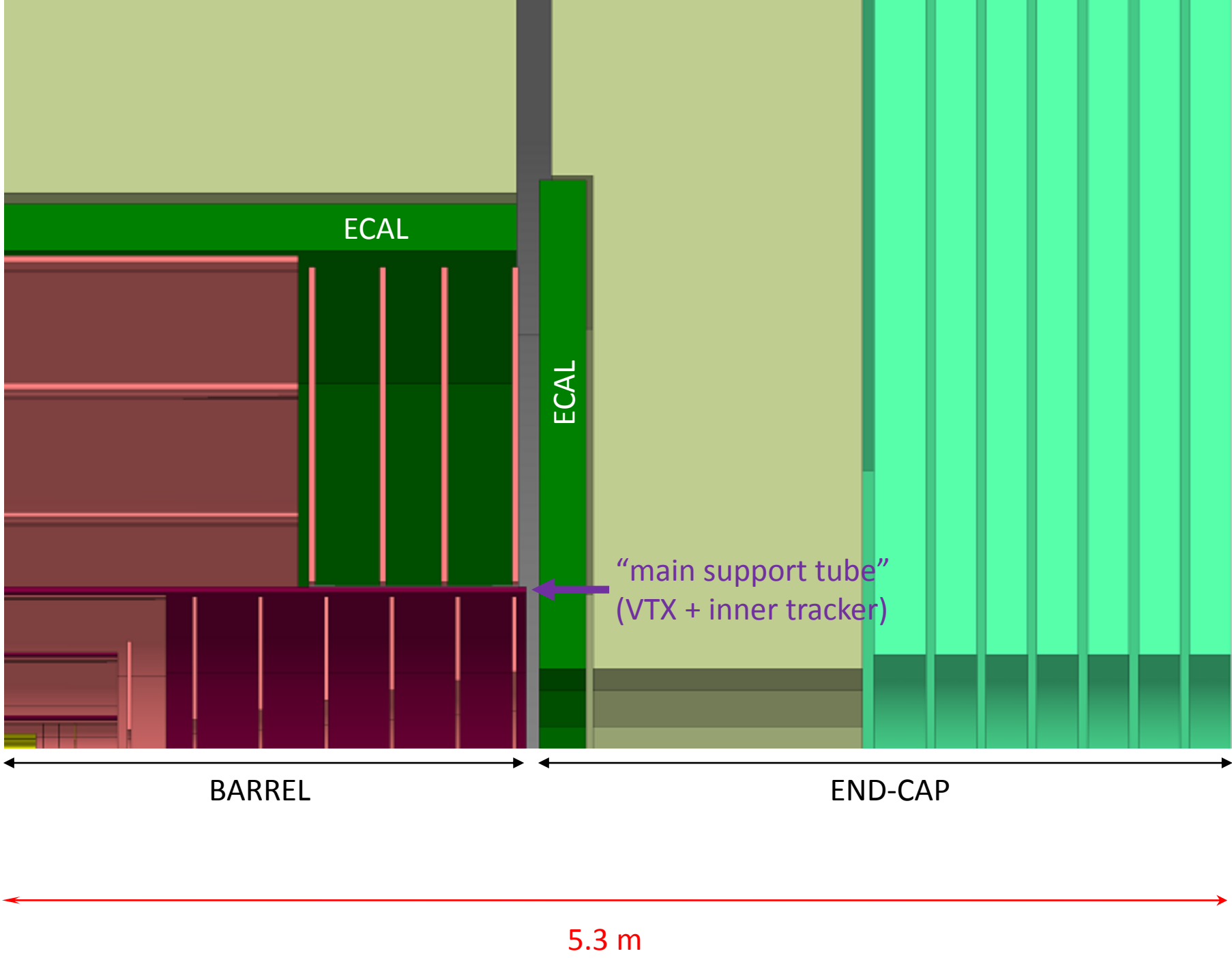
CLD
("CLIC-like
detector")

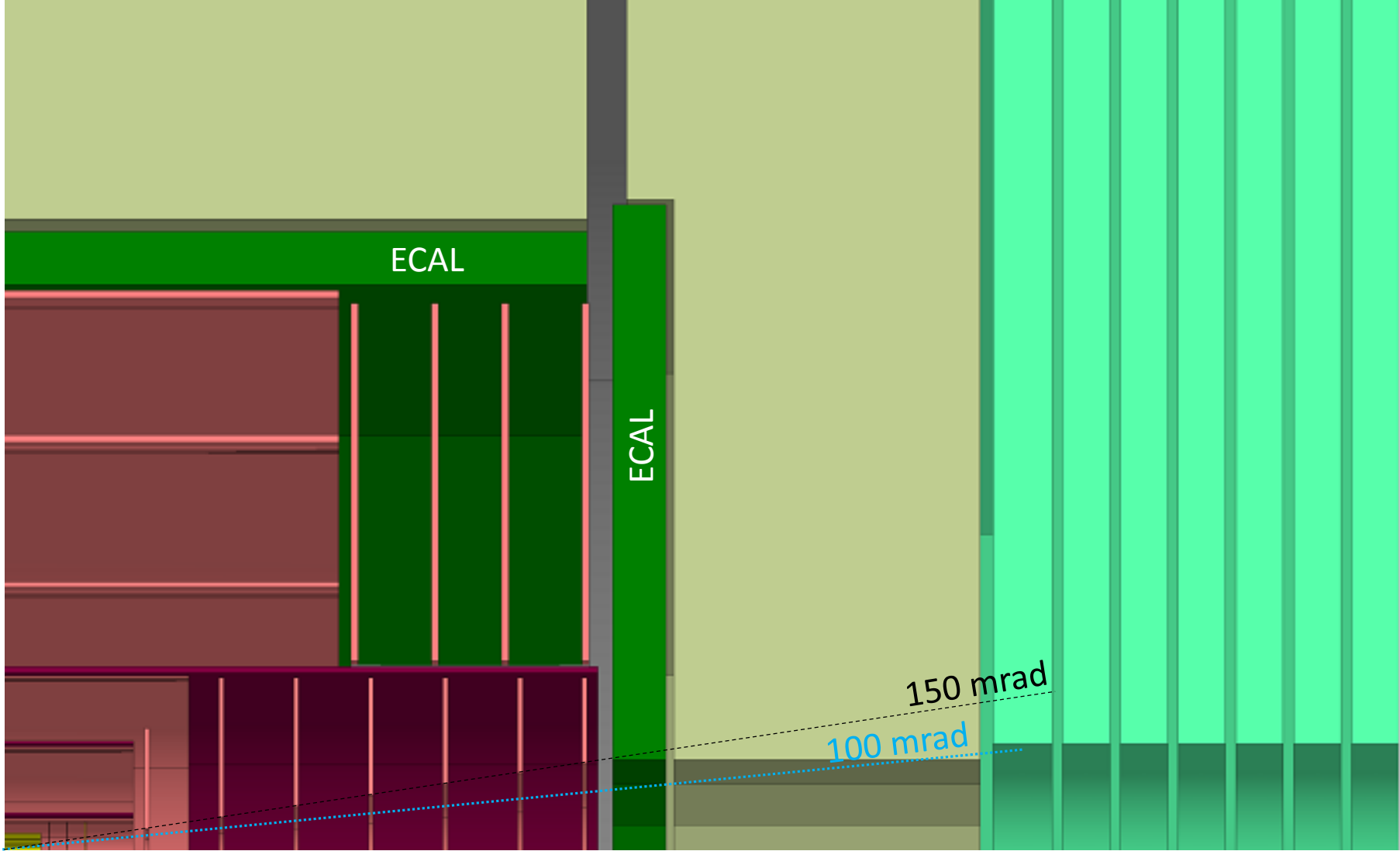


CLD detector

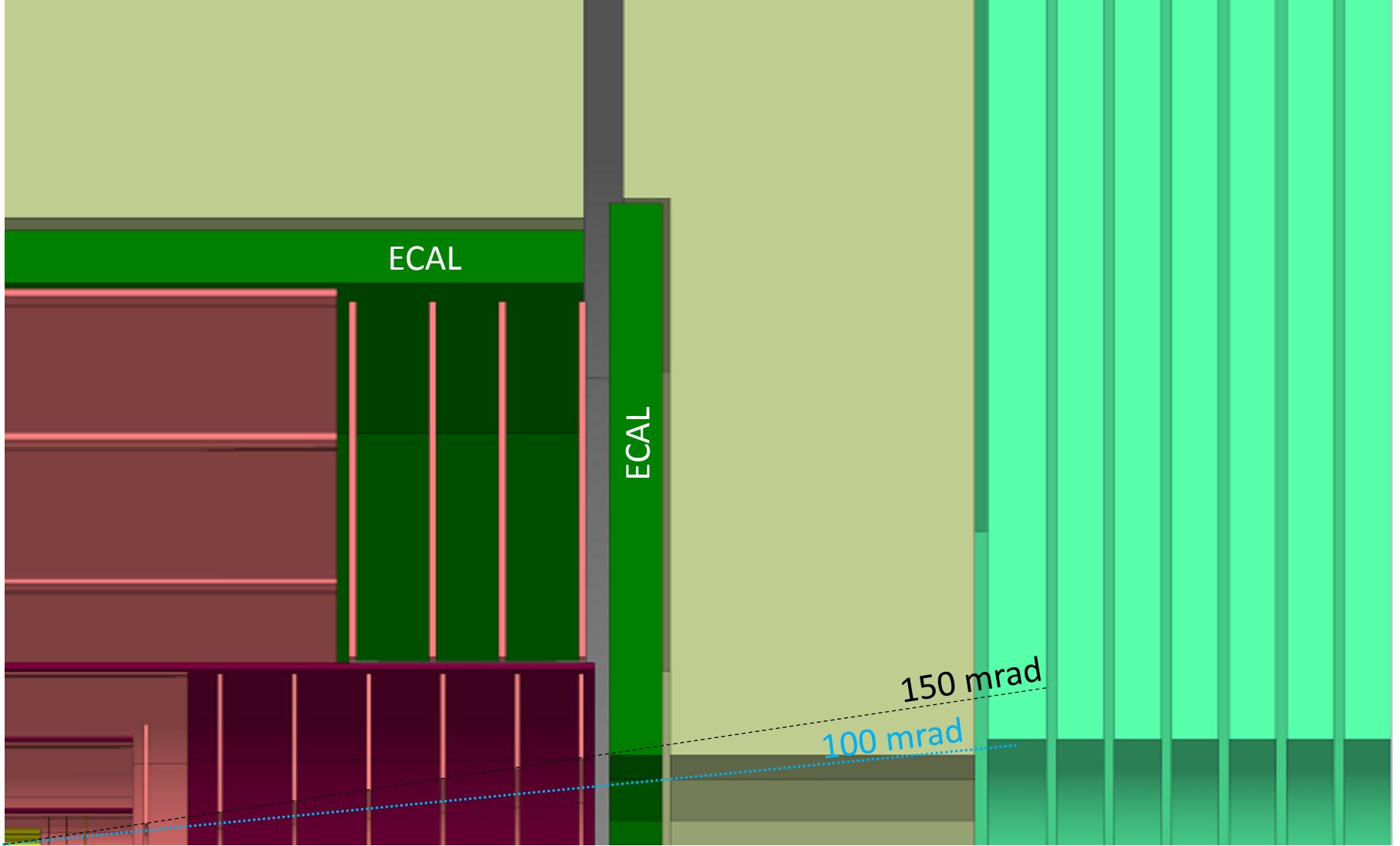
(quarter view)



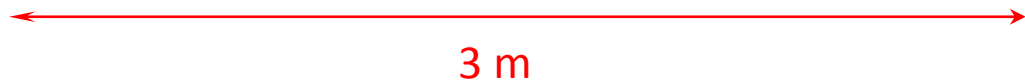


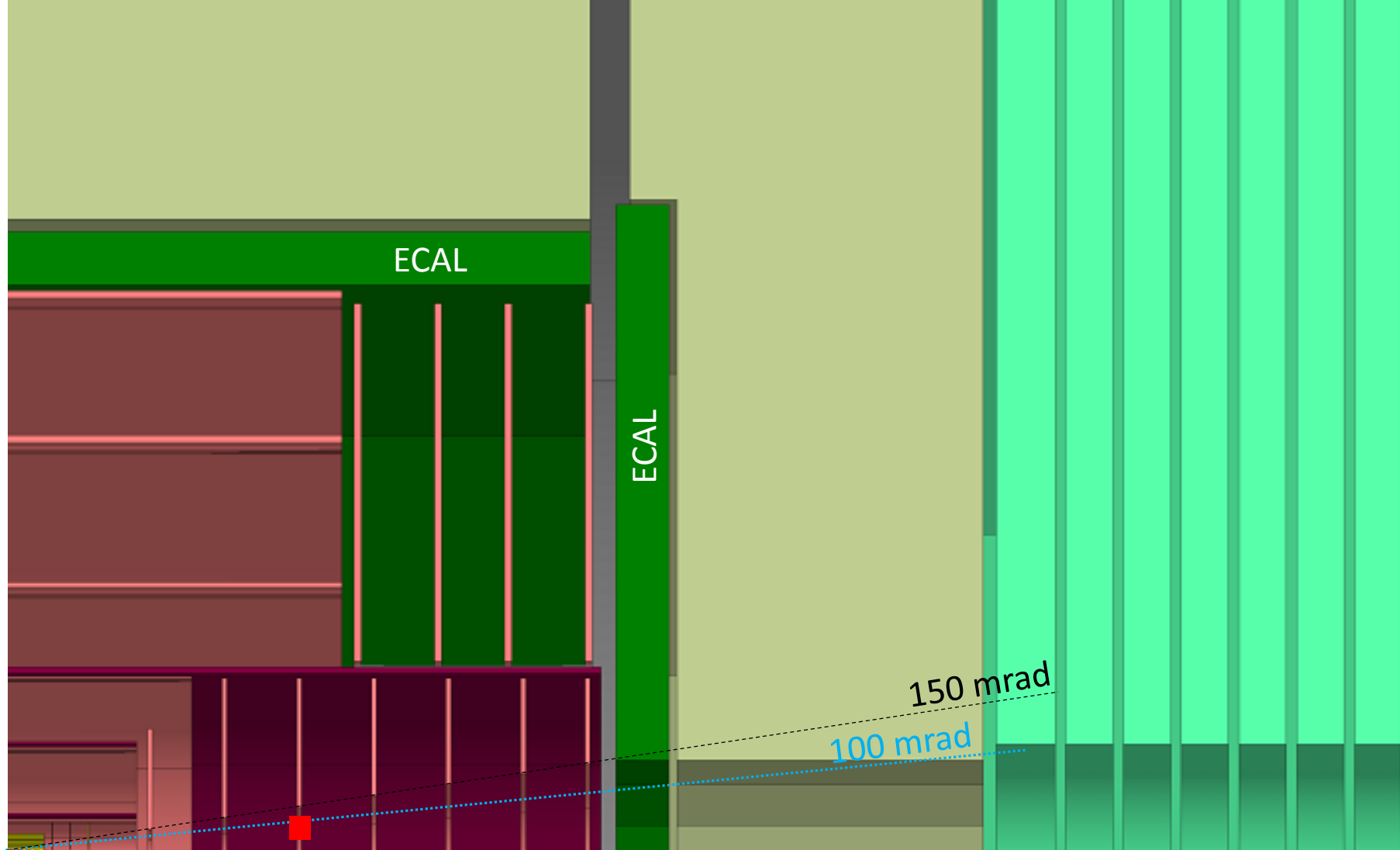


3 m



but where are LumiCal, QC1, etc. ??





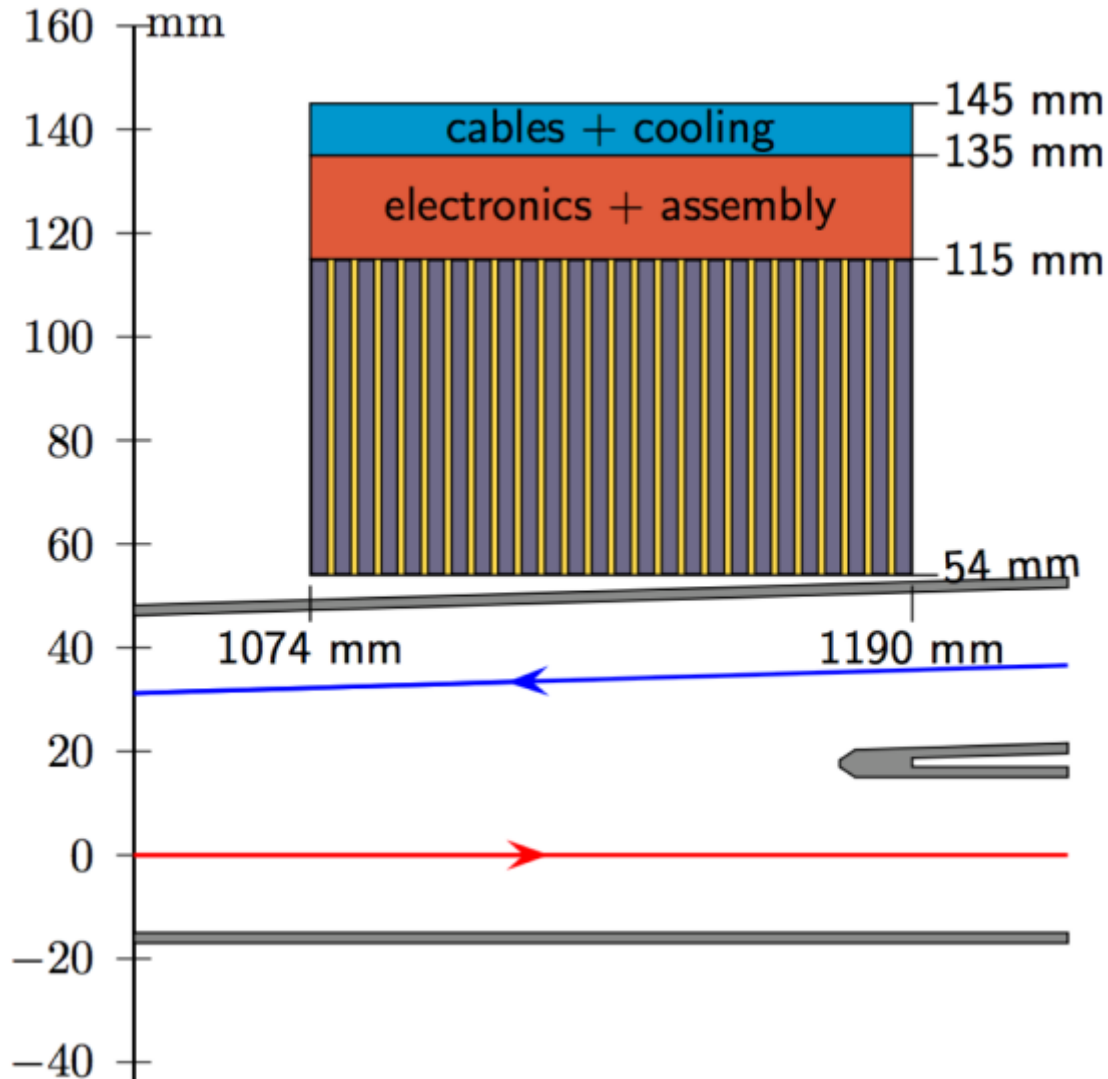
LumiCal

(including services)

1190 mm

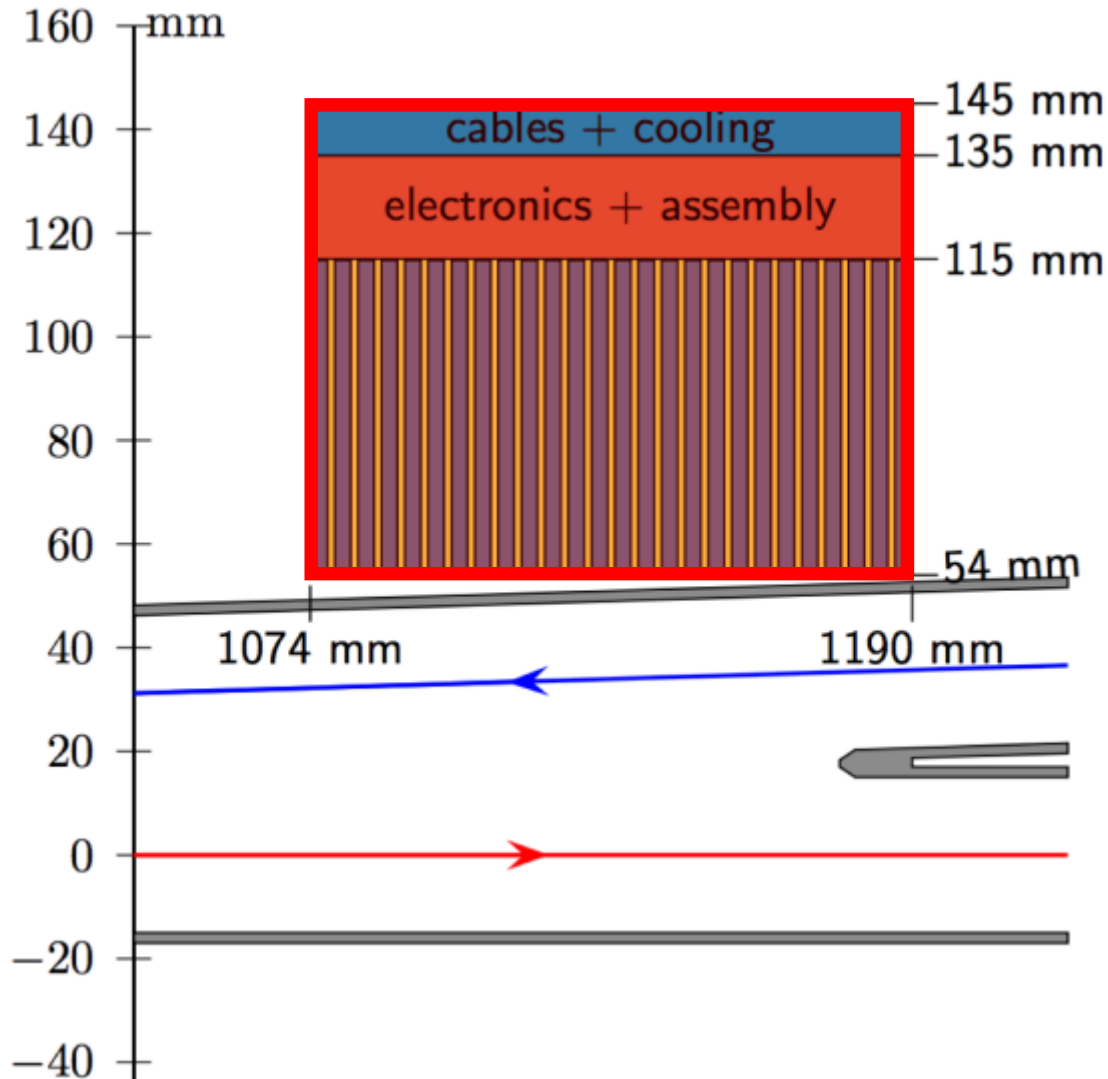
LumiCal Design

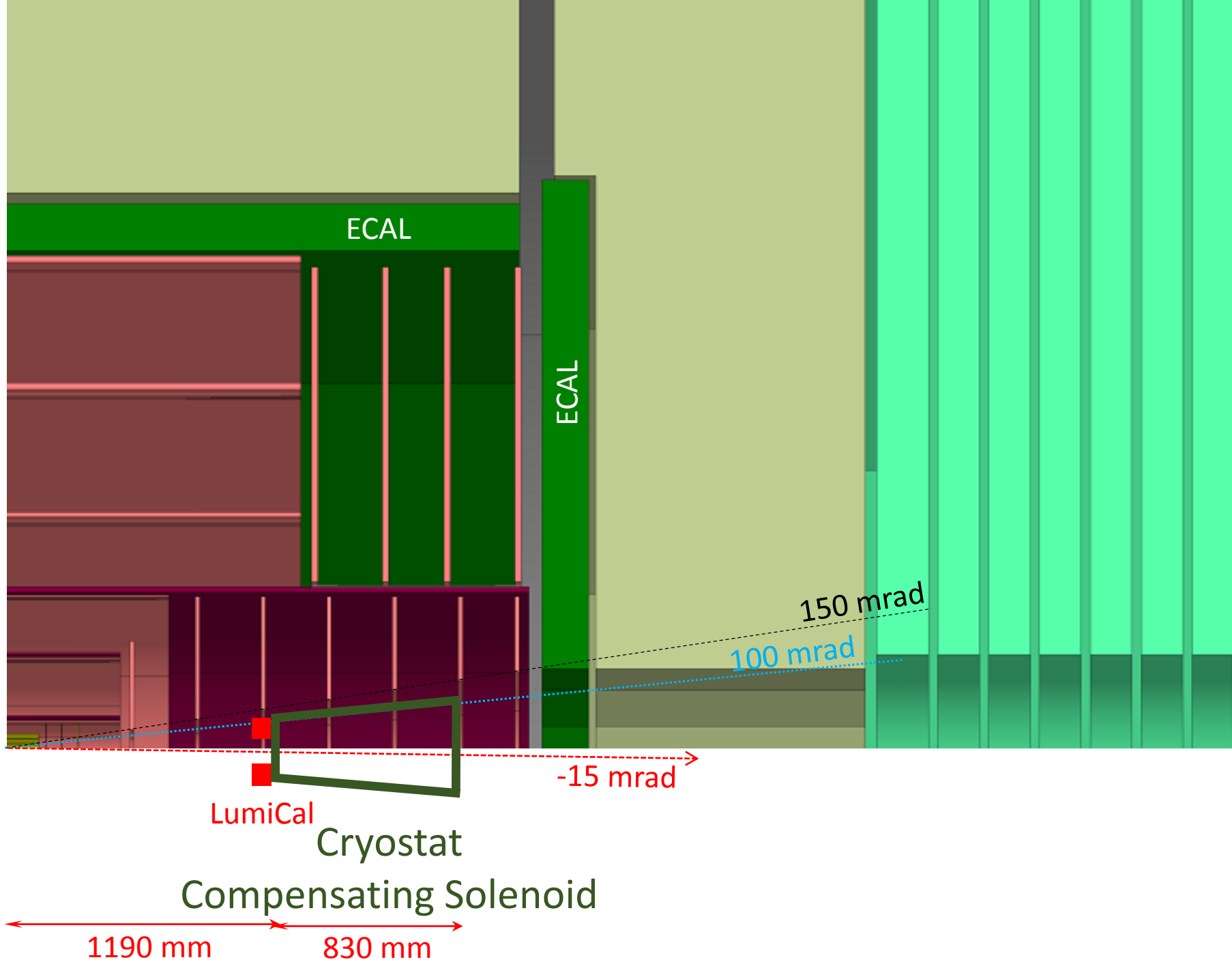
Mogens Dam, FCC week 2018



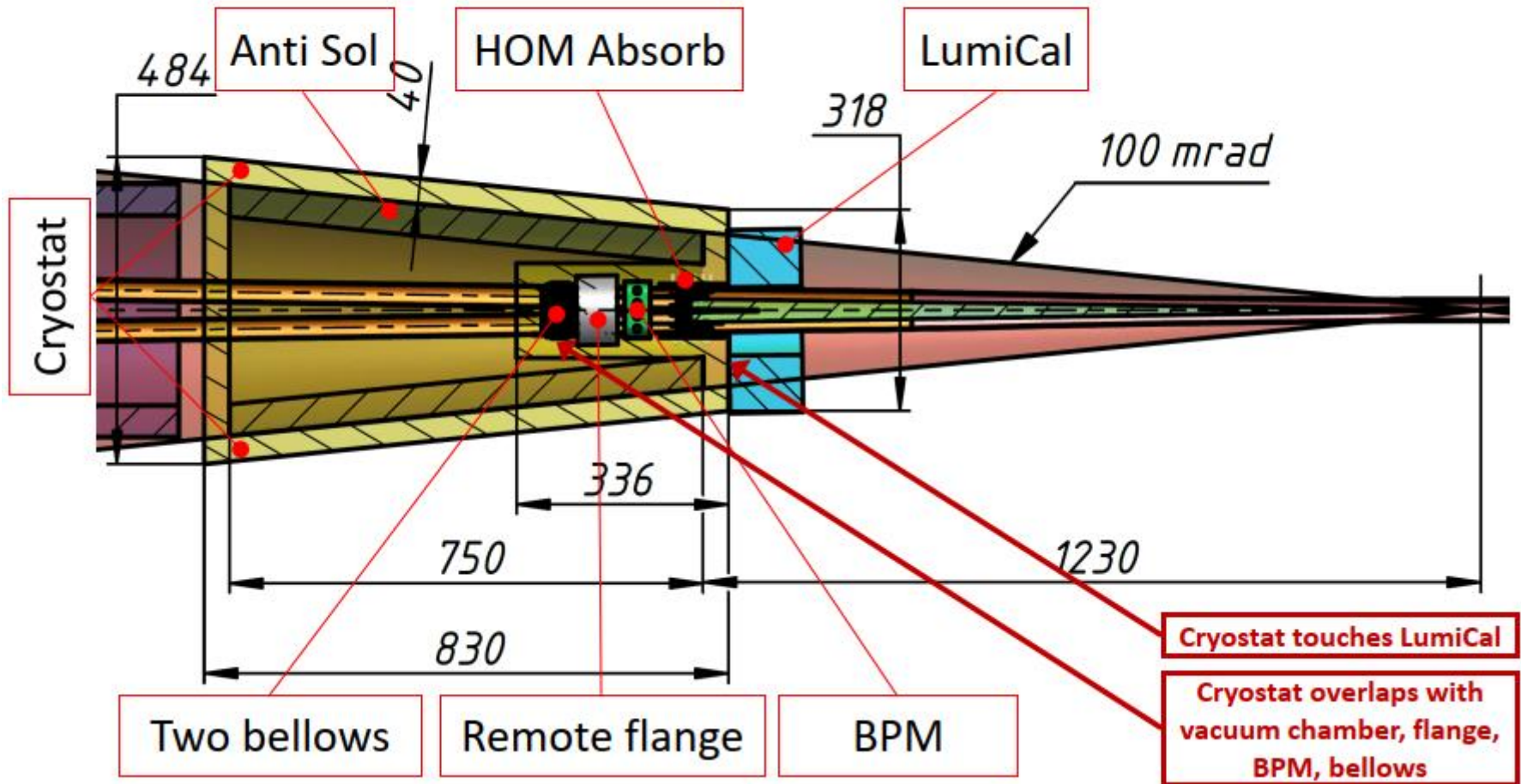
LumiCal Design

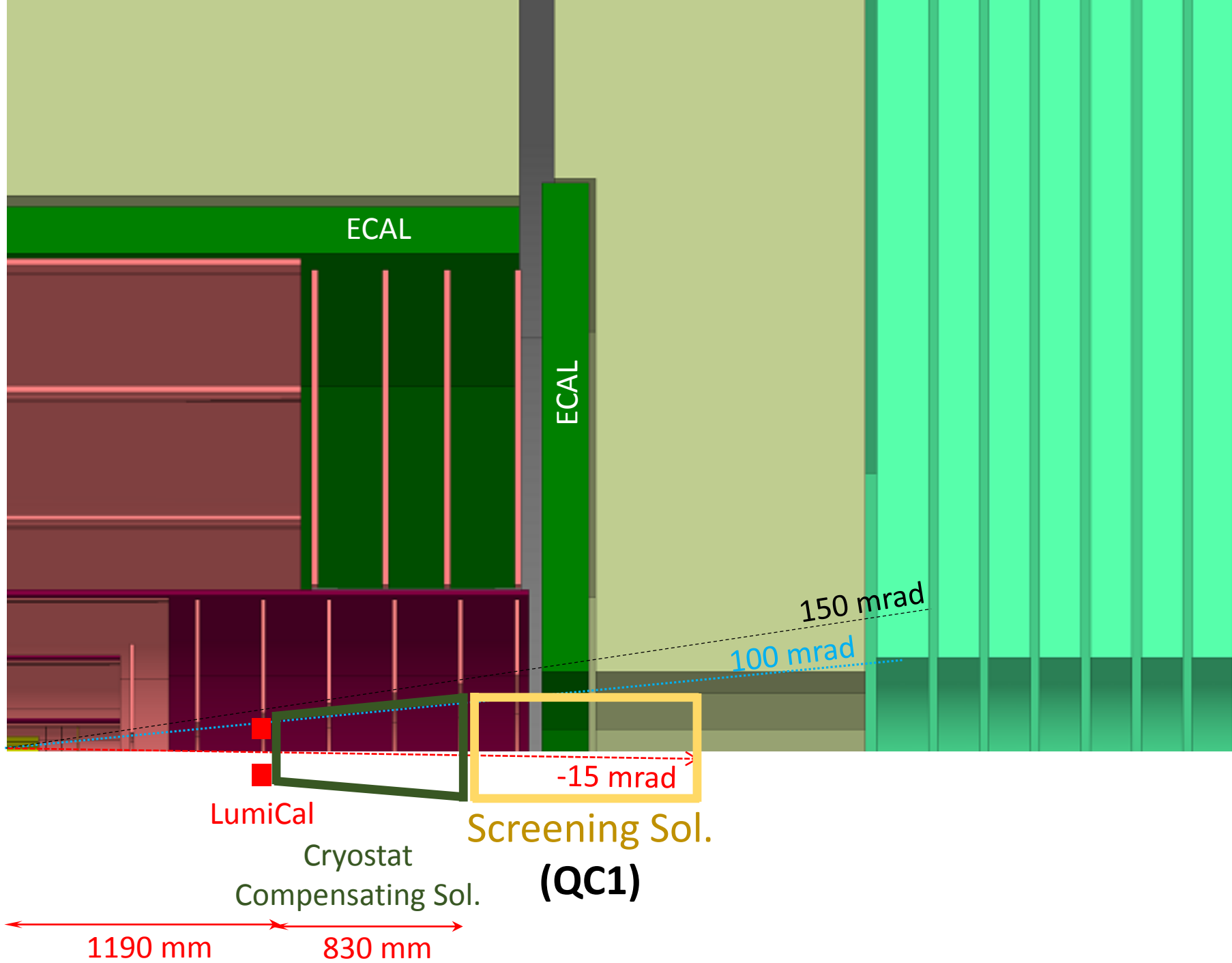
Mogens Dam, FCC week 2018





Attempt to look in detail





CDR sketch of MDI

Mike Koratzinos

Very simple, no details

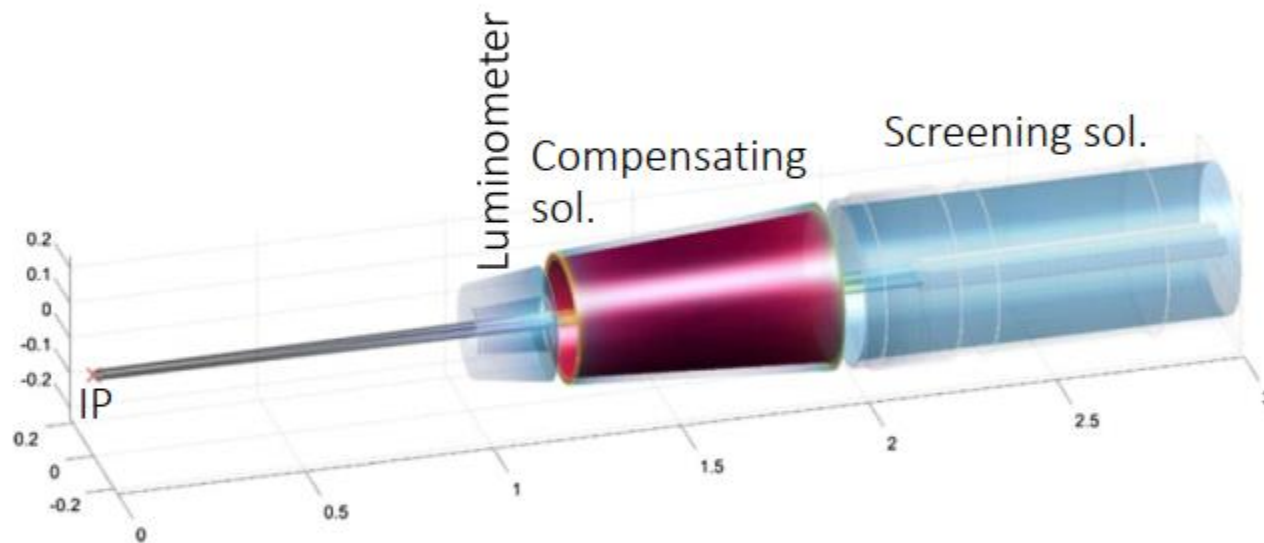
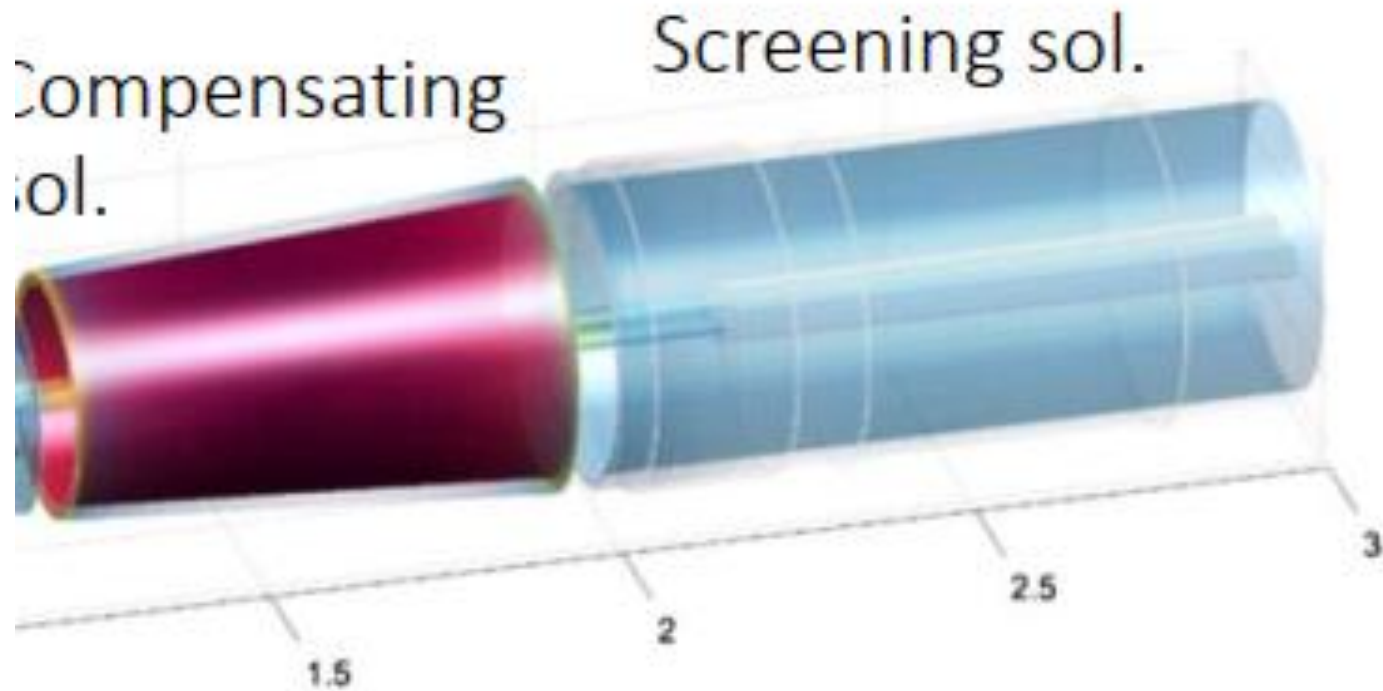


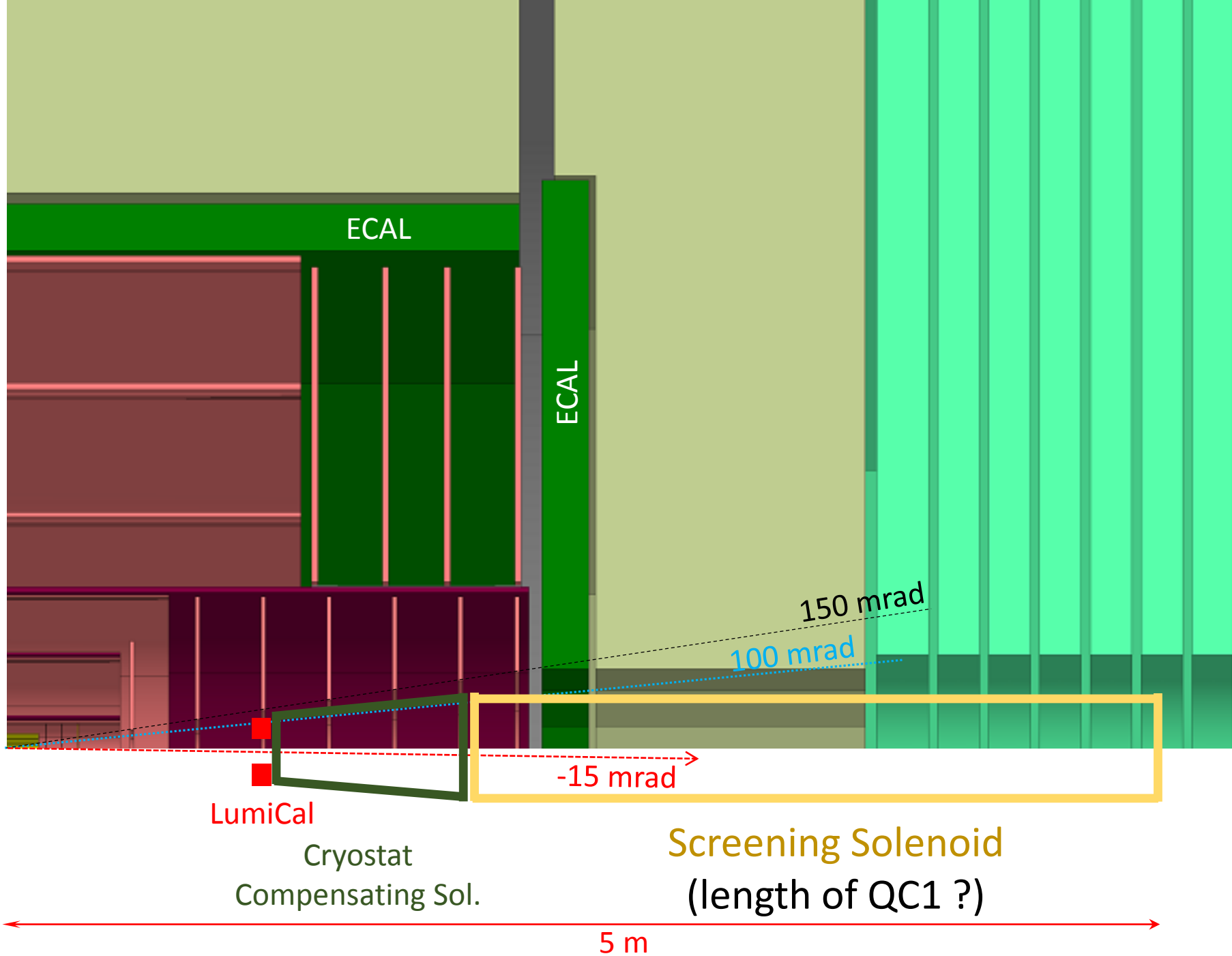
Fig. 2.20. A 3D sketch of the interaction region (IR) magnet system in the first 3 m from the interaction point (IP). Zero in the plot marks the location of the IP).

CDR sketch of MDI

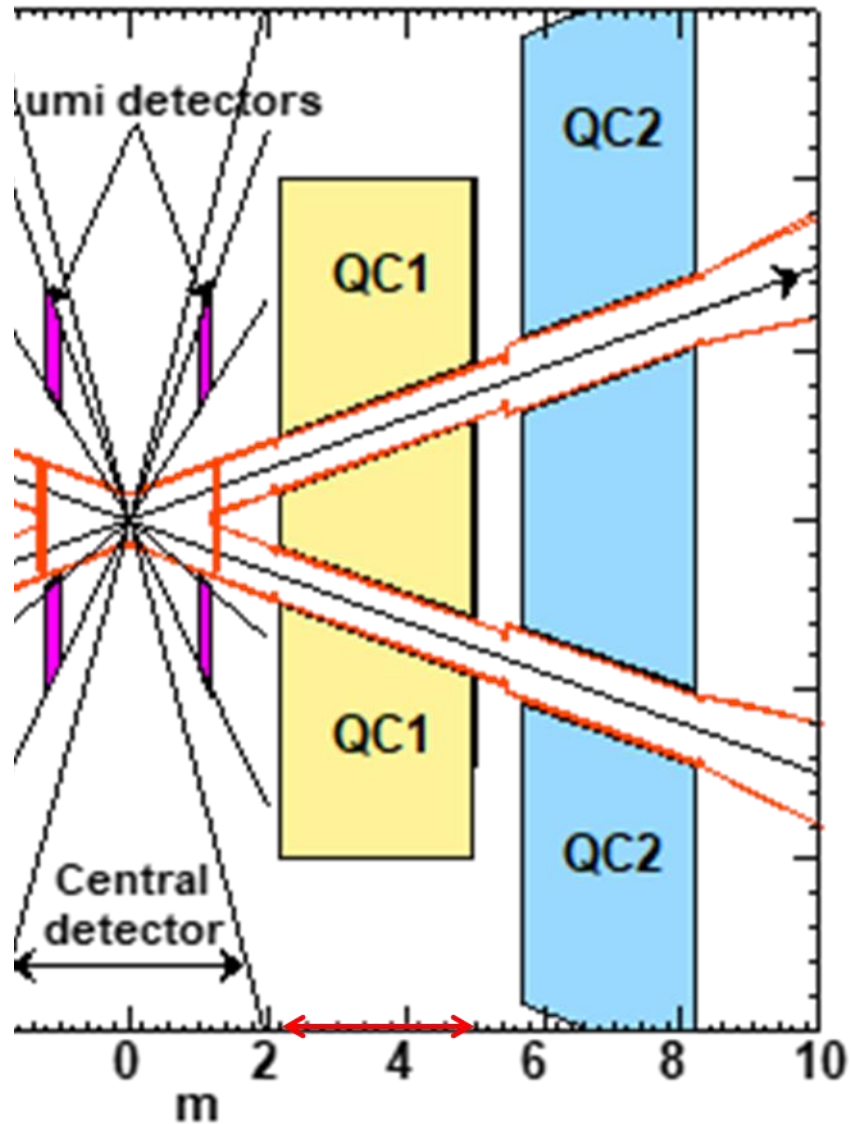
Mike Koratzinos

Very simple, no details





Is this the official overall length of QC1 ?



(N.B. QC2 is outside of the detector)

E.m. calorimetry at CLD - forward angle coverage

ECAL endcap coverage

nominal (“old”)

(use centre of ECAL endcap inner face)

> 142 mrad

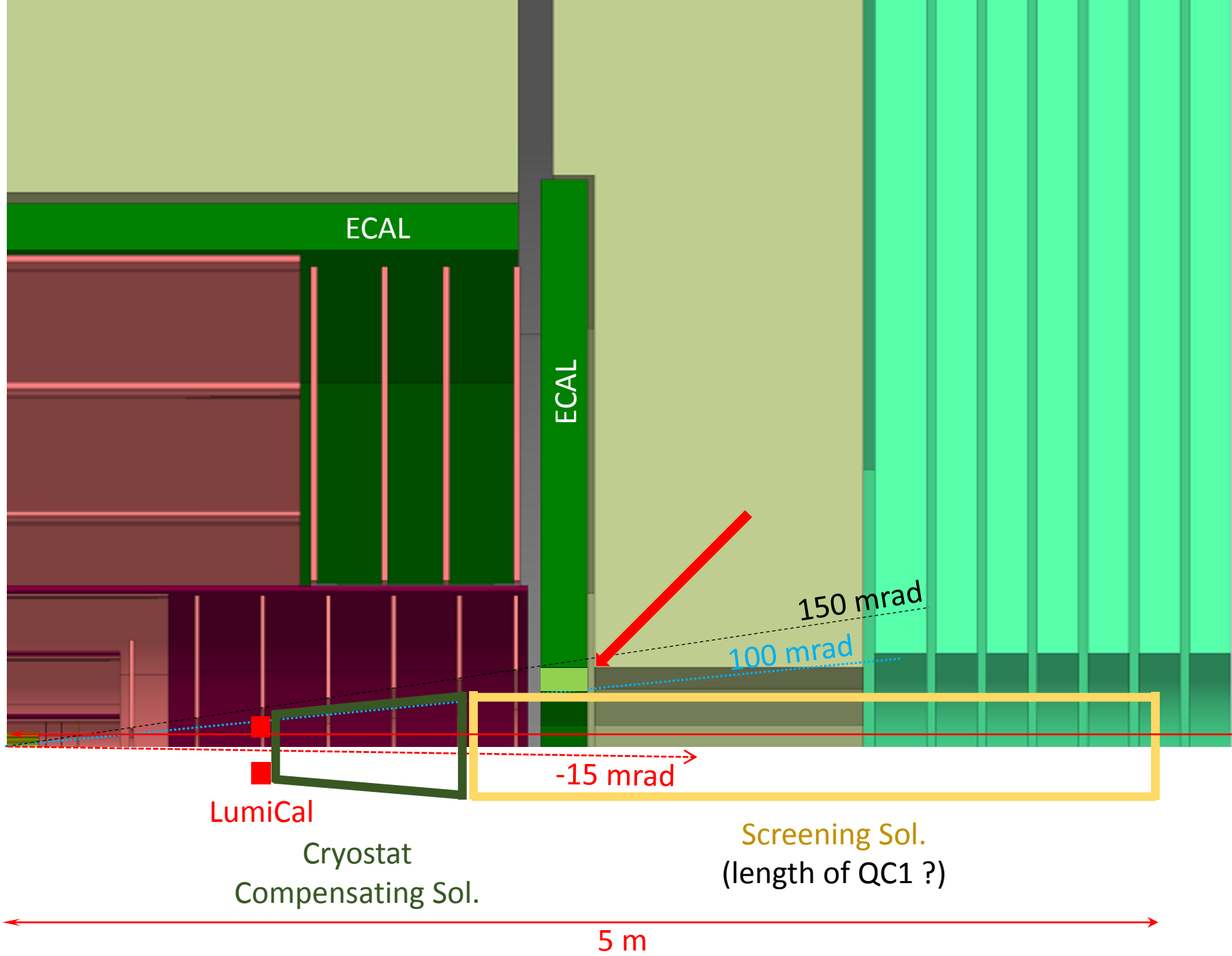
proposal Sept. 2019

> 108 mrad

LumiCal coverage

< 82 mrad

(w.r.t CLD detector axis)

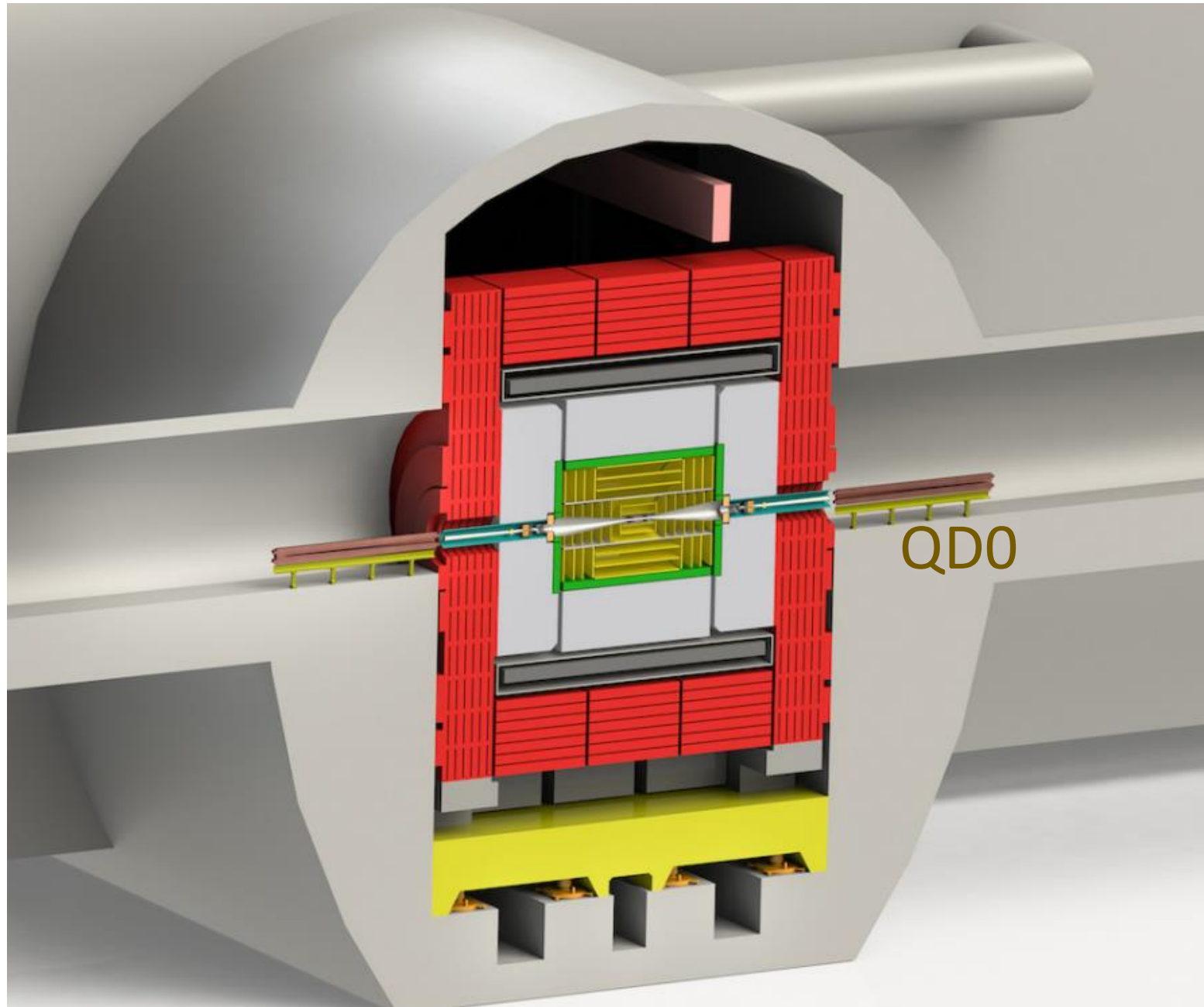


BIG QUESTION:

Opening and closing the detector
(construction / maintenance)

(here some information from CLIC)

Parenthesis: the situation at CLIC (summary report 2018)

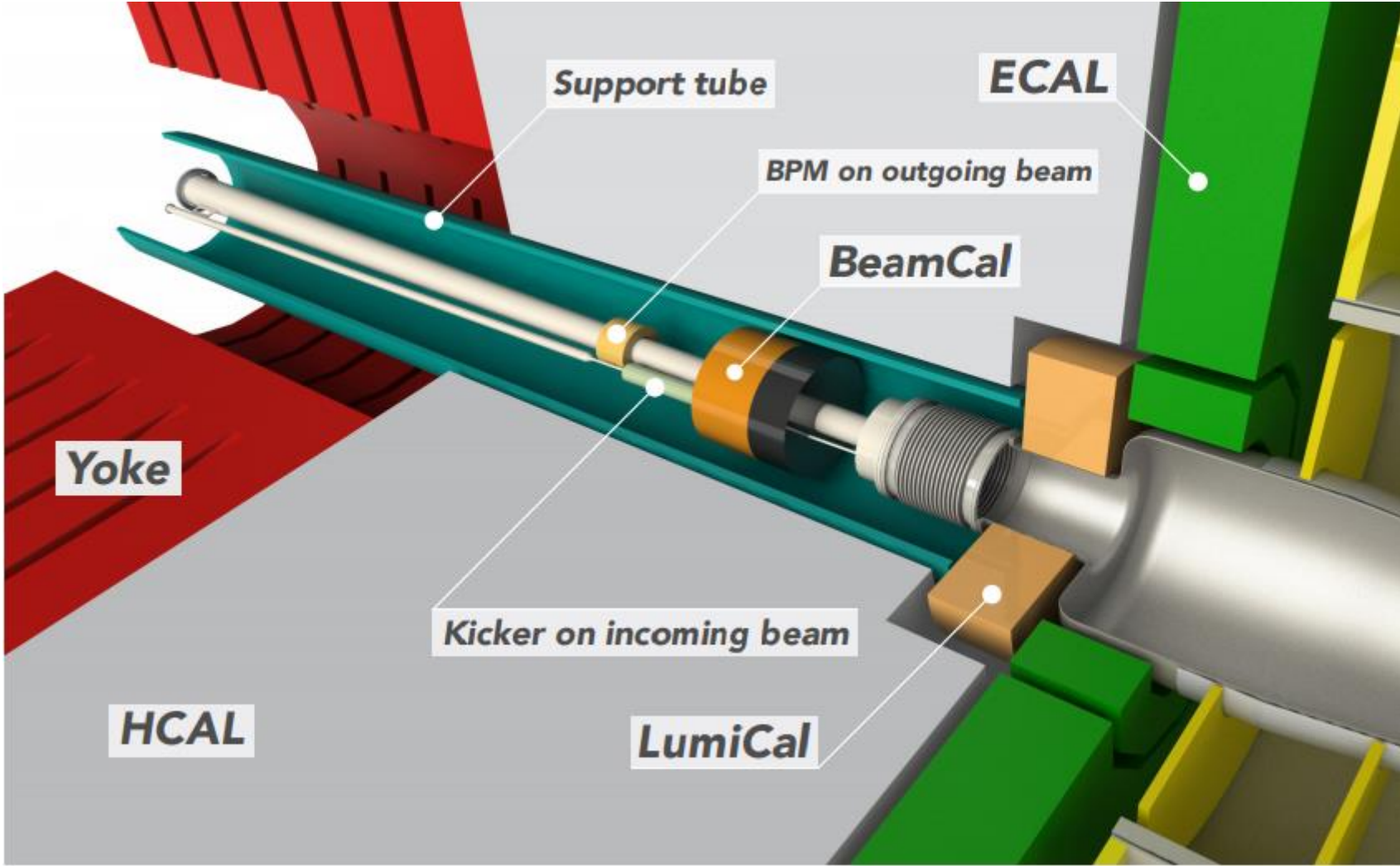


11 Detector Opening and Maintenance

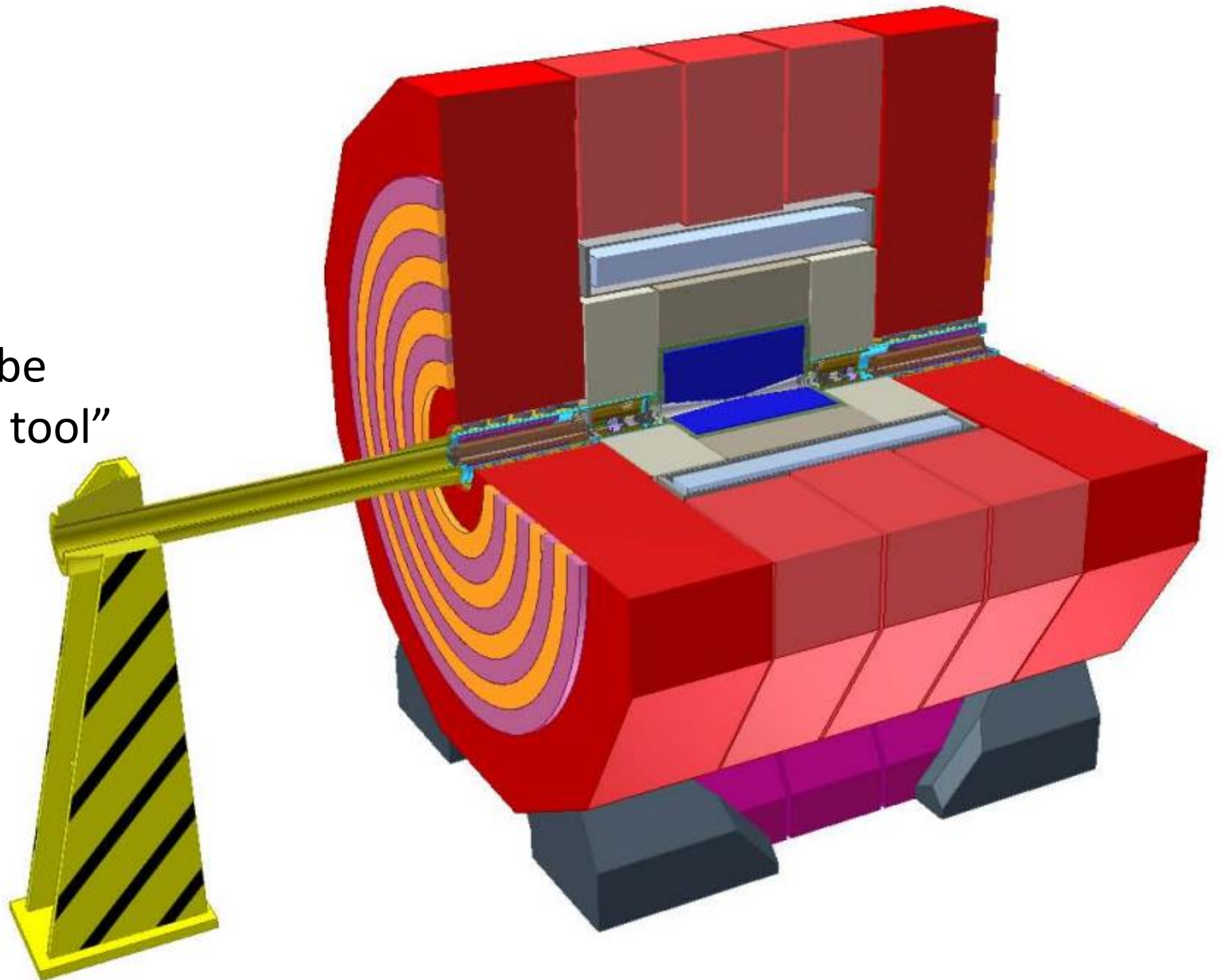
The preliminary procedure for detector opening and maintenance, as outlined in the CDR, can be applied to CLICdet with minor changes. The main steps are:

- close all beam pipe vacuum valves, vent the beam pipe in the detector region with a dry gas (e.g. nitrogen);
- open the vacuum on the detector-side of QD0, close the detector vacuum system by flanges;
- move the detector from the IP to the garage position in the cavern;
- the support tube installation/extraction tool is installed behind the endcap;
- the jacks holding the support tube in position are retracted;
- the endcap is slid back, giving access to the vacuum connection between forward region and central detector;
- open vacuum connection near LumiCal, remove bellows as shown in Figure 33;
- LumiCal is opened sideways, and the support tube can be retracted some 50 cm by the extraction tool;
- close the vacuum system on all sides by flanges;
- remove the support tube as a whole by a crane;

Parenthesis: the situation at CLIC (summary report 2018)



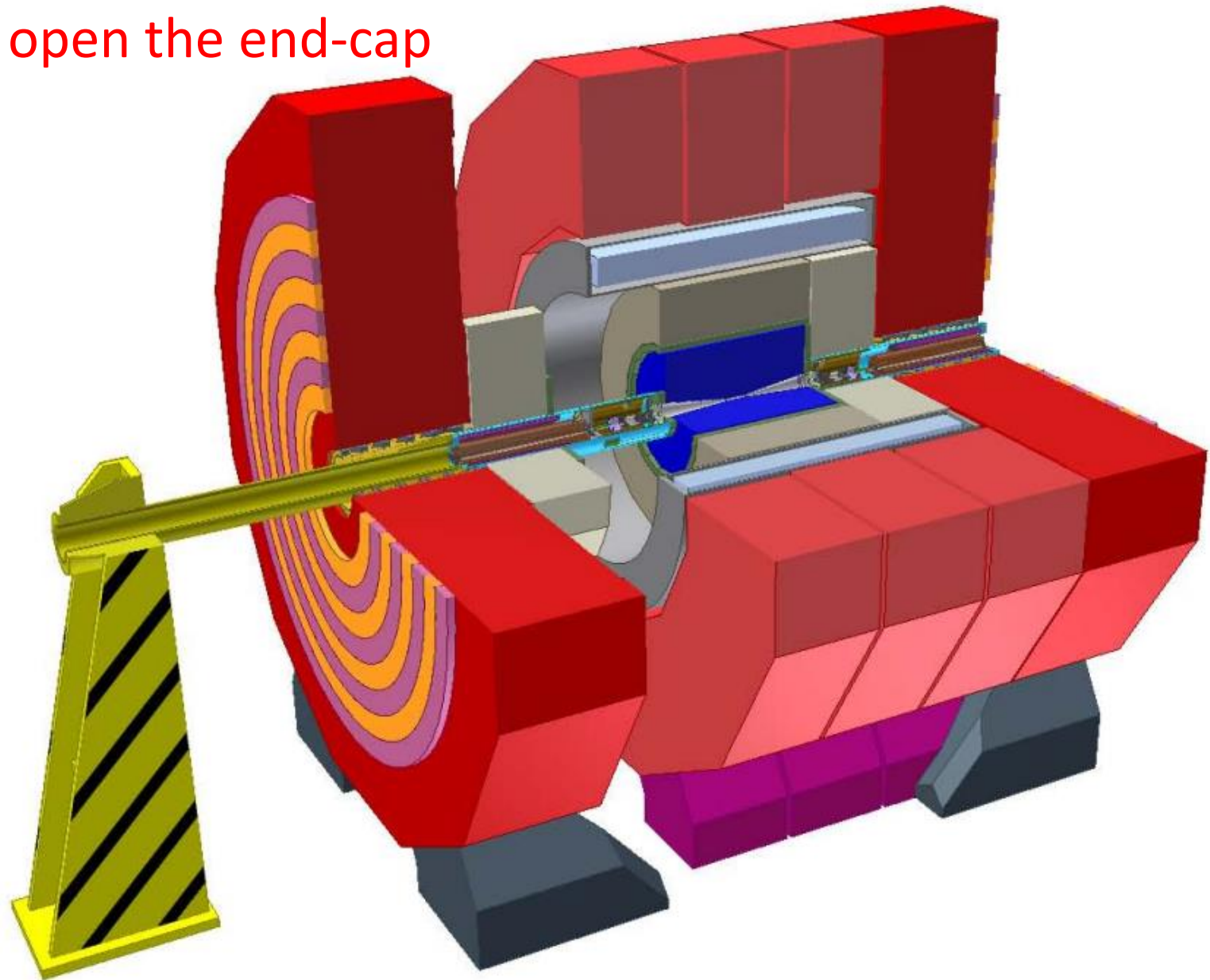
Parenthesis: the situation at CLIC (CDR 2012 – “somewhat outdated”)



Support-tube
“extraction tool”

Parenthesis: the situation at CLIC (CDR 2012 – “somewhat outdated”)

open the end-cap



Parenthesis: the situation at CLIC (CDR 2012 – “somewhat outdated”)

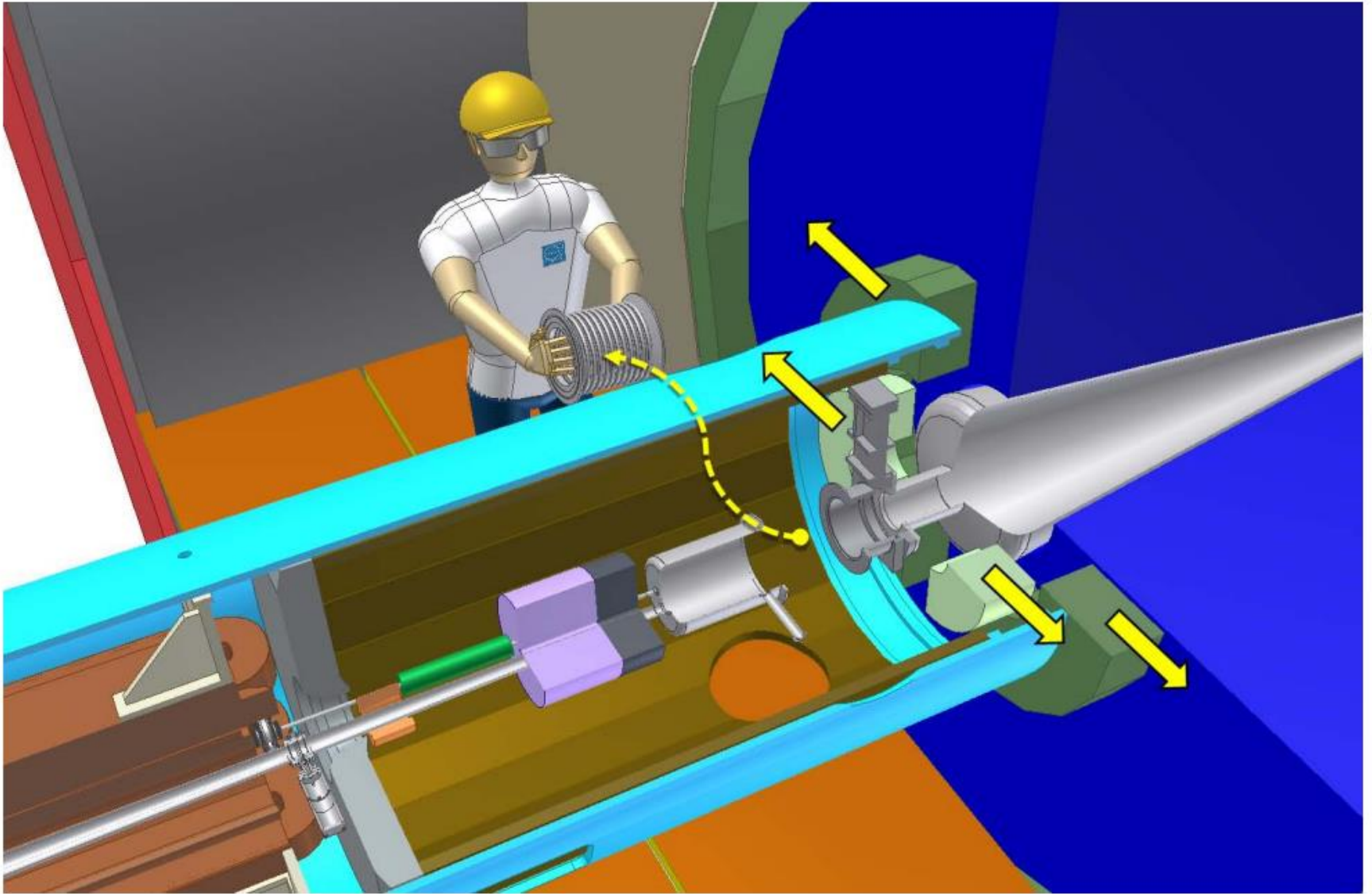


Fig. 11.21: Opening LumiCal and ECAL plug for the passage of the valve.

Parenthesis: the situation at CLIC (CDR 2012 – “somewhat outdated”)

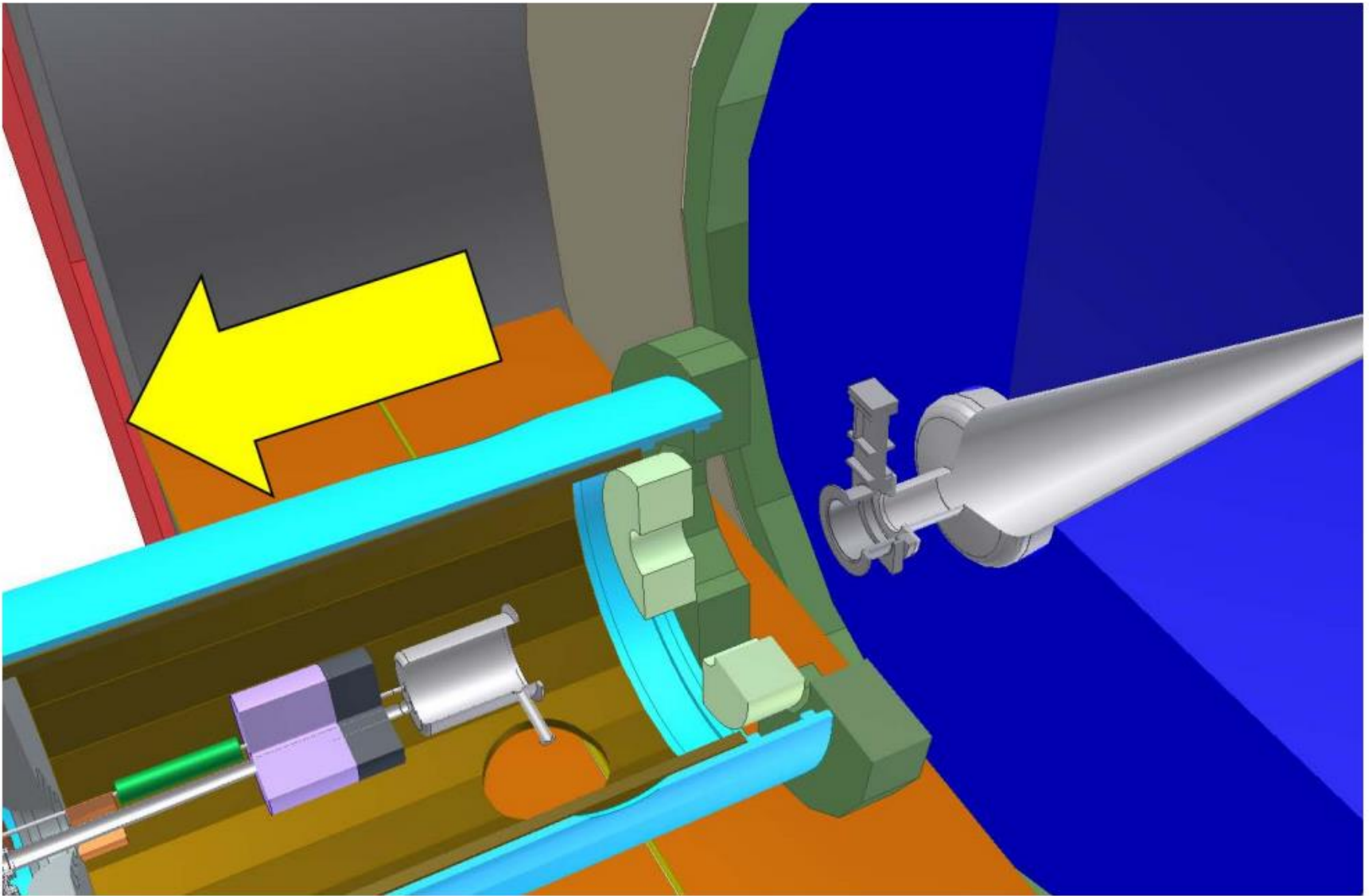


Fig. 11.22: Retraction of the support tube.

Parenthesis: the situation at CLIC (CDR 2012 – “somewhat outdated”)

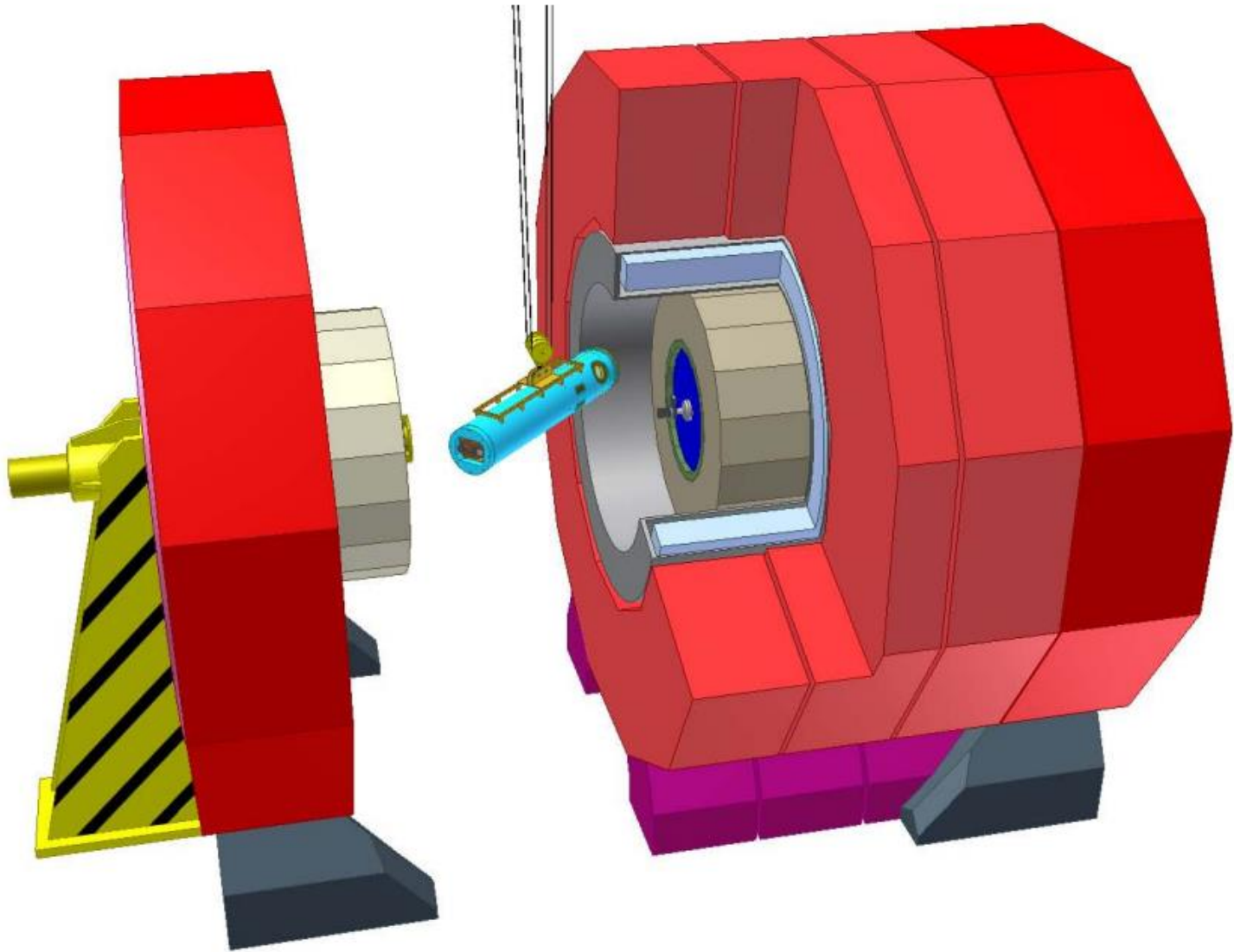
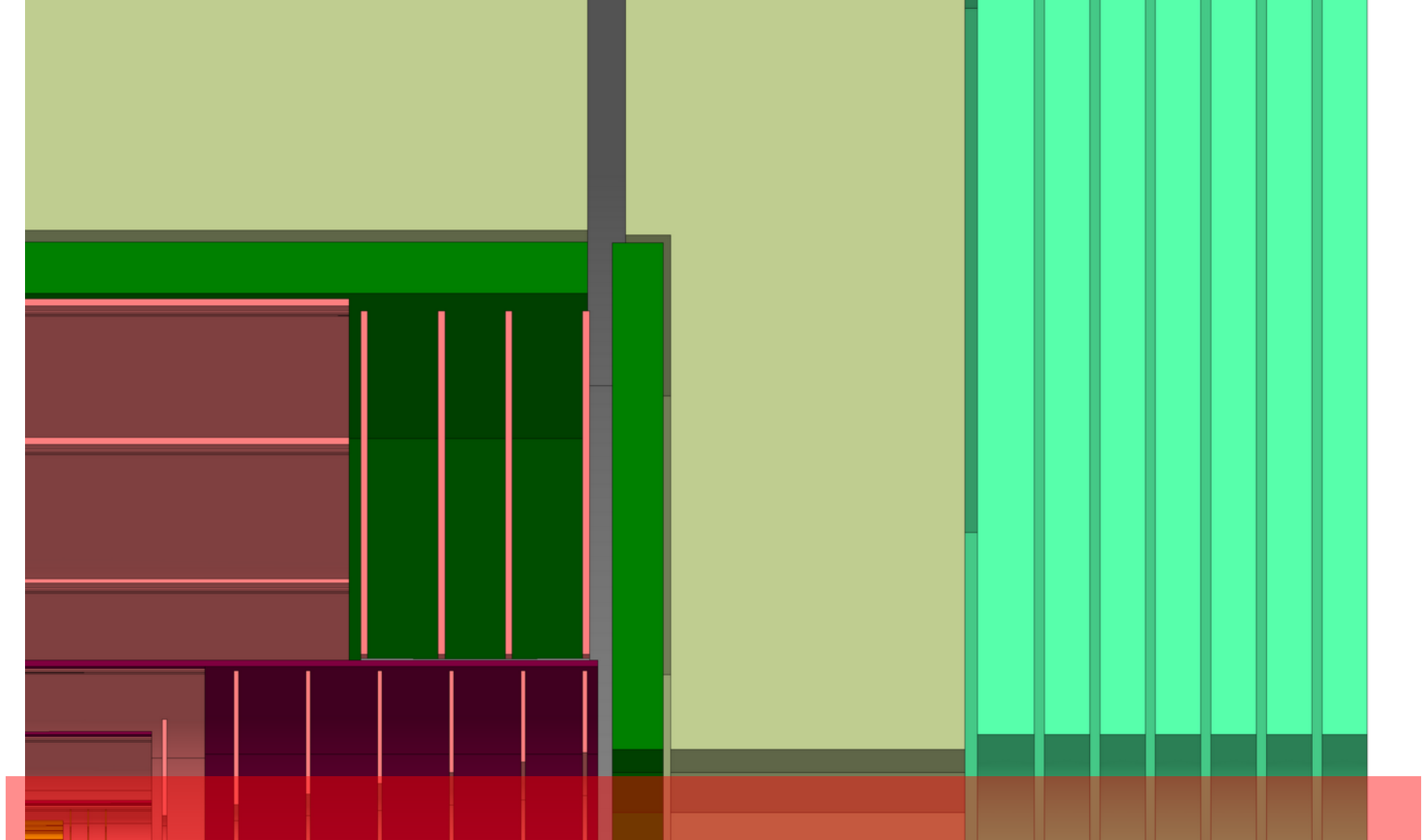


Fig. 11.23: Final removal of the support tube by crane.

NB. For access to the tracker + vertex
both end-caps need to be opened!

can something like this work for CLD?

Alternative proposal by Novosibirsk ->



Proposal by BINP: install “everything” (both sides) of MDI + vertex on one girder,
diameter needed: 500 mm

-> completely pushed through from one side !

FEASIBLE ?? IMPOSSIBLE ?? -- complete re-design of inner tracker+ VTX needed

As usual:

more questions than answers...

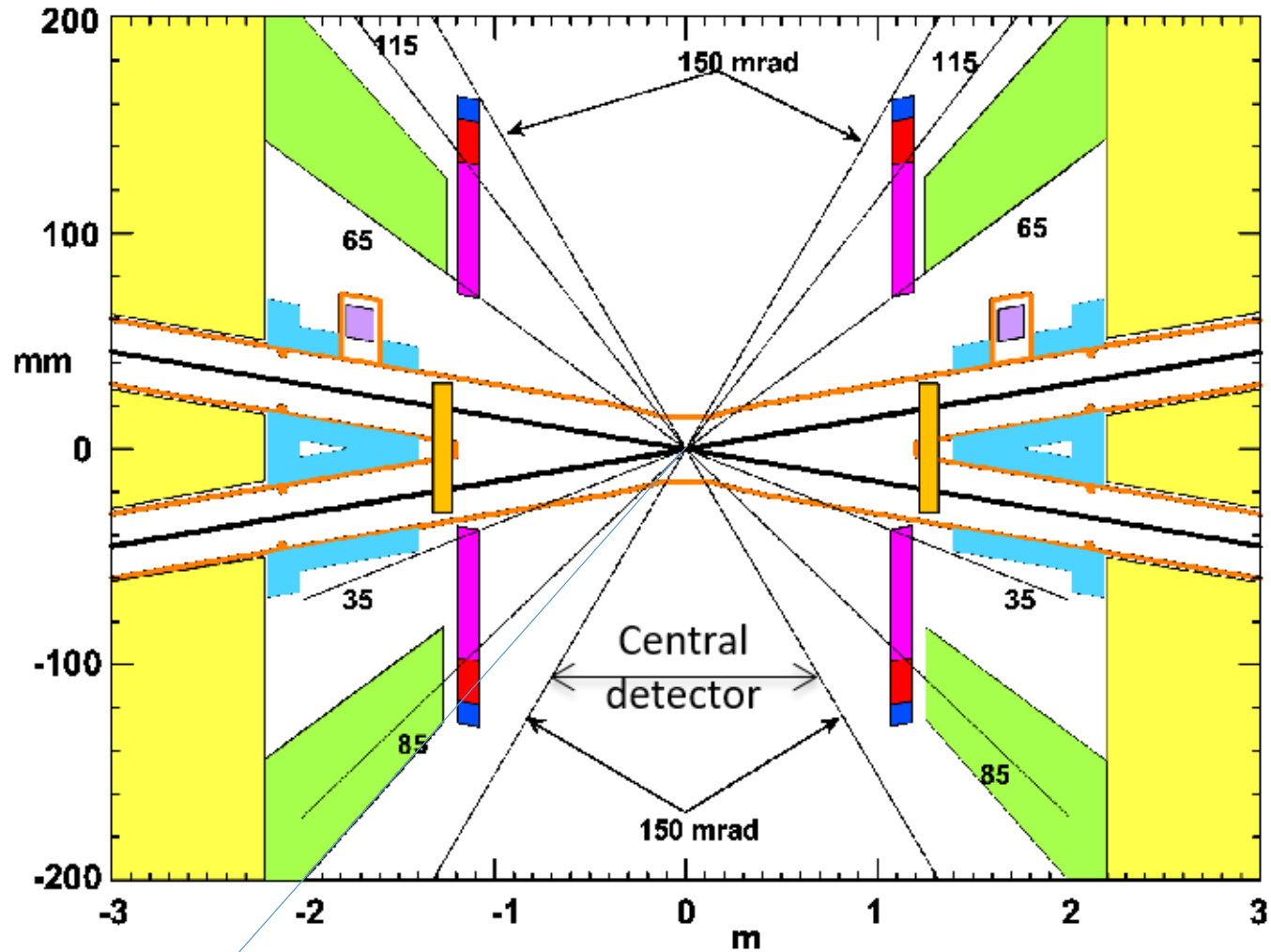
but THANK YOU anyway, for your attention

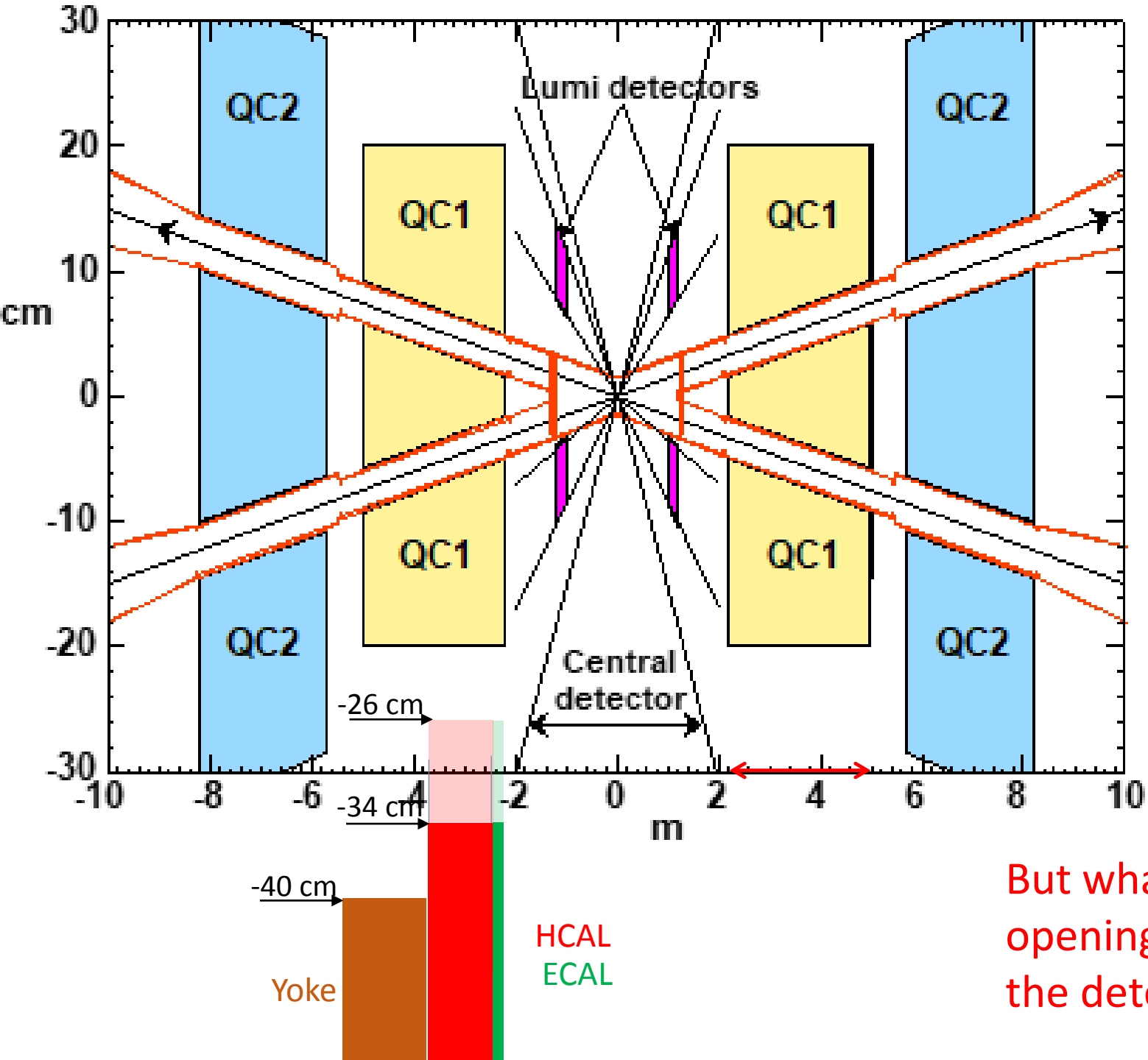
SMARTTEAM code for CLD CATIA drawings: ST0874948

(THANKS to Nicolas Siegrist – CMS)

Thanks to Emilia, Sasha, Yorgos, etc. for their many contributions!

backup slides





But what about opening/closing the detector?

Parenthesis: the situation at CLIC (CLICdp-Note-2017-001)

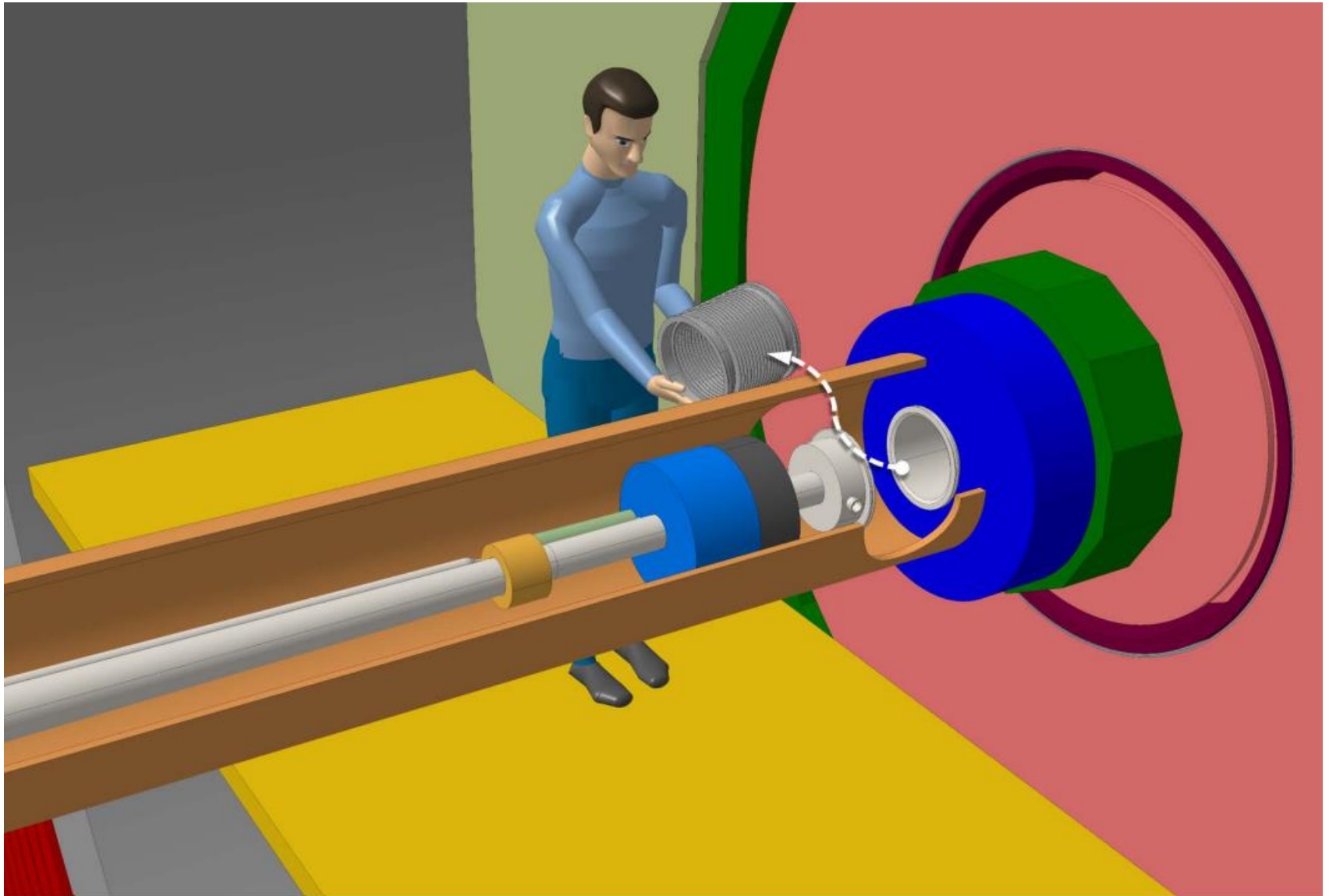
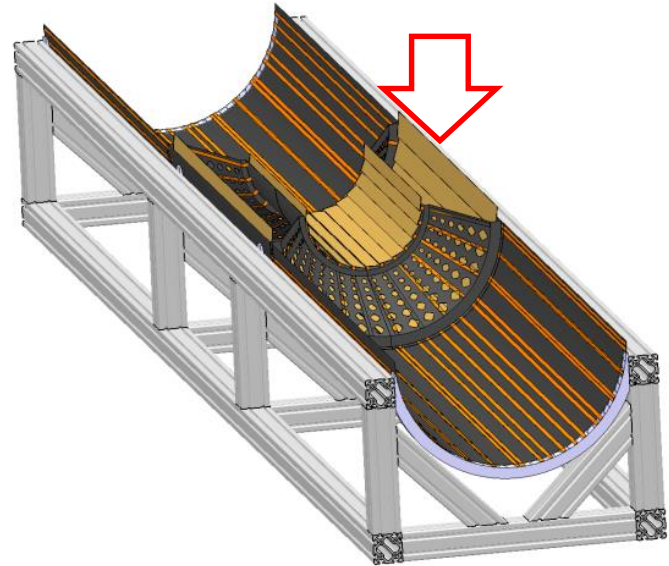
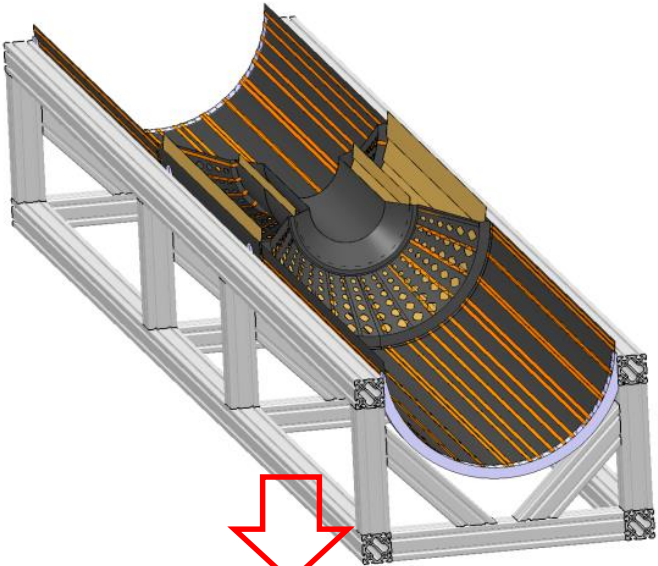
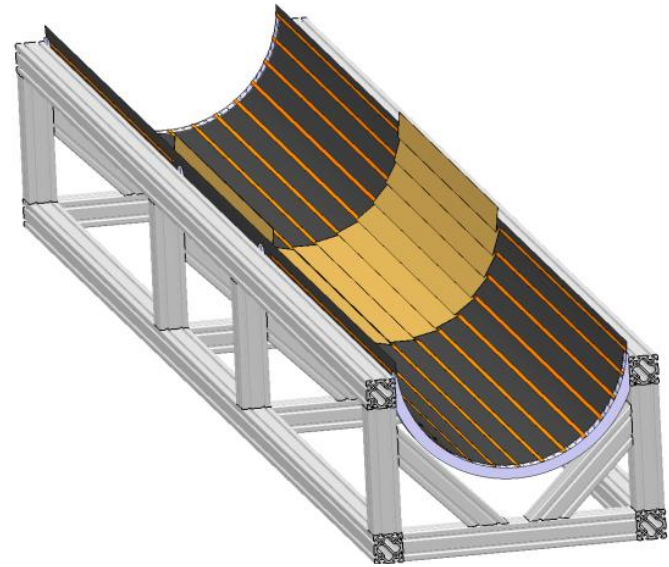
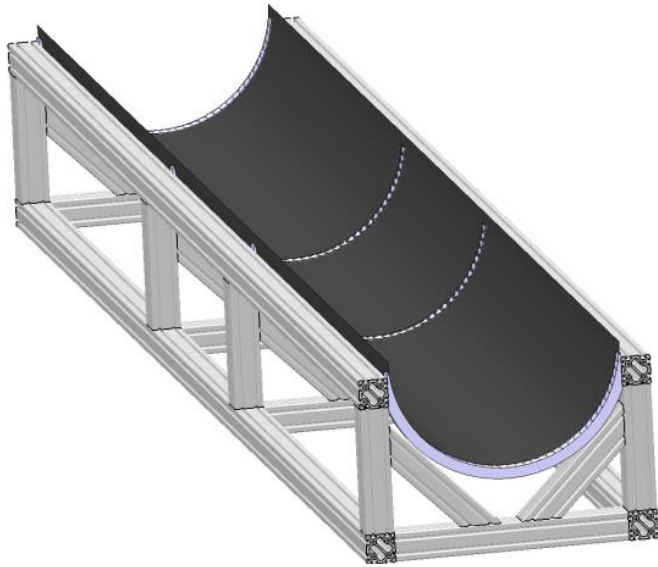
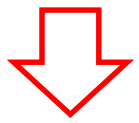


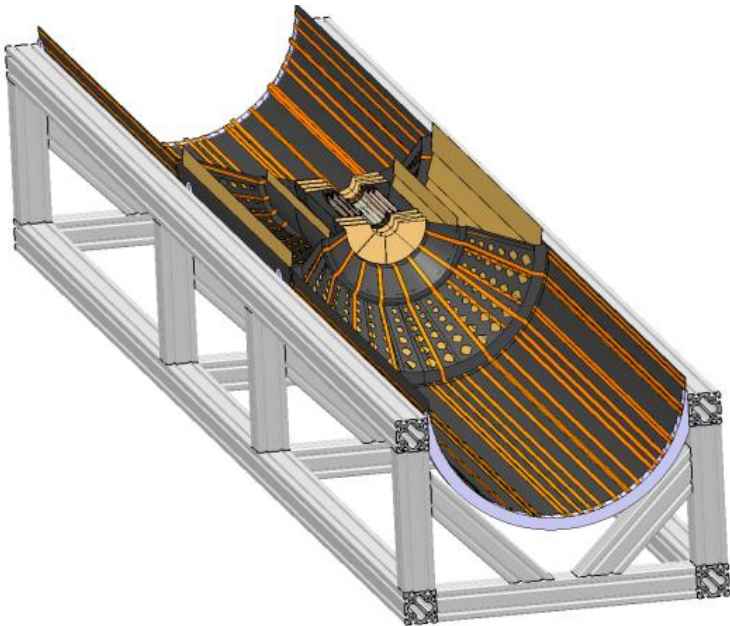
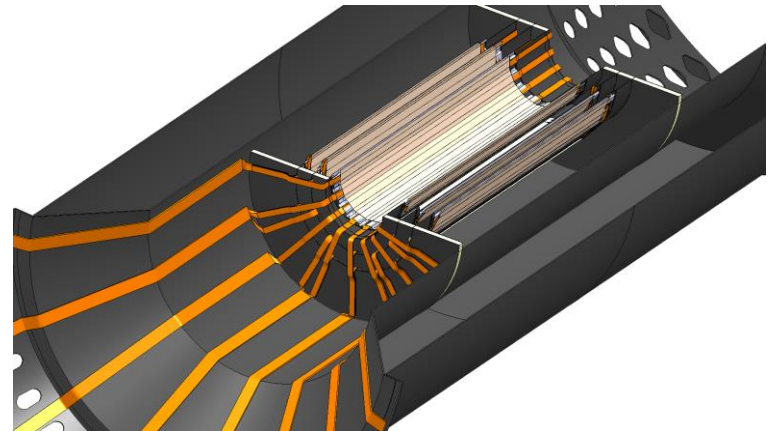
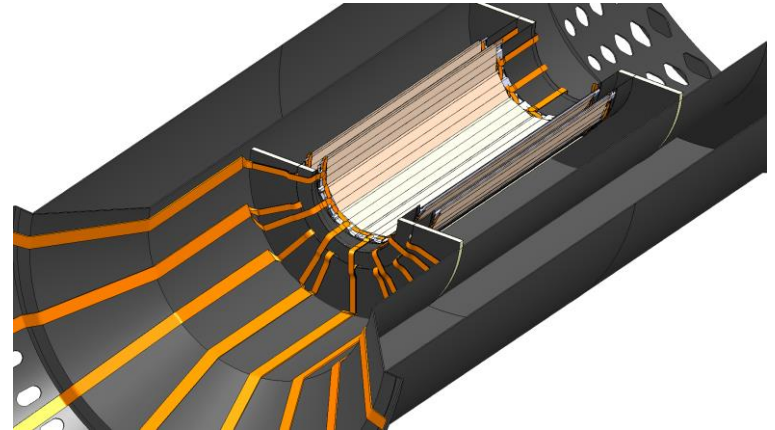
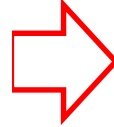
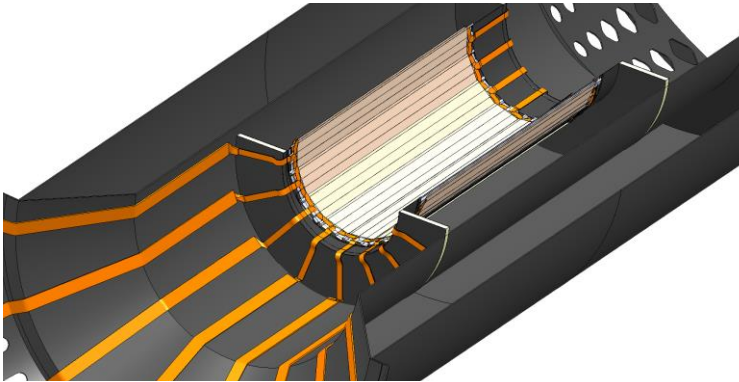
Figure 33: Removal of the bellows downstream of LumiCal.

Sub-assembly #1

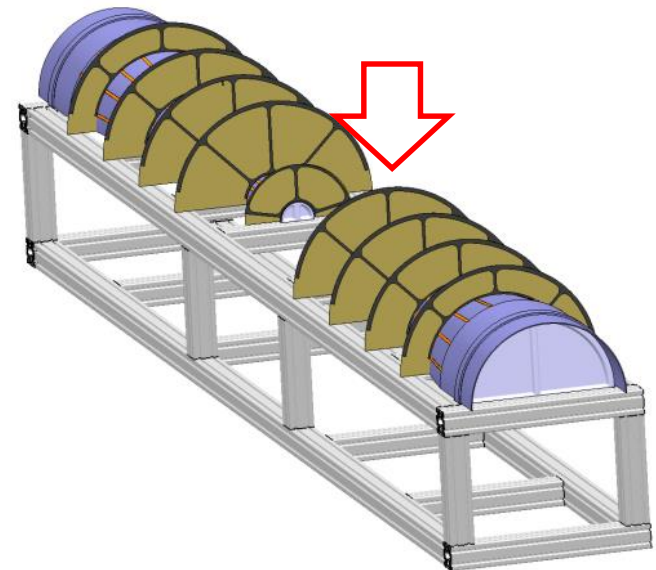
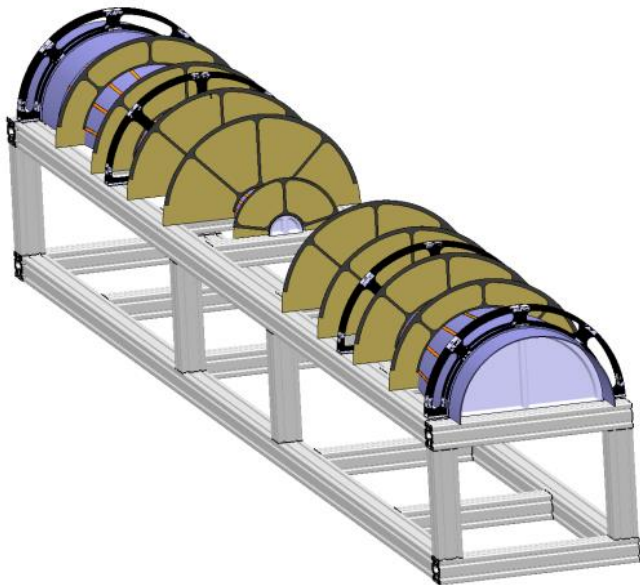
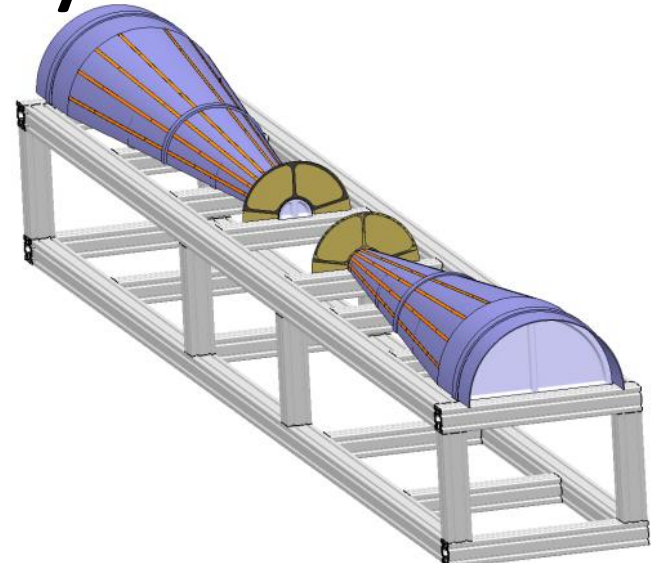
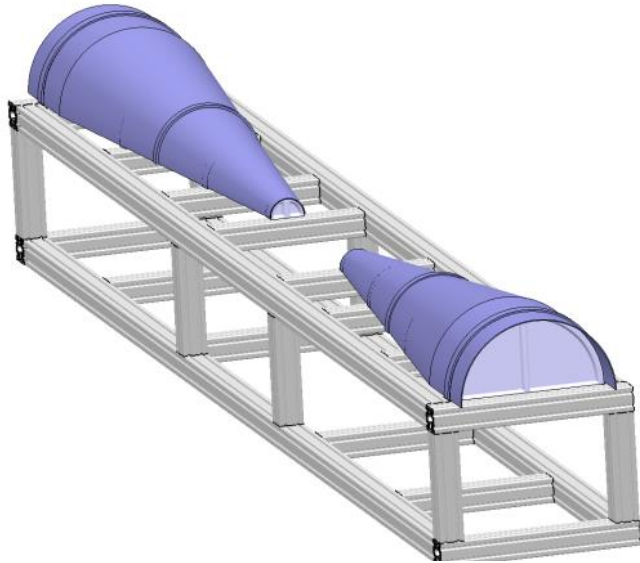




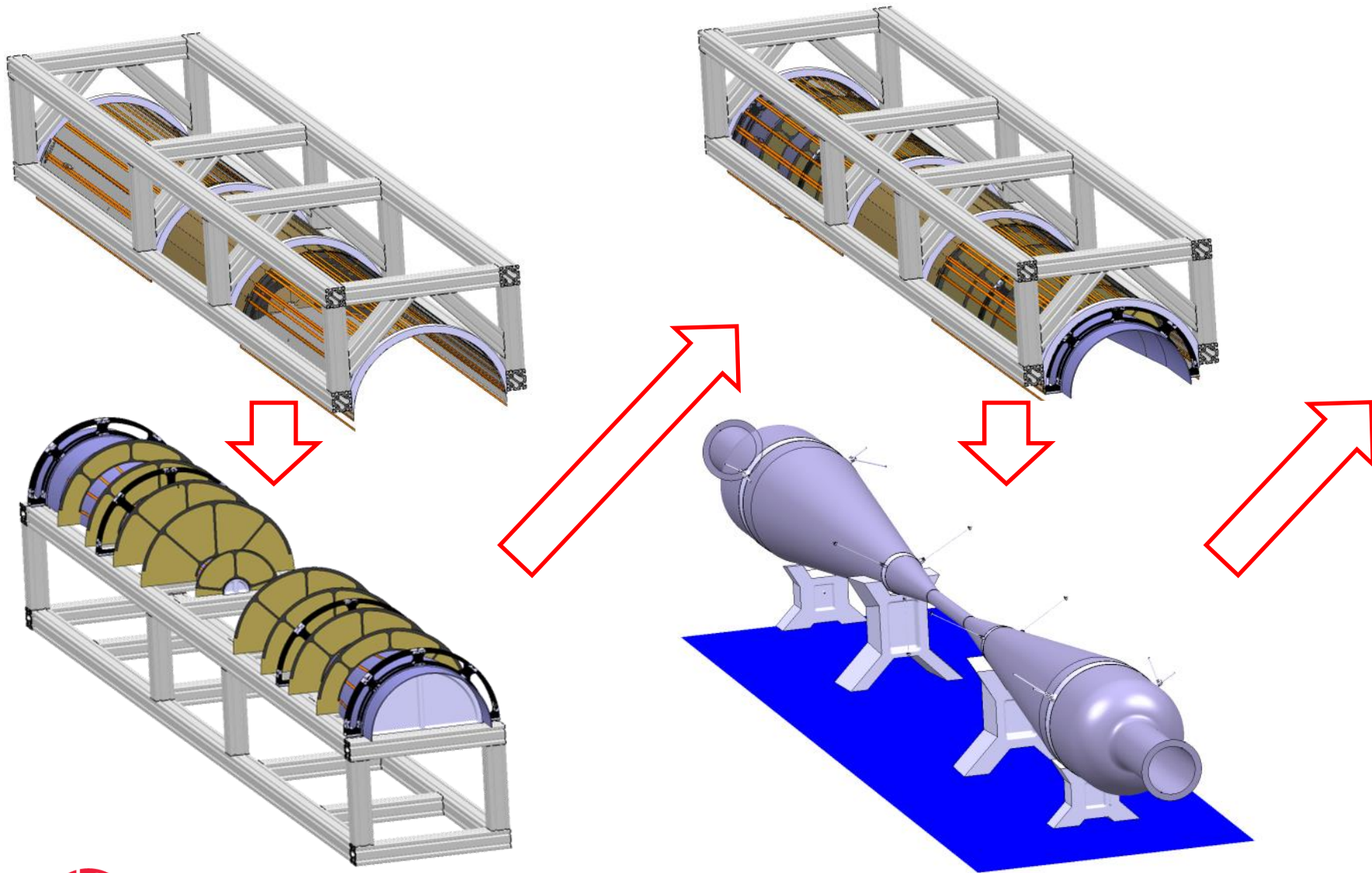
Sub-assembly #1



Sub-assembly #2



Final assembly



Final assembly

