Chapter 1

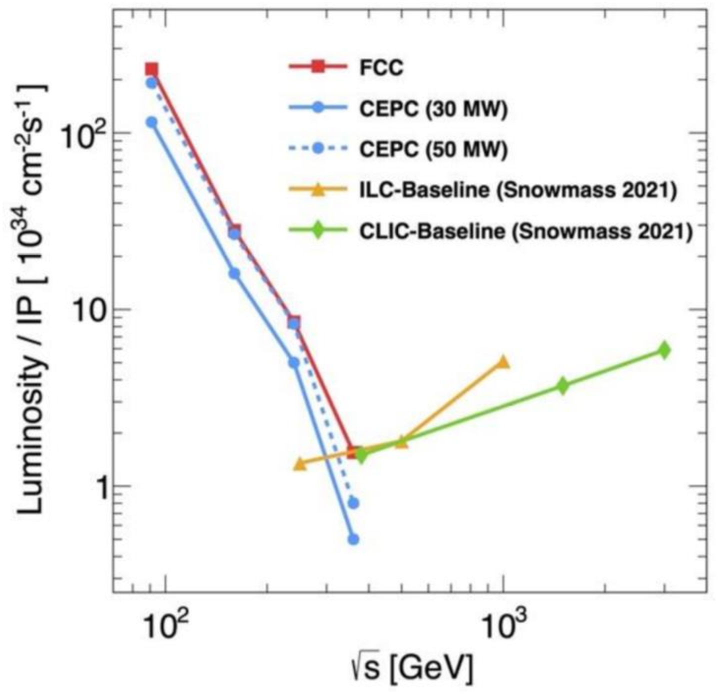


Figure 1.1: Comparison of luminosity per interaction point (L/IP) and collision energy ($\sqrt{s}$) for future collider proposals: FCC, CEPC (30 MW and 50 MW configurations), ILC, and CLIC (Snowmass 2021 baseline designs). Luminosity is normalized to $10^{34}\mathrm{cm}^{-2}s^{-1}$.

Modified

Comparison of Instantaneous luminosity per interaction point(IP)

as a function of center-of-mass energy ($\sqrt{s}$) for future collider proposals:

\gls{FCC}, CEPC (30 MW and 50 MW configurations),

\gls{ILC}, and \gls{CLIC} (Snowmass 2021 baseline designs).

Luminosity is normalized to $10^{34} \mathrm{cm}^{-2}s^{-1}$.

- Still in PNG format → bad quality display → needs to be in pdf
- Caption: no need to define **L/IP** (not used in the plot), should only define **IP**
- Check if should be updated relative to Venice outcome → Manqi will send to Gang

Chapter 2

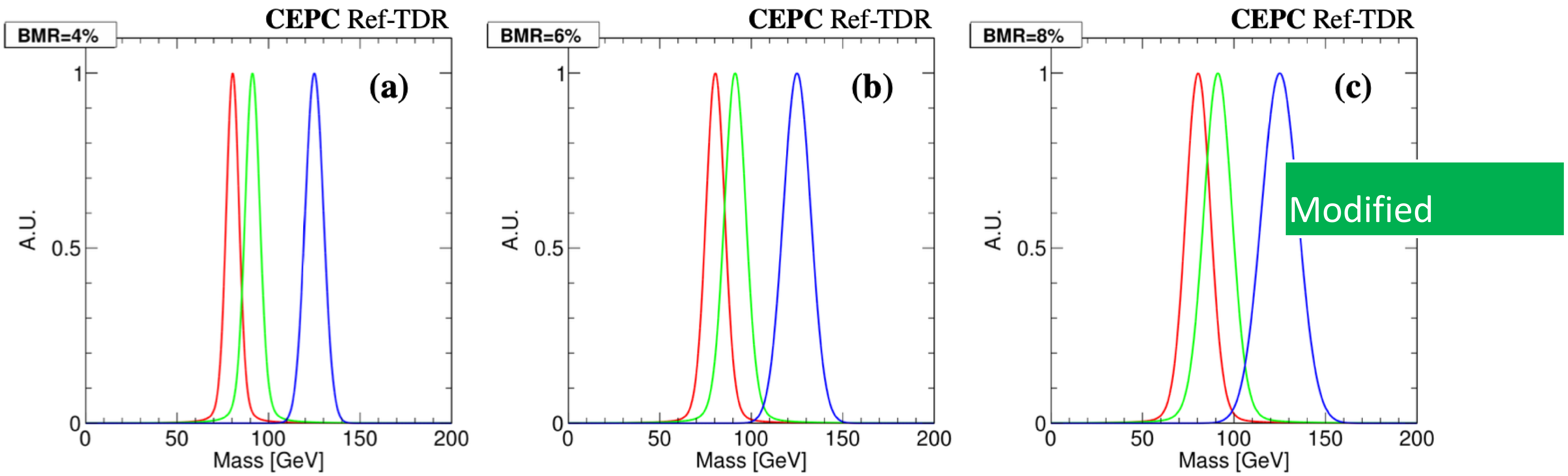


Figure 2.1: Separation of W, Z and Higgs bosons in their hadronic decays with different BMR: (a) 4%, (b) 6% and (c) 8%, respectively.

- Acceptable, but it is better to define (a), (b) and (c) in the Latex, instead of inside of the plot.
  - Usually this is what is done for publications and would allow for a more professional coherent format of the full document
  - Prefer to fix this, unless the plots are not easy to remake

Chapter 2

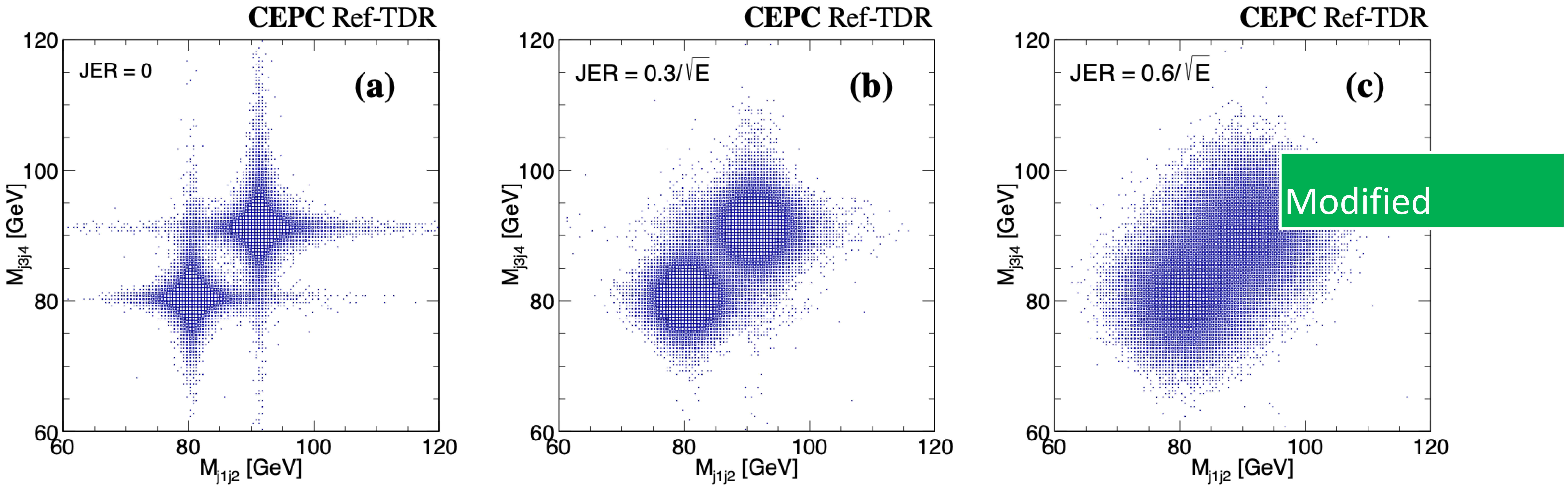
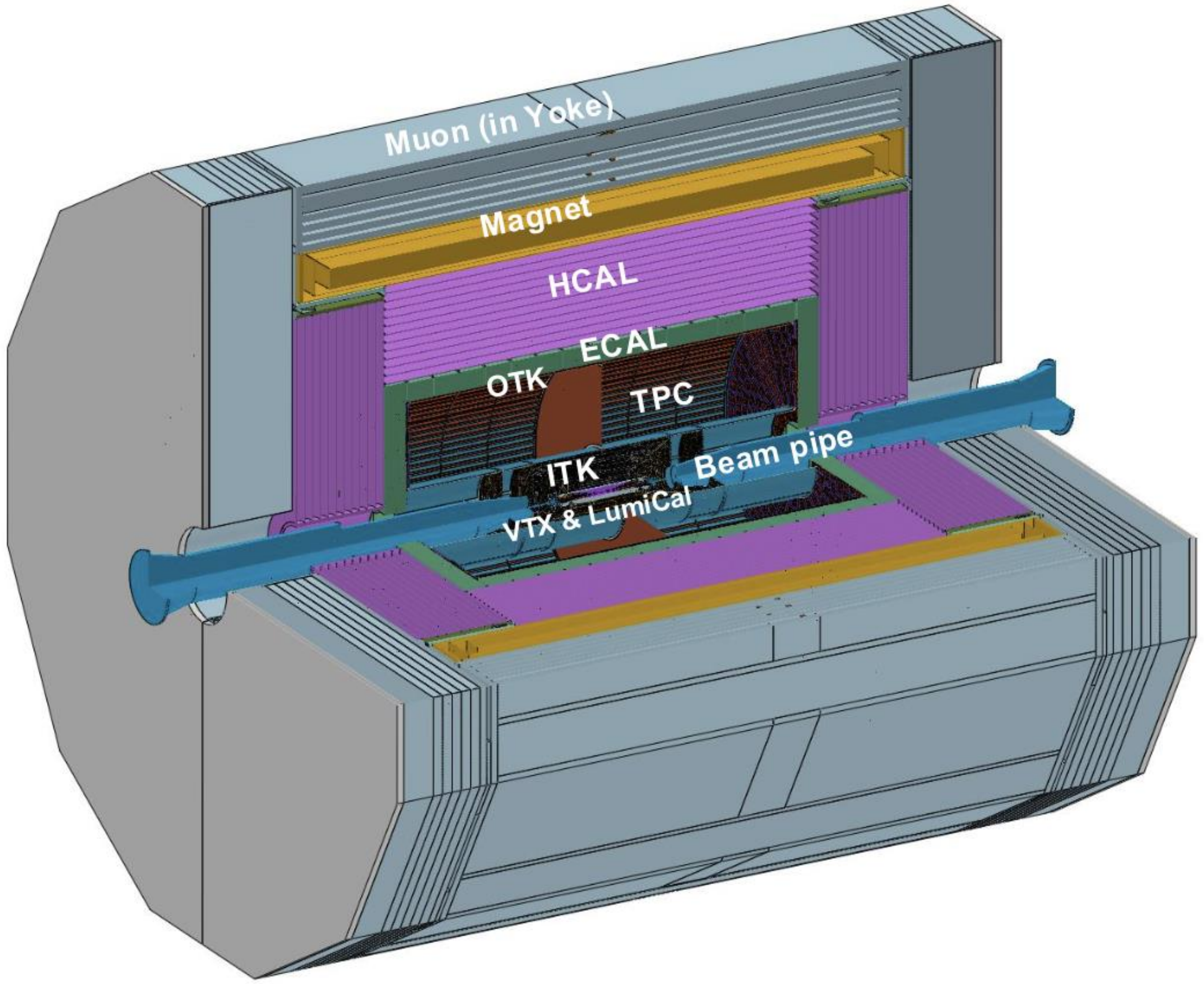


Figure 2.2: Separation of W and Z bosons in their hadronic decays with different jet energy resolutions: (a) $0\%/\sqrt{E}$, (b) $30\%/\sqrt{E}$, (c) $60\%/\sqrt{E}$. A jet energy resolution of $30\%/\sqrt{E}$ is required to well separate the hadronic decays of W and Z bosons.

- Acceptable, but it is better to define (a), (b) and (c) in the Latex, instead of inside of the plot.
  - Usually this is what is done for publications and would allow for a more professional coherent format of the full document
  - Prefer to fix this, unless the plots are not easy to remake

Chapter 2



Modified

Figure 2.3: Schematic diagram of the reference detector design, illustrating its core subsystems. From the innermost to outermost, it includes a silicon vertex, a inner silicon tracker, a TPC tracker, an outer silicon tracker, Electromagnetic CALorimeter (ECAL), Hadronic Calorimeter (HCAL), superconducting solenoid, return yoke with a muon detector, and a dedicated calorimeter for luminosity monitoring which is mounted next to the beampine,

- Update to latest version from mechanics, which does not have the paraffin layer outside of the iron yoke

Chapter 3

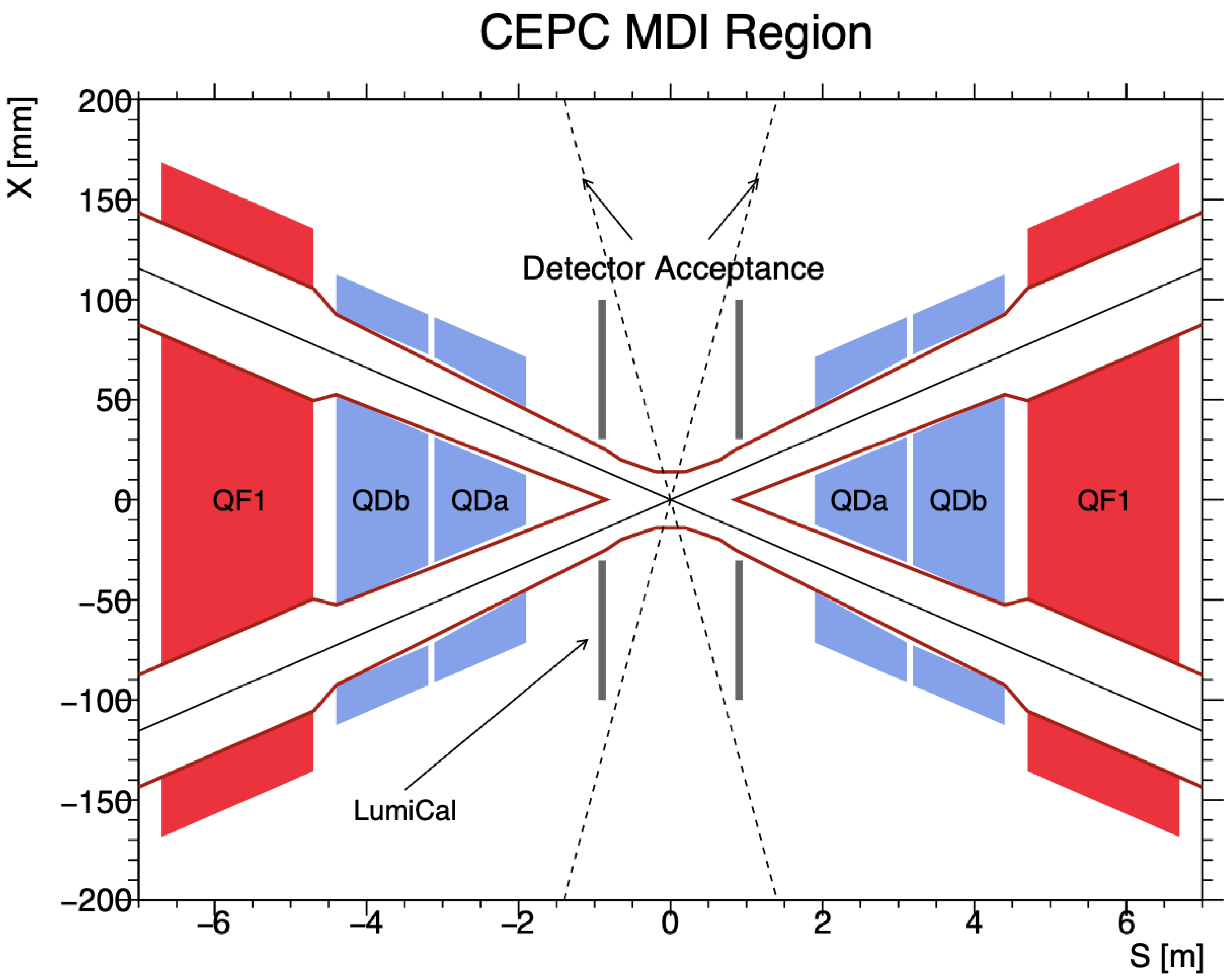


Figure 3.1: Layout of the CEPC interaction region, which is beyond the detector acceptance of $|\cos\theta| = 0.99$.

Modified

- The large top title is not needed, also the figure does not show the FULL MDI region, only the parts outside the detector acceptance, so there is NO detector in this picture
- Caption should explain and define what is being displayed QF? QD? ….. The section is now starting with this figure without any definitions.

Chapter 3

- Acceptable, but the font size could have been increased, which would have allowed for a smaller Figure overall
  - Last week, these figures were side by side. Instead of increasing the font, we made the figure gigantic
  - Currently, the font is still relatively small but it is readable
- It should be made more clear that top figure is deformation and the bottom is stress

Modified

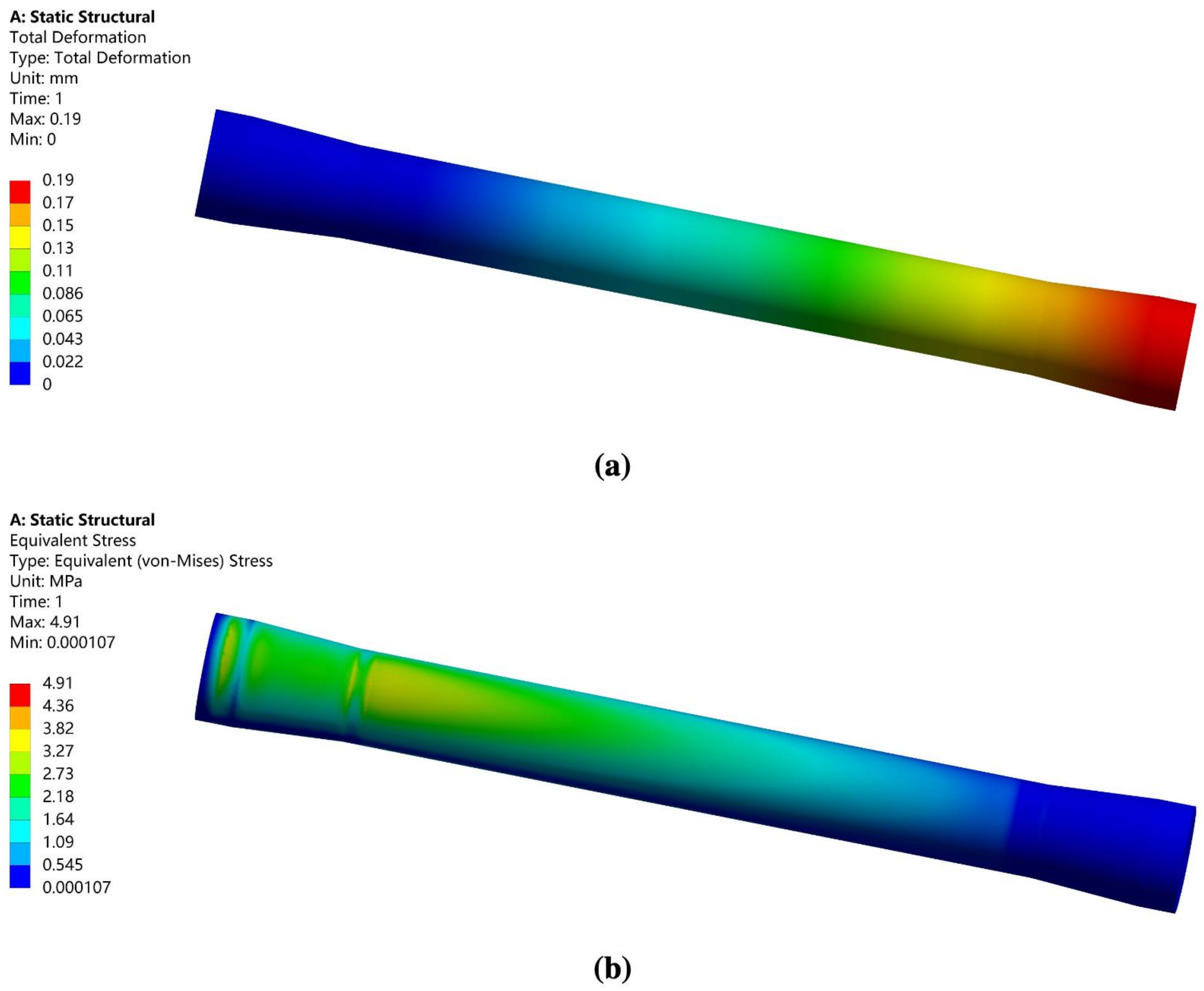


Figure 3.5: Stress analysis of the beam pipe when one end is fixed and the other end is cantilevered. a) The maximum deformation of the beam pipe occurs at the end flange, measuring 0.36 mm. And b) the maximum stress at the outer beryllium pipe is 13.77 MPa.

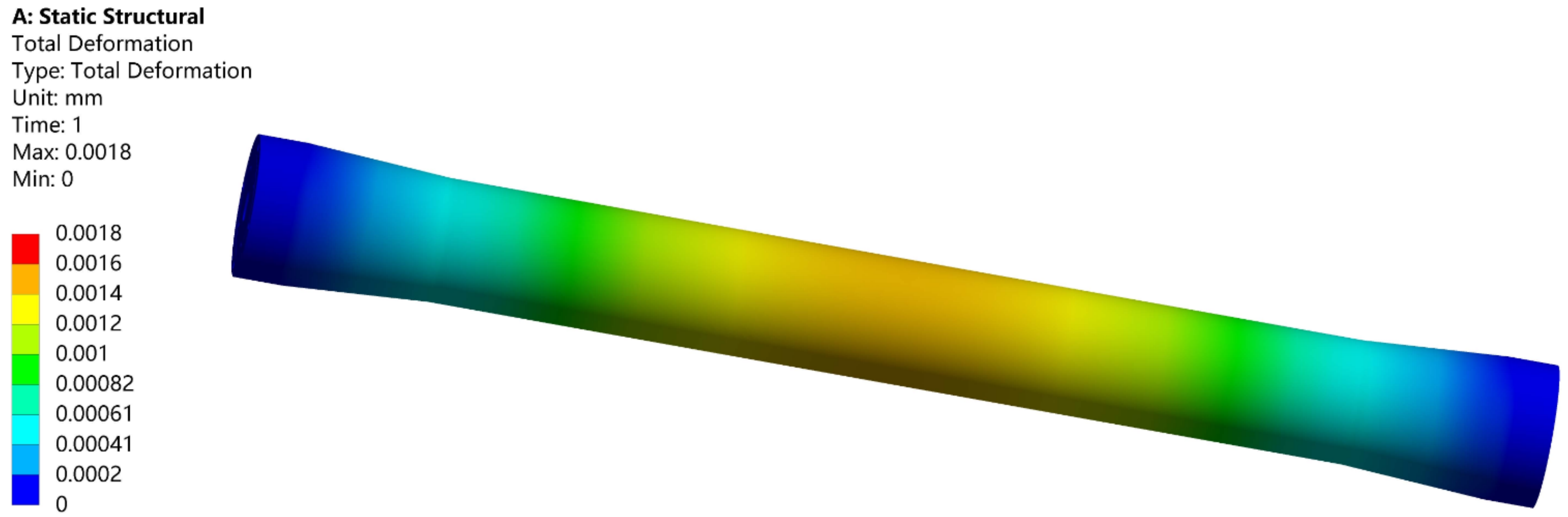
Suggested Caption:
Static structural analysis of the beam pipe when one end is fixed and the other end is **cantilevered**. a) Total deformation of beam beam pipe, with maximum deformation of 0.36 mm at the fixed end flange; b) Equivalent stress (von-mises), showing the maximum stress at the outer beryllium pipe to be 13.77 MPa.

NOTE, these numbers do NOT agree with the figure

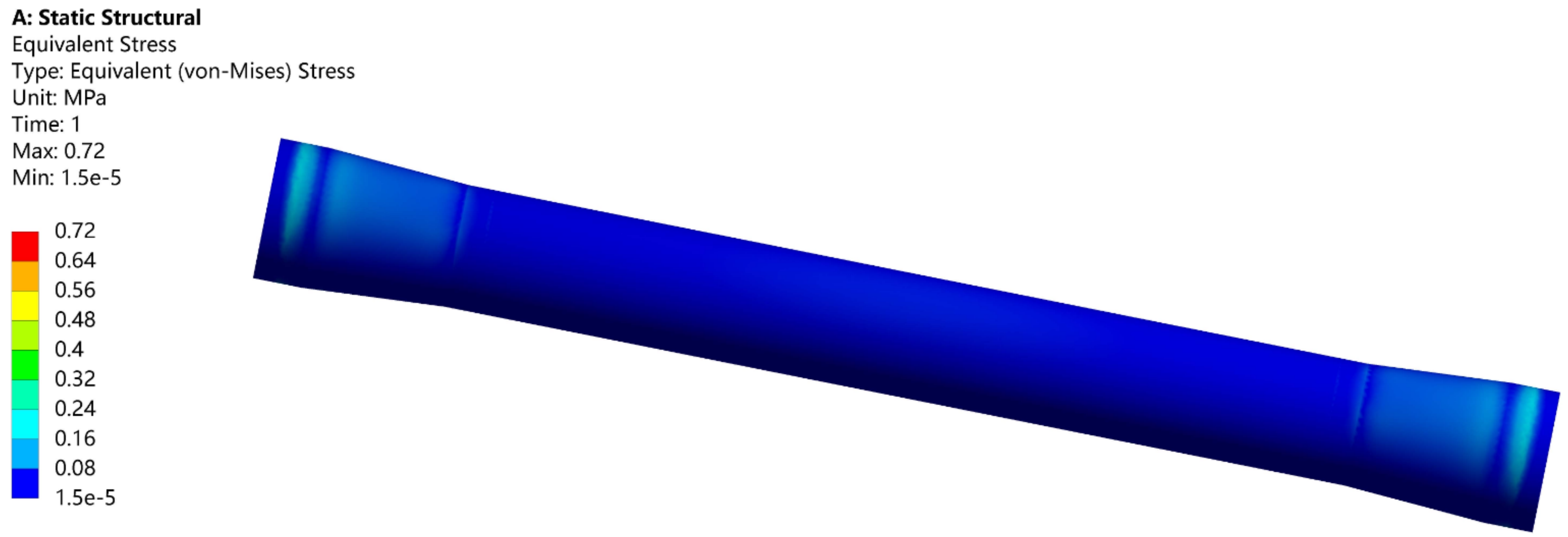
Chapter 3

- Acceptable, similar comments as previous Figure
  - Caption should be modified accordingly to indicate what is the (a) Figure, and the (b) Figure
  - Caption number and numbers in the figures' scale DO NOT match

Modified



(a)



(b)

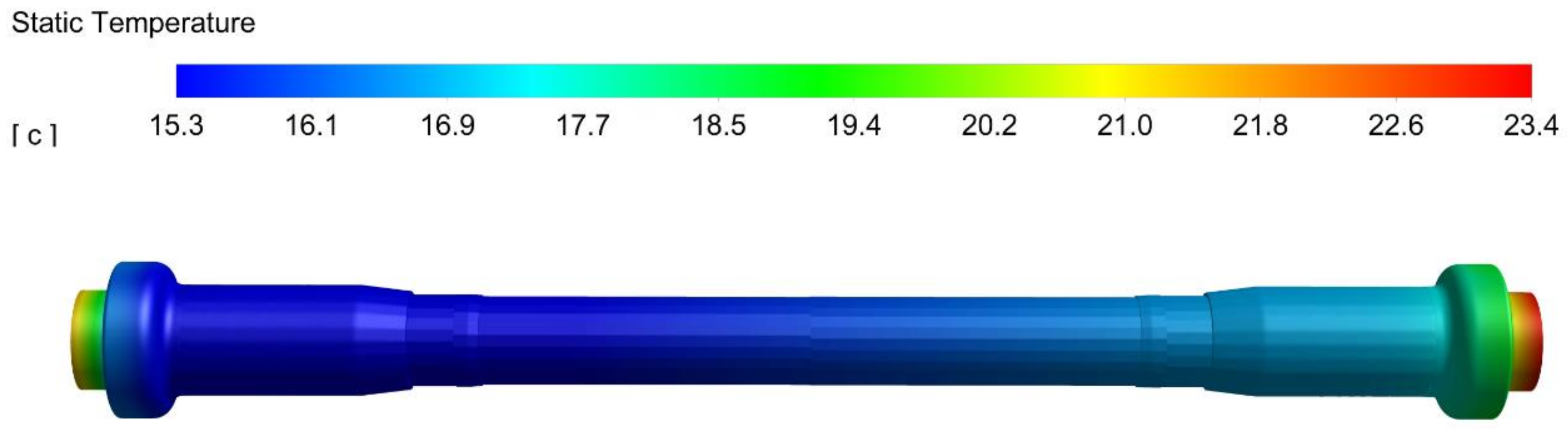
Figure 3.6: Stress analysis of the beam pipe when both ends are fixed. a) The maximum deformation of the beam pipe occurs at the middle of the extending aluminum pipe, measuring 0.19 mm. And b) the maximum stress is at the connection between the end flange and the extending aluminum pipe and reaches 15.57 MPa.

NOTE, caption numbers do NOT agree with the figure

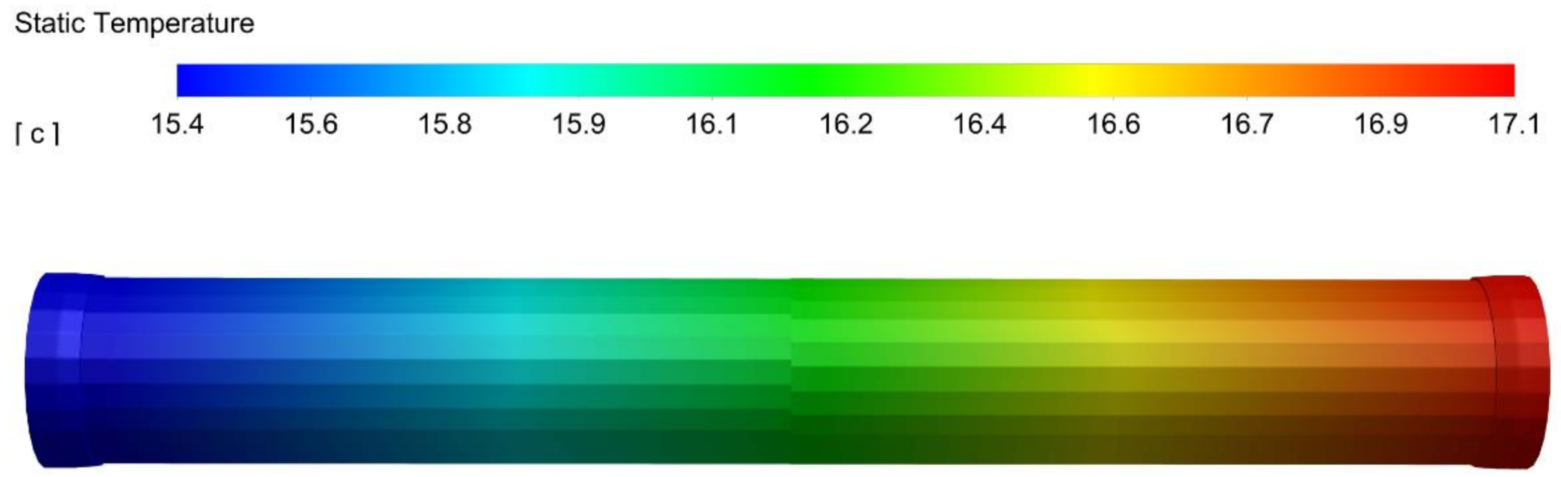
Chapter 3

- Reduce the empty space between the figures and the (a), (b) labels, and between figures.
- Caption does not mention in what conditions this temperature distribution is observed. Need to be included
- (Figure updated since last week's meeting)

Modified



(a)



(b)

Figure 3.7: Temperature distribution of the central beryllium pipe. a) shows the inner beryllium pipe with a maximum temperature of 23.4 °C, while b) shows the outer beryllium pipe with a maximum temperature of 17.1 °C.

Figure 3.7: Temperature distribution of the central beryllium pipe when water cooled. a) Shows the inner beryllium pipe with a maximum temperature of 23.4◦C, while b) shows the outer beryllium pipe with a maximum temperature of 17.1◦C.

Chapter 3

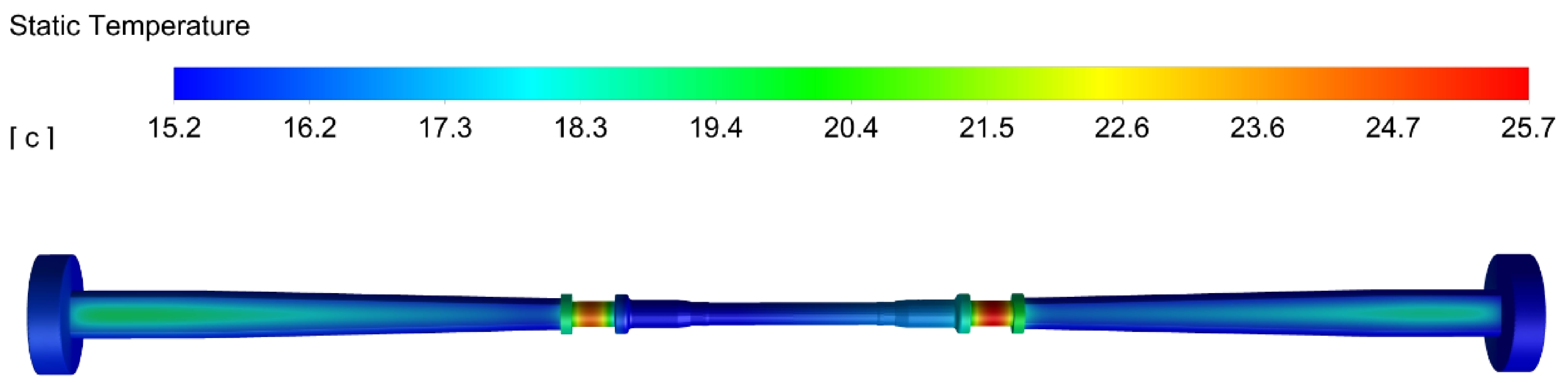


Figure 3.8: Temperature distribution of the beam pipe. The maximum temperature of the beam pipe reaches 25.7 °C at the junction between the cooling outlet end of the central beryllium pipe and the extending aluminum pipe.

Modified

- Reduce the blank empty space between the figures and caption

Chapter 3

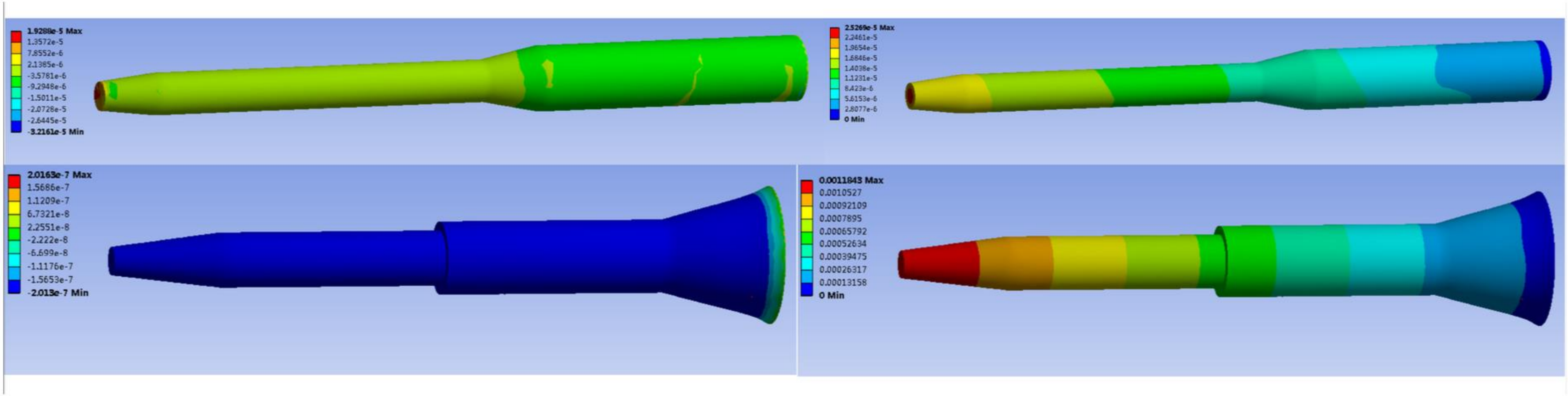


Figure 3.9: Stress analysis of the cryomodule.

Modified

- Font is too small to be readable → increase
- Add sub-figures (a), (b), (c) , (d)
- Explain what we are seeing in these 4 figures

Chapter 3

- Angle not Angel … Angels are in heaven :-
)
- Explain why the energy cut-off and give a
  value for it

Modified

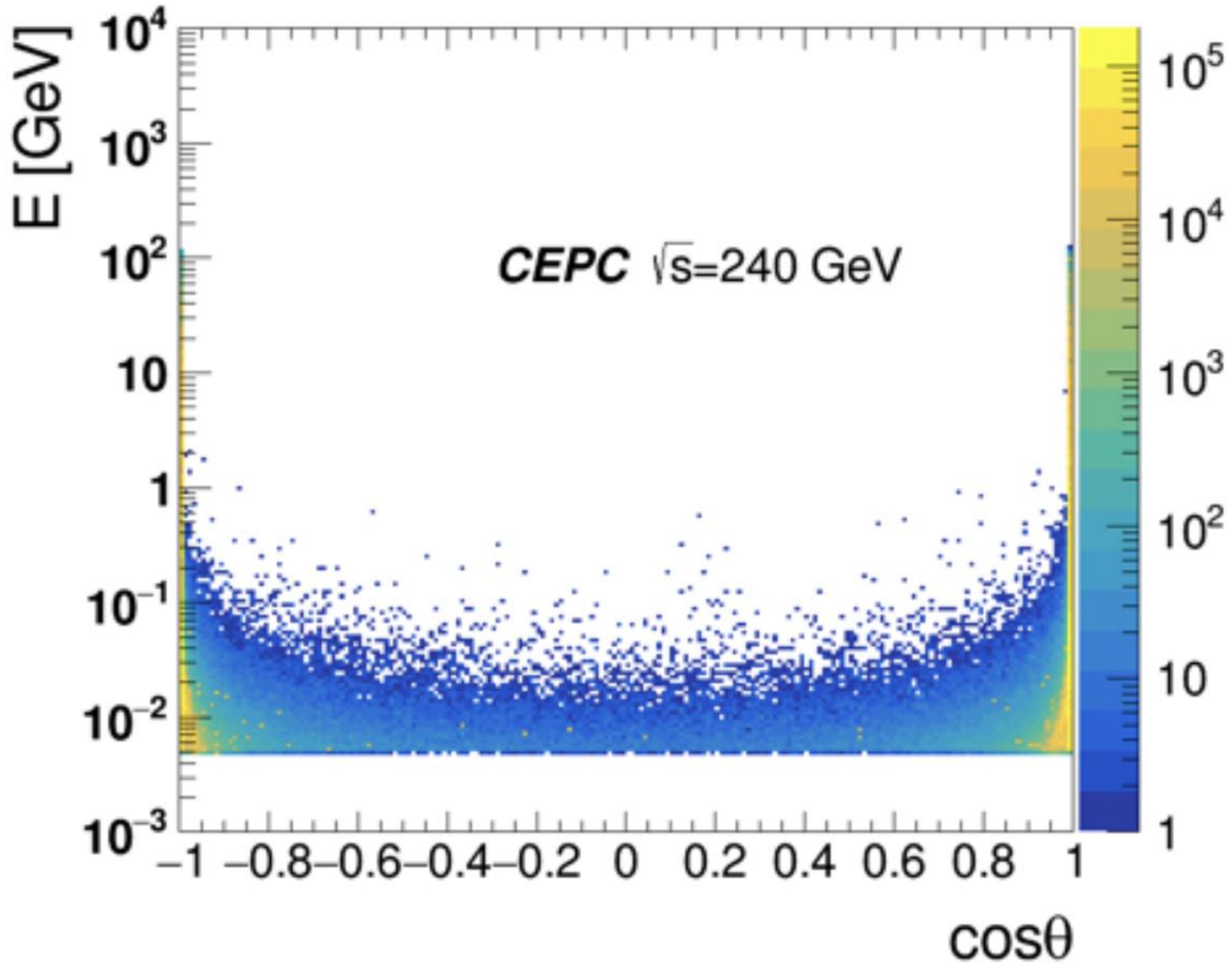


Figure 3.10: The energy and polar angel distribution of particles out of the pair production at the ZH operation mode.

Better caption

Figure 3.10: Energy and polar-angle distribution of particles from pair production beam-induced background during ZH operation mode.

Chapter 3

- Plot ok, but **caption** needs improvements
- Don't make excessive use of acronyms. Captions should be informative to the reader.
  - TSK, BGS, MDC…
- Data/MC is already a "ratio"… no need to explicitly mention it!
  - No point of using again Data/MC in caption. Should be explicit. Data/MC is jargon

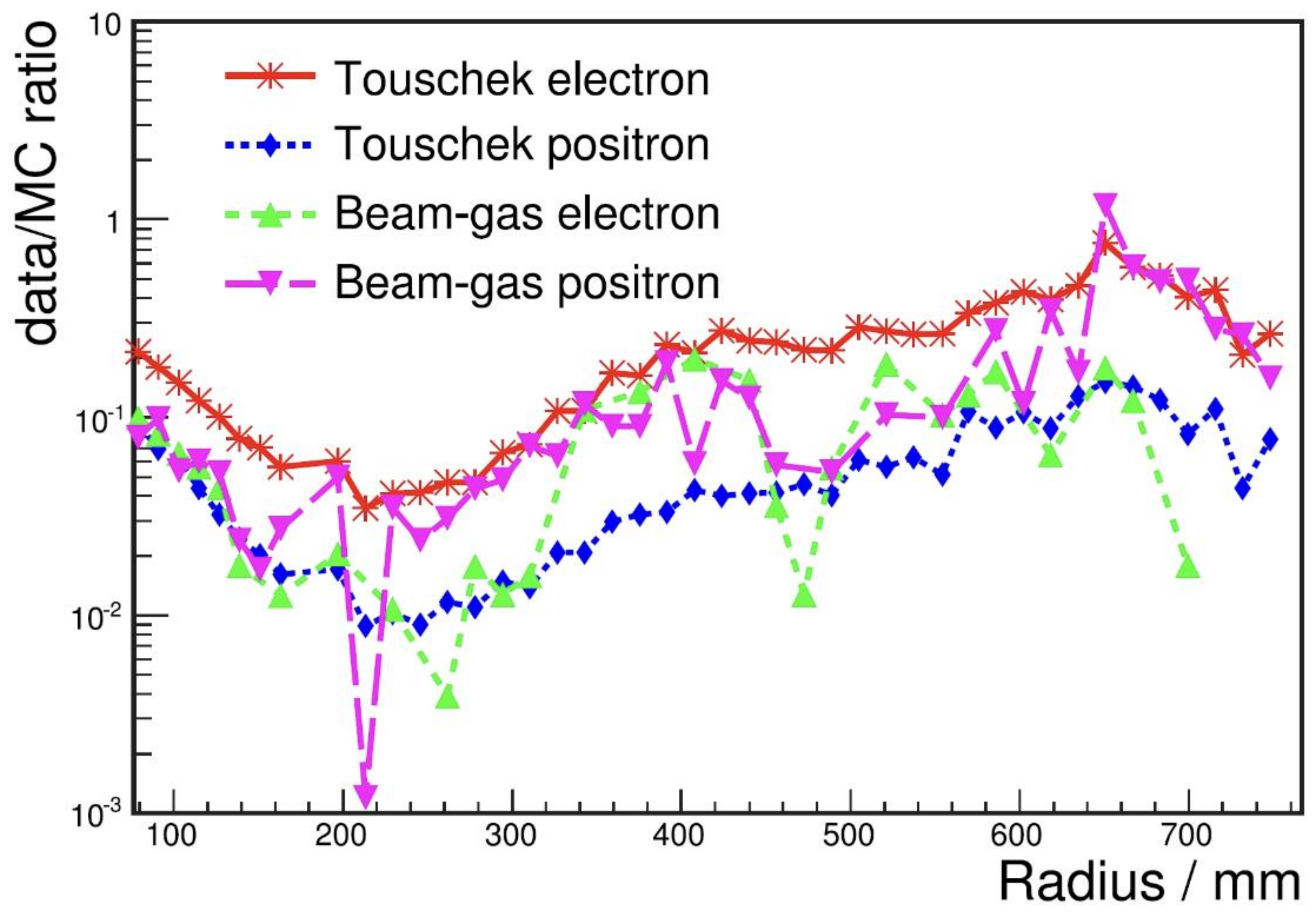


Figure 3.11: Data/MC ratios for both electron and positron beams are plotted for TSK and BGS backgrounds at different MDC layers (taken from Ref. [18]).

Modified

Better caption

Figure 3.11: Data to Monte Carlo ratios for both electron and positron beams are shown for Touscheck and beam-gas scattering, at different radial layers of the Main Drift Chamber (MDC) in BES III (taken from Ref. [18]).

Chapter 3

- Plot does not follow the recommended format
  - Font is too small compared to the size of the plot
  - Plot is unnecessarily large
- All those acronyms should be mentioned in the caption for clarity (BGC, BTH, BGB, TSC)
- Caption does not explain plot clearly

Modified

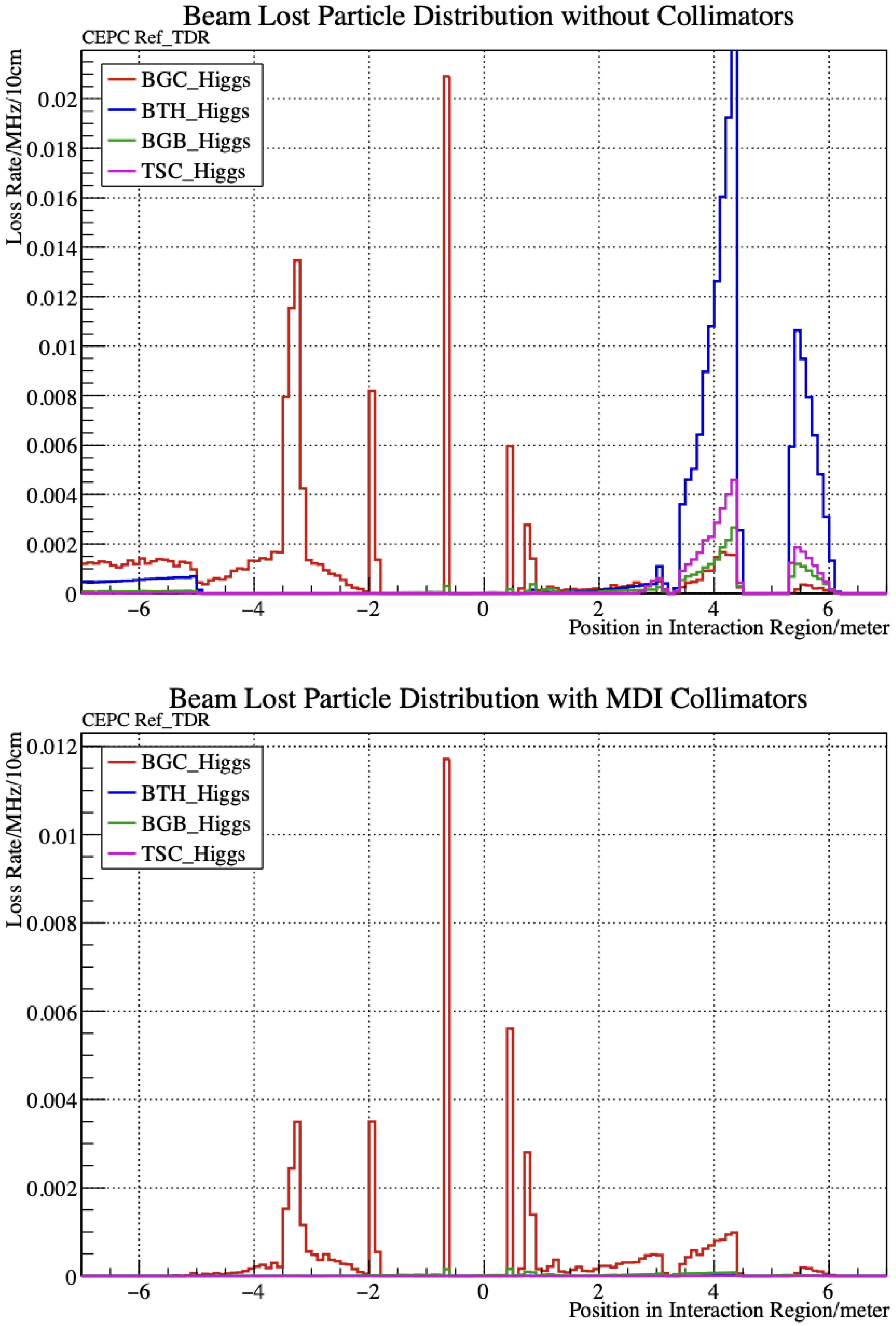


Figure 3.12: The effectiveness of the IR collimators when operating in the H mode. The beam loss rates due to different beam backgrounds are plotted before (upper) and after (lower) the implementation of the collimators.

Chapter 3

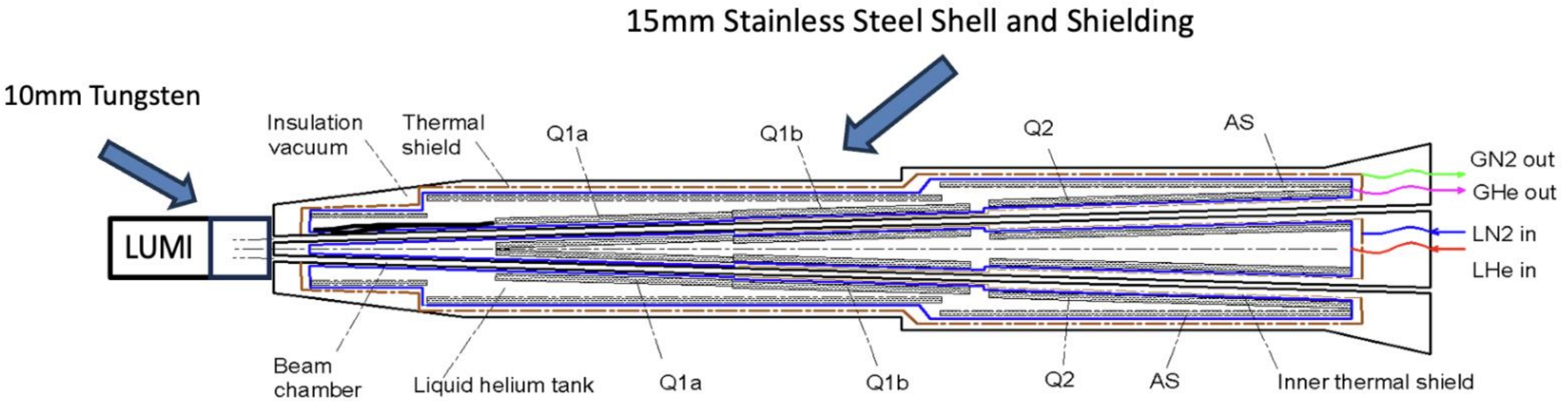


Figure 3.13: Illustration of the shielding surrounding the IR cryomodule. A 10 mm tungsten serves as the outer shell of the LumiCal and IP BPM, while a 15 mm stainless steel shell is introduced as the shielding.

- There are many symbols in this figure that are not defined. They need to be defined in the caption
  - What is LUMI?

Modified

Chapter 3

- Plot titles not clear. What does LUM mean in this context? “Dose” is jargon
  - Missing sub-figure labels (a) (b)
  - Caption should clearly state of figure (a) and (b)

Modified

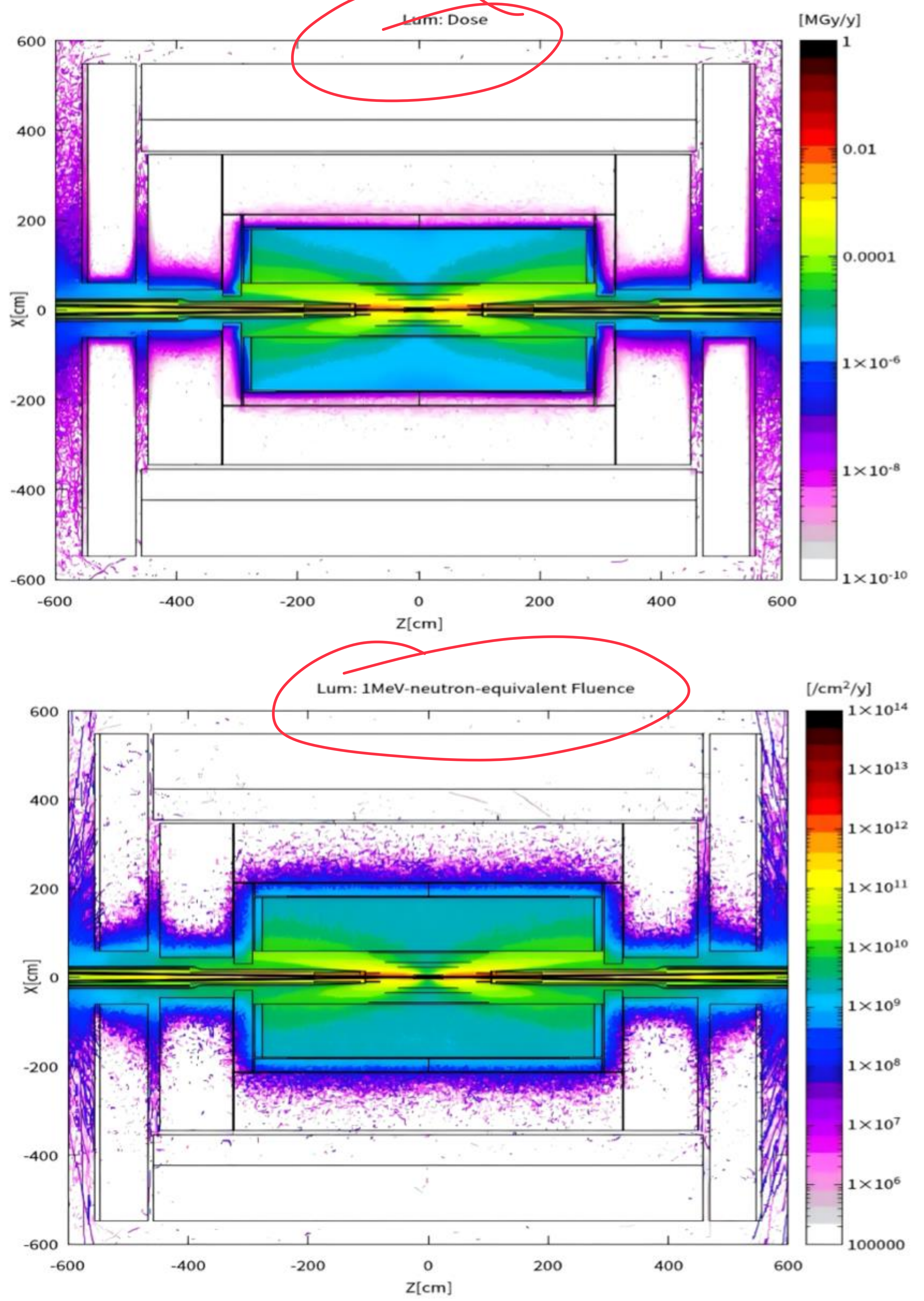


Figure 3.14: The TID and NIEL distributions caused by pair production for the CEPC detector. The highest TID reaches 0.2 MGy per year, while the highest level of NIEL is on the order of 10^{13} 1 MeV n_{eq} cm^{-2} per year.

Chapter 3

Modified

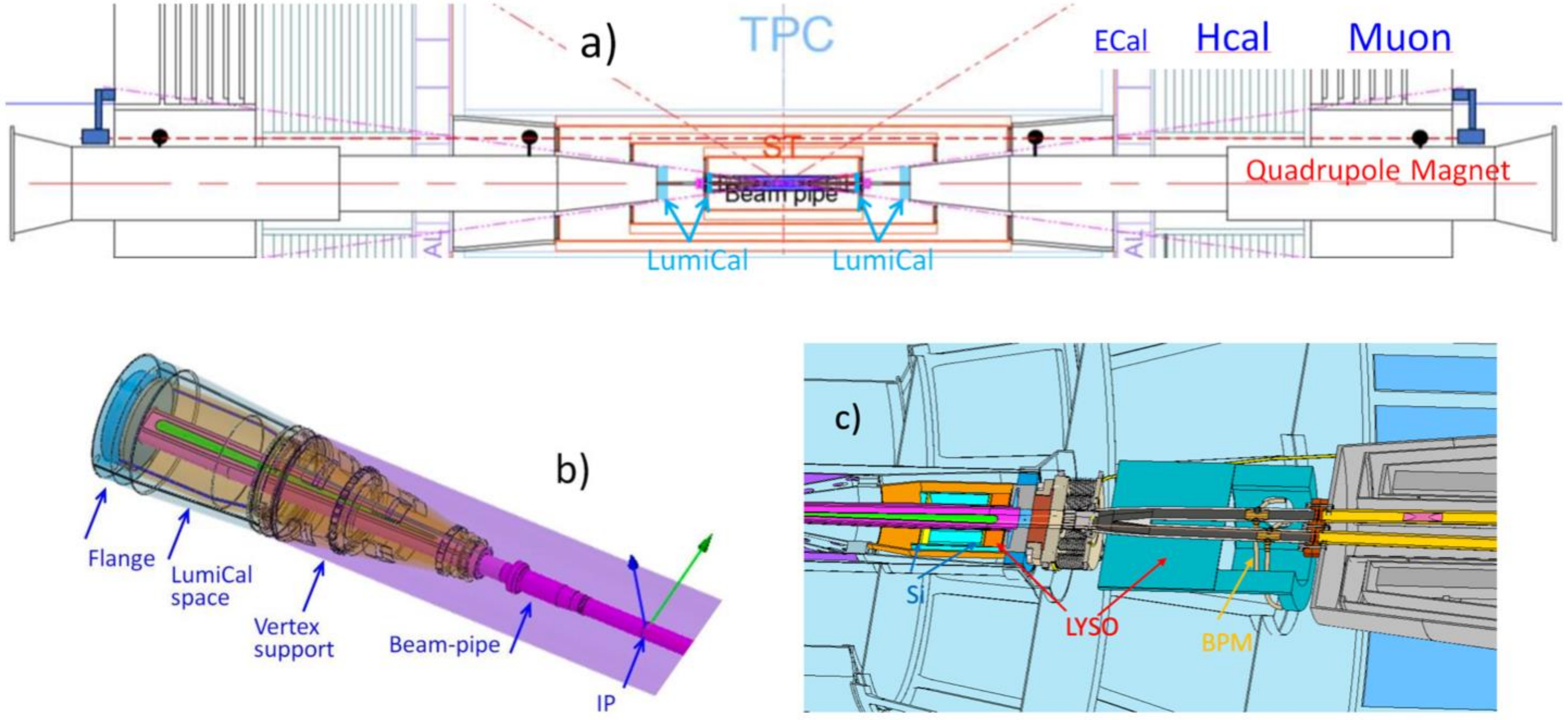


Figure 3.15: The MDI region is illustrated in a) the yz-view across the two quadrupole magnets; b) the IP to beam-pipe flange at $|z| = 700$ mm showing the beam-pipe (purple) vertex detector support and the volume before flange (blue) for LumiCal; c) the x-z cut view of the LumiCal before flange, the bellow, and the long crystal before the BPMs and the quadrupole magnet.

- Top figure is an overview plot of the MDI region. It should be in the overview section, not here in the luminosity detector part.
- The word "beam pipe" is over the lines of the plot, not easily readable
- (b) plot needs to be in the overview section. It is not specific to the luminosity detector.

Chapter 3

Modified

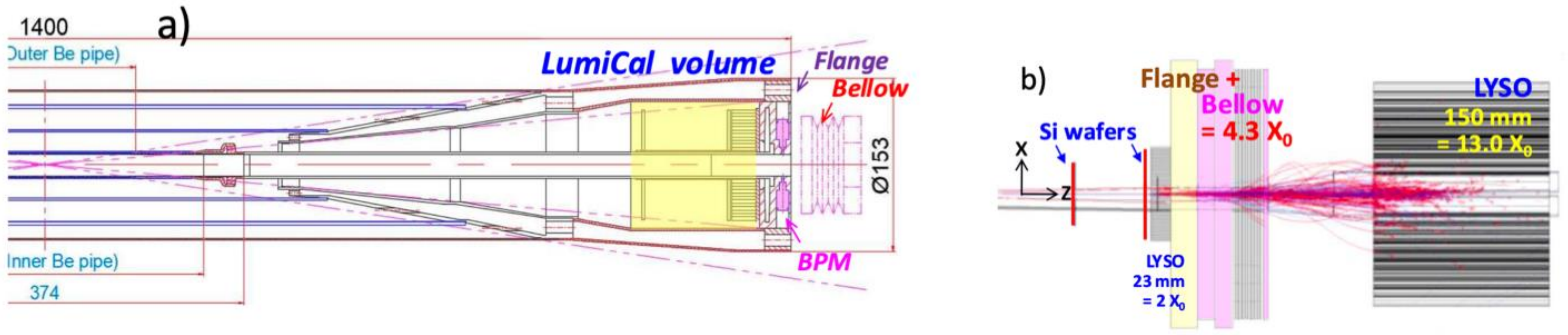


Figure 3.16: The LumiCal volume before the flange is shown in a), where two Si-wafers are positioned before 2 X_0 LYSO bars. Inside the flanges in each side, 50 GeV electron shower illustrated. Before the flange, the Si-wafers with short LYSO crystals provide electron θ position with e/γ veto. The long LYSO behind the bellow provide beam electron identification by energy deposits. The LYSO length has assumed to be 150 mm.

- Labels (a), (b) should be done in Latex, if possible
- Some dimensions have ranges not well defined. They should be repeated anyway. Some labels are too small and cut
- (Not clear we need drawing (a) in addition to what was already included before
- Drawing style of these figures is not consistent with other mechanical figures

Chapter 3

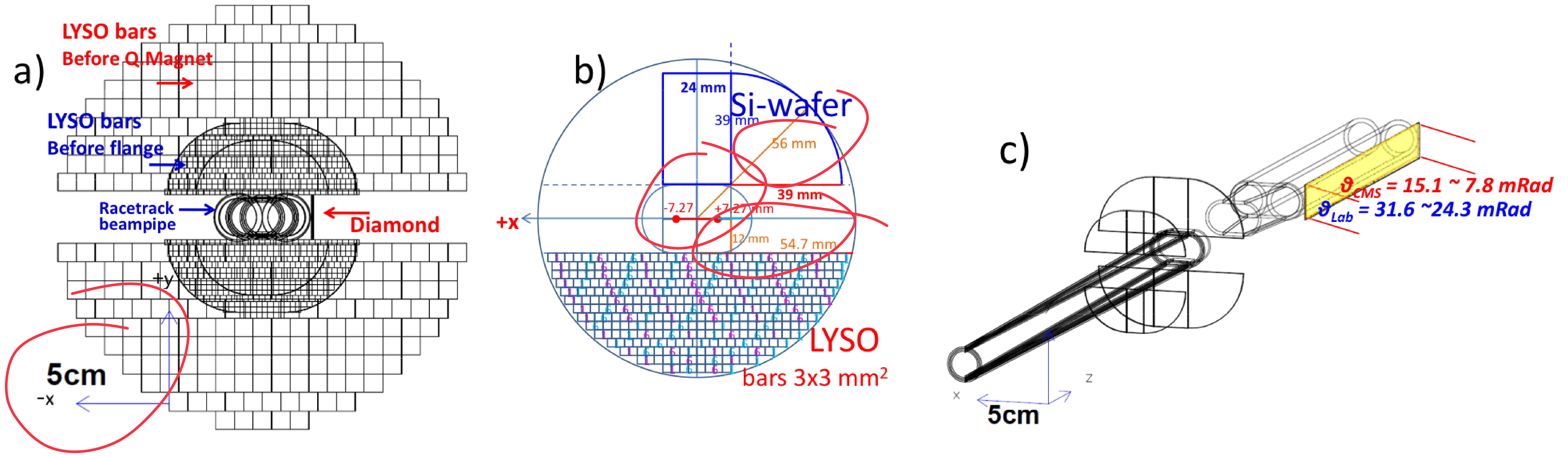


Figure 3.17: The projection of LumiCal design is illustrated in a), with the racetrack beam pipe from IP to quadrupole. The design of the second Si-wafer at $|z| = 640$ mm and the 2 X_0 of LYSO bars mounted on the flanges are plotted in b). The front LYSO bars dimension is $3 \times 3 \times 23$ mm^3. The long LYSO modules behind the bellow are segmented in $10 \times 10 \times 150$ mm^3. The fast monitoring diamond detectors in c) are positioned between the long LYSO modules on the sides of electron boosted direction, where the Bhabha electron rate is the highest.

- Labels (a), (b) should be done in Latex, if possible
- What is 5 cm on the (a) drawing?
- Some text still too small

Modified

Not modified

Chapter 3

Modified

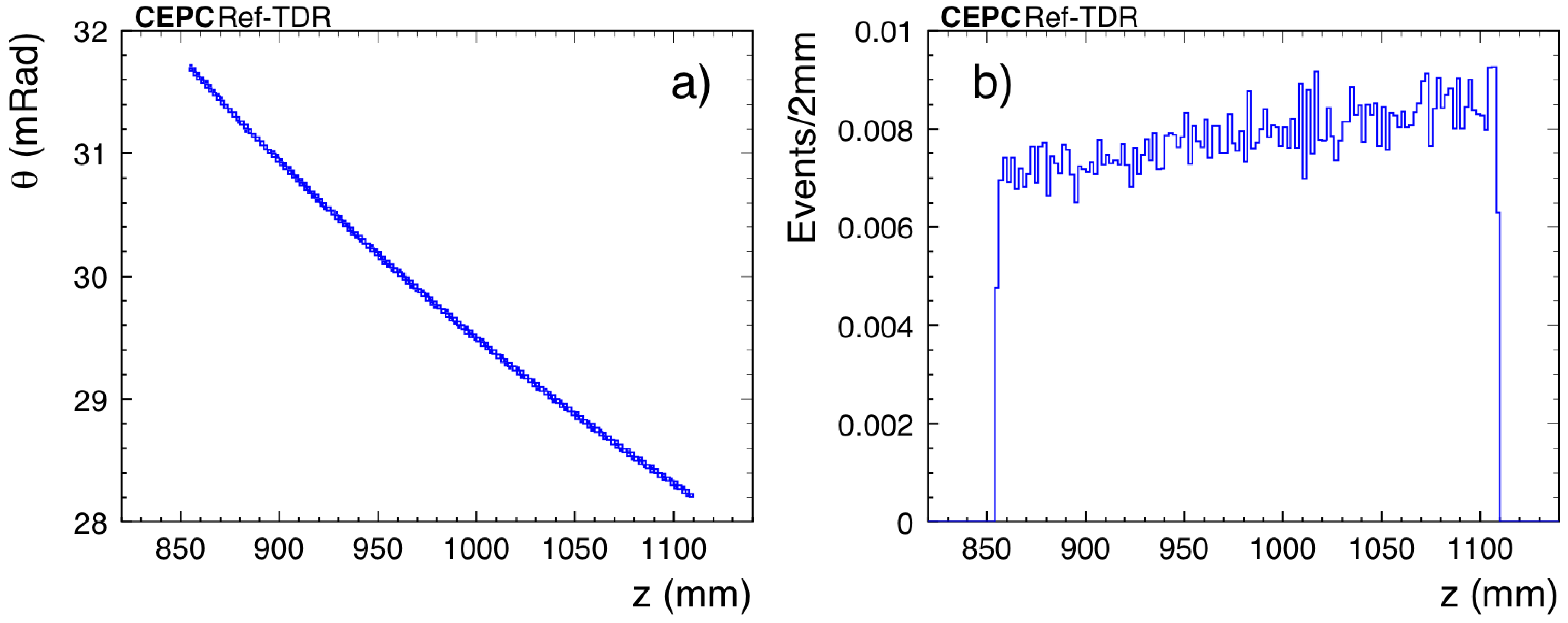


Figure 3.18: A shower passing 3 mm Cu beam-pipe for a 50 GeV electron at 10 mrad to the outgoing beam direction of 16.5 mrad. The diamond slab (24×320 mm^2) is located on the side of beam-pipe at 13 mm to beam center. The hits on diamond slab is plotted in a) for the theta versus z in laboratory frame. The event rate (normalized to 1) in z is plotted in b).

- Labels (a), (b) should be done in Latex, if possible
- Radians (rad) is capitalized in the figure axis, and not in the caption! It should not.
- Caption overdone here — We don't see a shower in these plots. Start by providing information about the plot, then give details as needed.
- The y-axis of plot (b) indicates that the number of events are normalized by the bin size. This plot is not the number of events per bin, but the "event fraction" per bin. "normalized to 1" is jargon. The plot is normalized to the total event integral, or total number of events.

Chapter 3

Modified

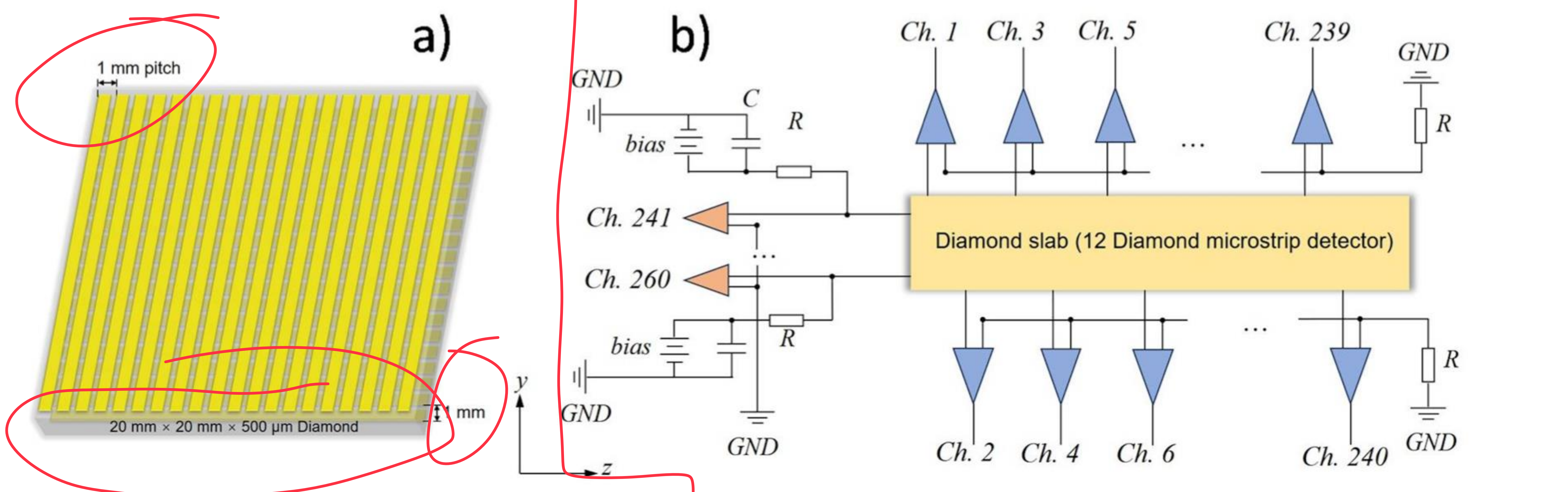


Figure 3.19: a) Schematic of the microstrip diamond sensor with orthogonal front-side and backside microstrips, featuring a 1 mm pitch; b) Illustration of the microstrip readout for a diamond slab, where the front-side microstrips (Channels 1–240) are connected to preamplifiers for measuring z-axis IP offsets, while the backside microstrips (Channels 241–260) are connected to high voltage for measuring y-axis IP offsets.

- Labels (a), (b) should be done in Latex, if possible
- Font size for the dimensions of the chip is too small. Increase it if possible, if really not possible mention it in the caption.
- Increase blank horizontal space between figures. They almost look like the same figure

Chapter 3

Modified

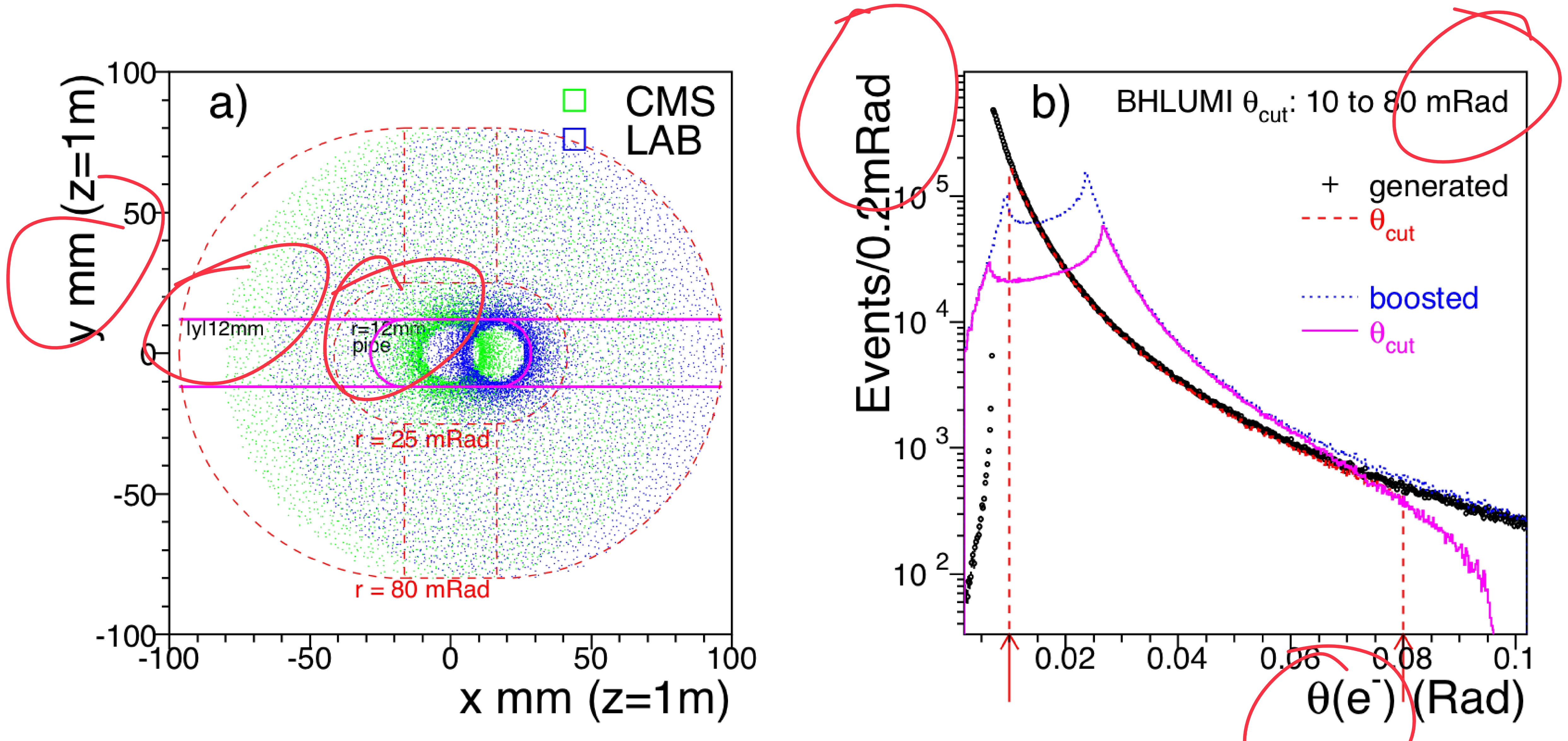


Figure 3.20: a) scattered electron distributions of BHLUMI simulations at CMS frame and after boost for the 33 mrad beam crossing at CEPC. Events are generated for $10 < \theta < 80$ mrad. The Acc0, Acc1 are selections according to the BHLUMI for LEP applications. b) the back-to-back angles of e^+ and e^- are plotted for the generated and boosted, and the Acc0 selected with and without radiative photon.

- Labels (a), (b) should be done in Latex, if possible
- Font size for the dimensions on left plot still too small
- Define what CMS stands for
- The units in the axis are not consistent. Sometimes they are within (), sometimes they are just there.
- Radians should not capitalized

Chapter 3

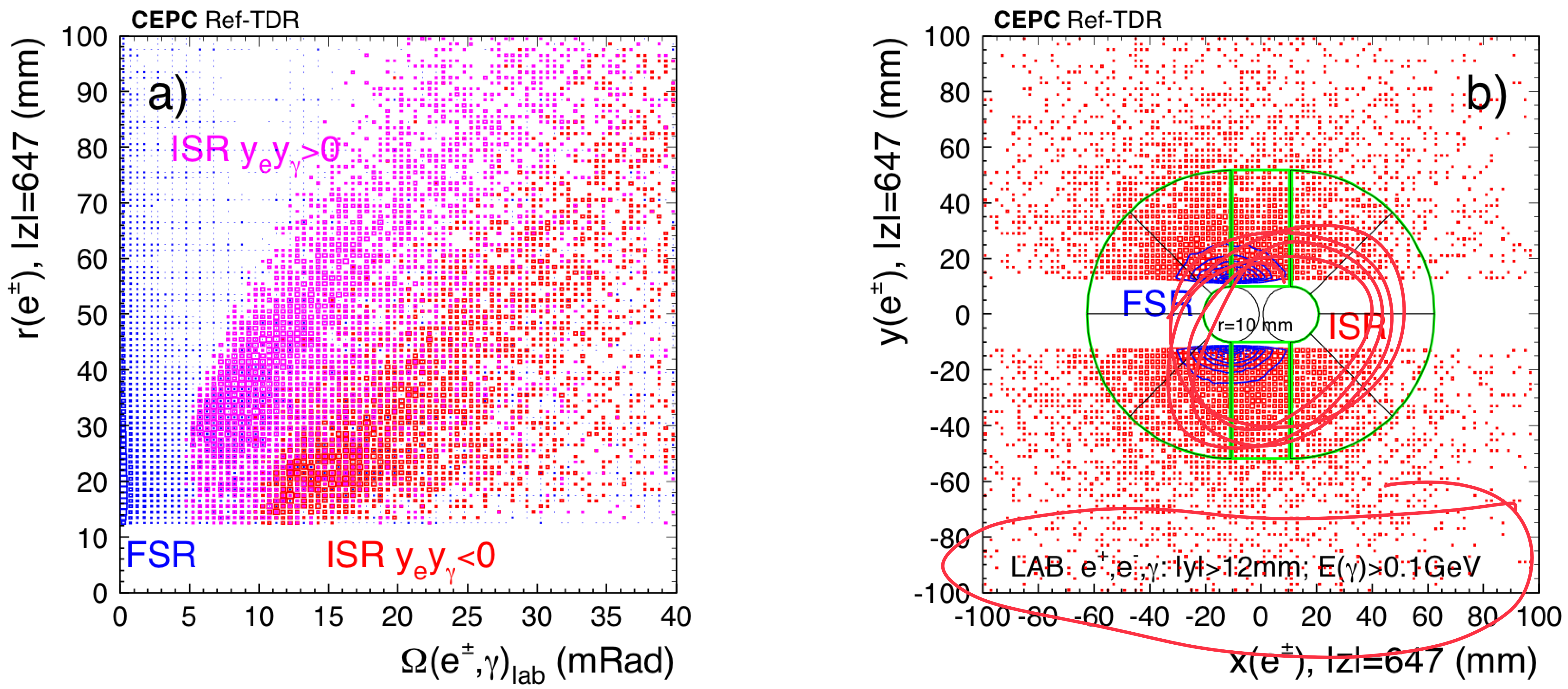


Figure 3.21: Event with radiative photon ($E_\gamma > 0.1$ GeV) are plotted for e, γ separation. a) the scattered electron position in front of LYSO is plotted for the LAB frame x-y radius vs e, γ opening angle in the same z-hemisphere. b) the electron hit positions in LAB x-y frame are shown. In case of FSR both e and γ are close beam pipe; with an ISR, e and γ are spread wider.

- Labels (a), (b) should be done in Latex, if possible
- Font size for the dimensions stil too small.
- Text should not be written over data
- LAB should not be capitalized
- Caption should explain why using this specific Z = 647 mm value

Modified

Chapter 3

Modified

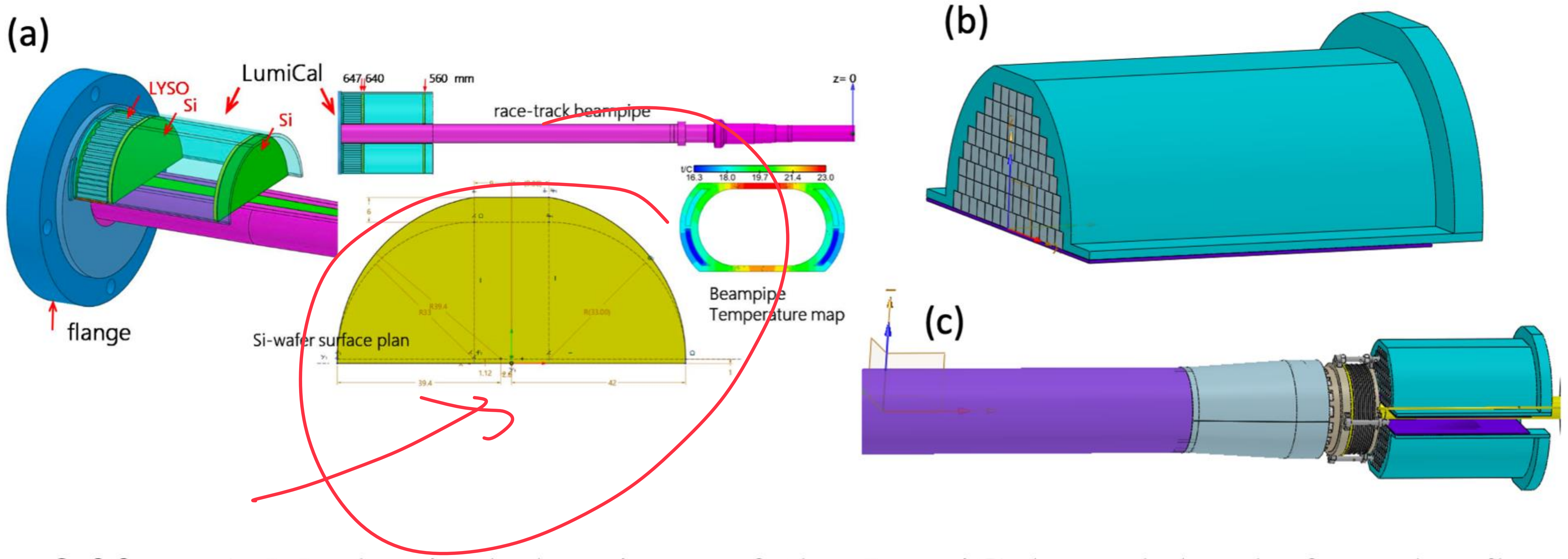
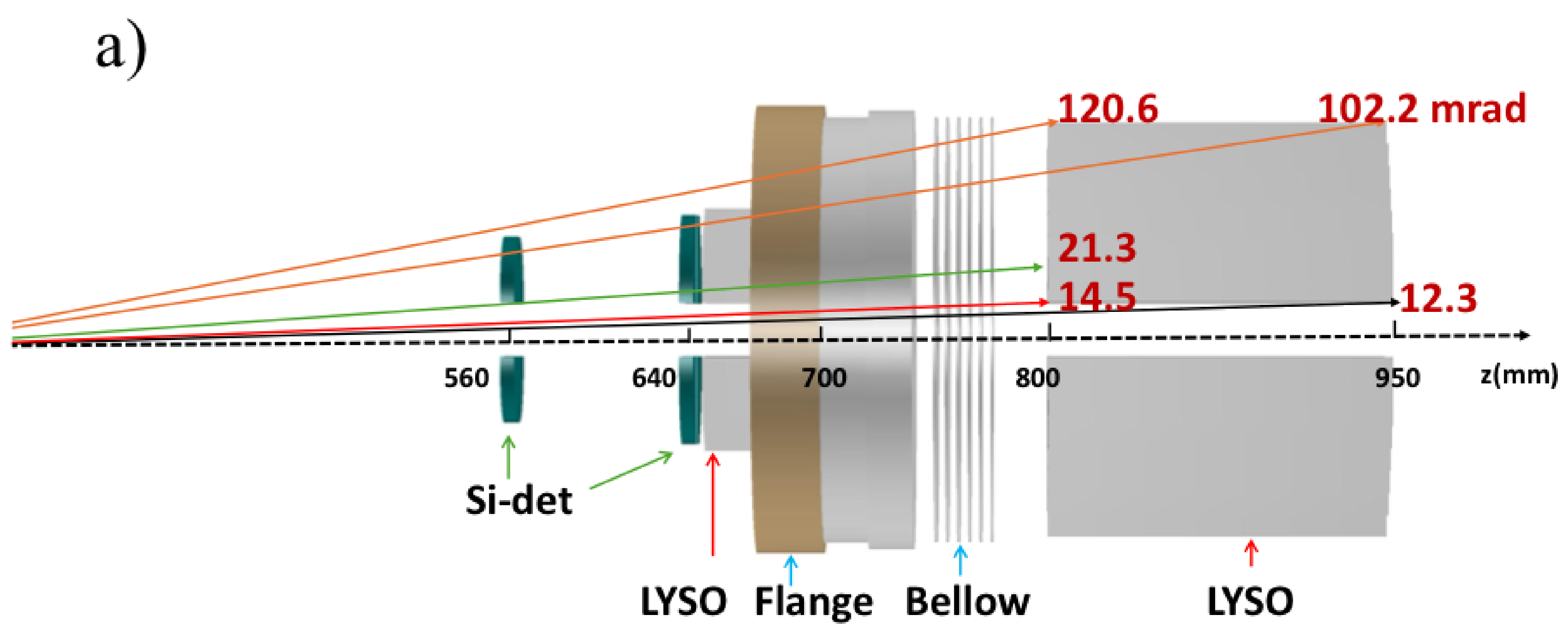


Figure 3.22: a) Mechanical drawings of the LumiCal modules before the flange of race-track beam-pipe. The two Si-wafers and $2X_0$ LYSO crystal bars are contained in half circular tubes above and below the pipe. The cooling of beam pipe has the water injected from the flange toward IP within the double Aluminum layers on the sides with the temperature map illustrated, b) Mechanical drawings of the LumiCal module beyond the flange, the $13X_0$ LYSO crystal bars covered by tungsten shell, and c) The LumiCal LYSO modules are contained in half circular tubes above and below the pipe.

- Labels (a), (b) should be done in Latex, if possible
- Some font sizes still too small, particularly for the dimensions. This was pointed out many times already, including last week.
- There is some horizontal space so the figure can be more separated and larger if needed

Chapter 3

Modified



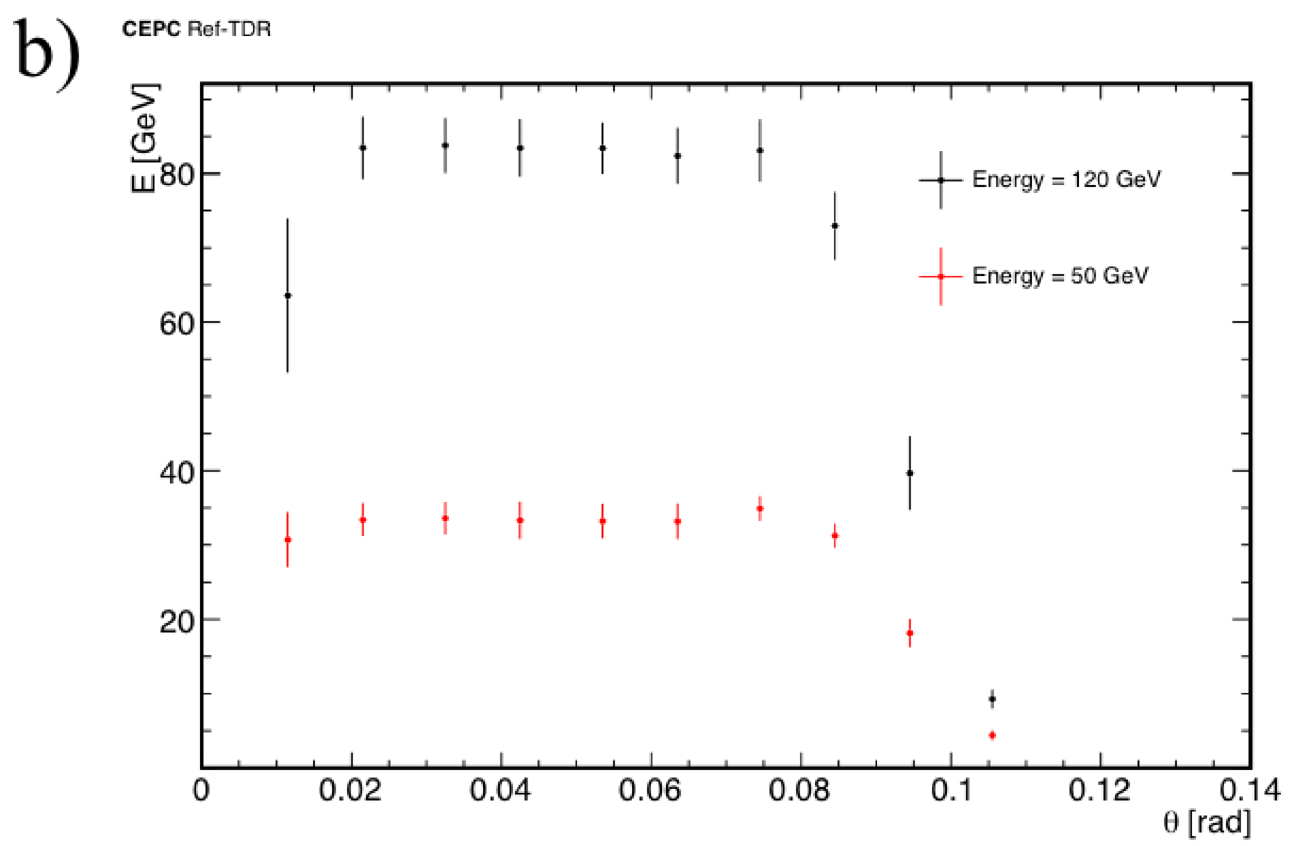


Figure 3.24: The long LYSO detector acceptance versus the electron theta is scanned along ver vertial y-axis, witht the angles illustrated in a). The sum dE/dx distributions are plotted in b) for the electron energies of 50 GeV and 120 GeV. The materials in frant include 2 X_0 short LYSO and $4.4X_0$ flange and bellow, that takes away about 40 (30) % of the shower dE/dx for 50 (120) GeVelectrons, respectively. The uniform acceptance distributed from 20 to 75 mrad.

- Labels (a), (b) should be done in Latex, if possible
- Font size on the right plot is ridiculously small. It does not follow the provided template

Chapter 3

Modified

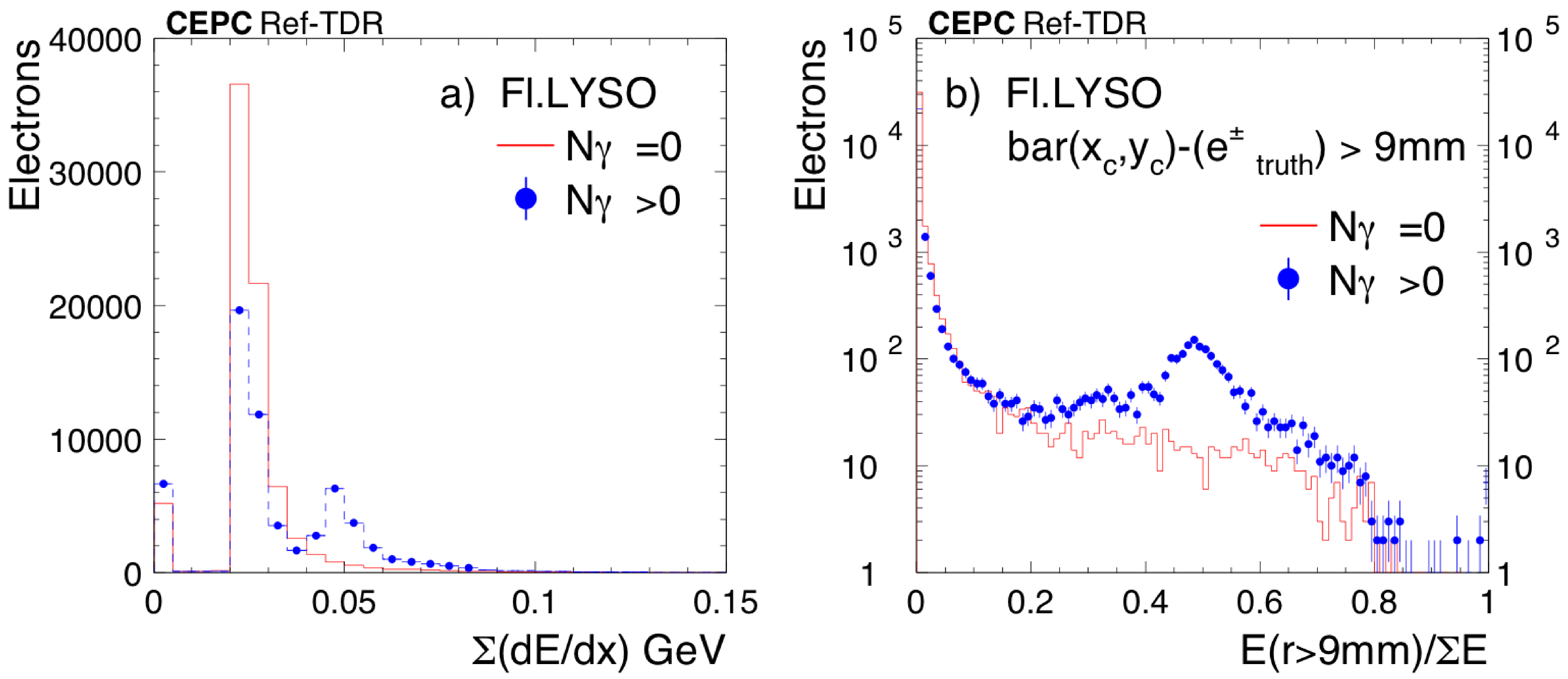


Figure 3.25: The scattered electrons of BHLUMI with projected truth directions entering LYSO at $|z| = 64.7$ mm, $|y| > 12$ mm, are simulated with GEANT. The energy deposits of electrons in a half-circle module are plotted in a). The double peak with photon could be with an FSR adjacent to the electrons. The fraction of energies in LYSO bars 9 mm off the projected electron direction is plotted in b), indicating the observable of a photon that can be identified by the LYSO bar segmentation.

- Labels (a), (b) should be done in Latex, if possible
- Text font and spacing is strange (e.g space before and after the "=" and ">" symbols should be the same. Italic should be used for variables and particle names, the same way as in the text
- What is FI?

Chapter 3

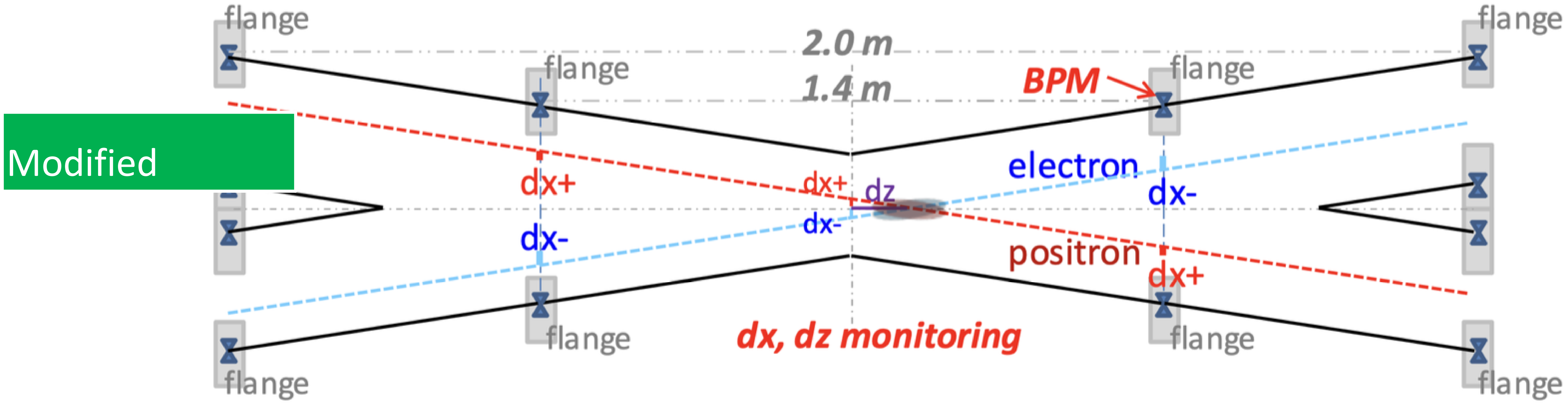


Figure 3.26: The beam currents in the interaction region are illustrated, showing the offsets to be measured with BPM.

- Text should not be written on the top of drawing elements (e.g. “flange”)
- Caption is not clear enough

Chapter 3

Modified

Not modified

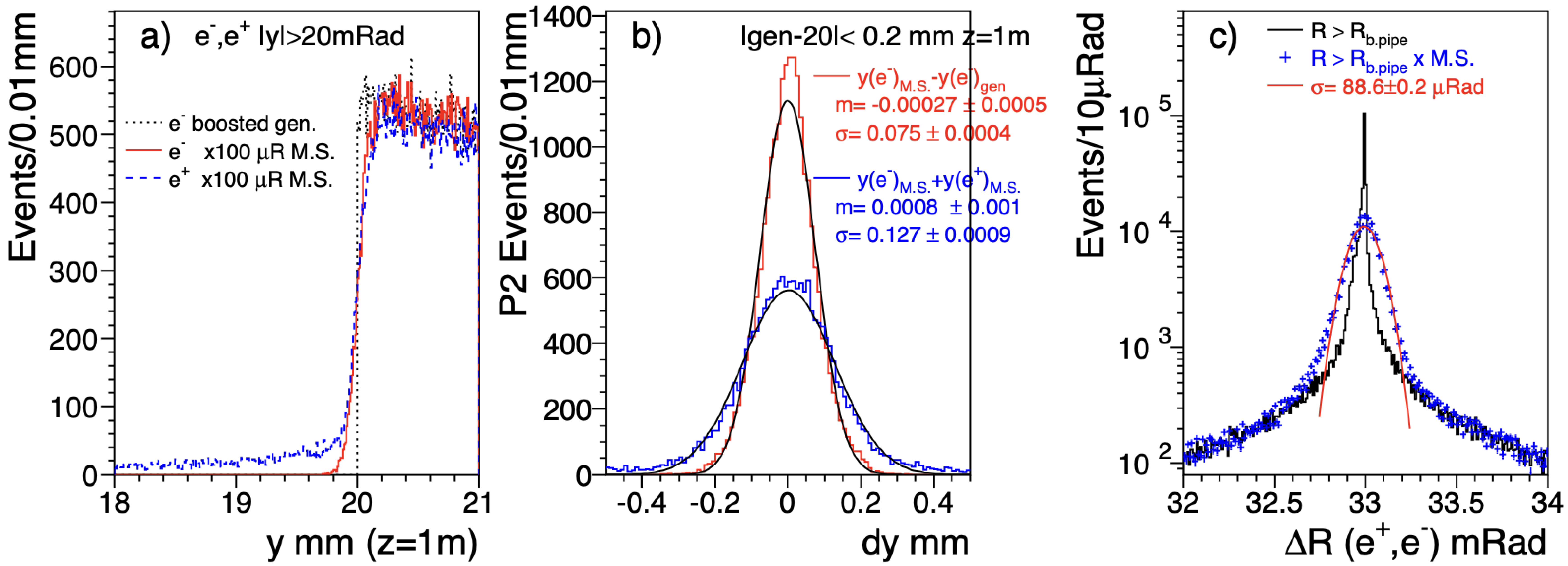


Figure 3.27: The scattered electrons (P2) and positrons (Q2) both accepted within the fiducial edges of LumiCal at $|z| = 1$ m are plotted in a) for the distribuion in $|y|$. The dotted is the BHLUMI generated P2 being cut at $|y| > 20$ mm. The multiple scattering (M.S.) smeared P2 is plotted in red solid line. The Q2 in the other z-side is plotted in blue dashed, where the tail are events having radiative photons.

- Labels (a), (b) should be done in Latex, if possible, and they should be used in the caption
- Text should stay inside the plots themselves. Not ok to have text coming out through the frame of the plot (either all inside, or all outside).
- Result of fit can be in text or table. Make sure it is really needed in this plot.
- Caption is not clear enough

Chapter 4

Modified

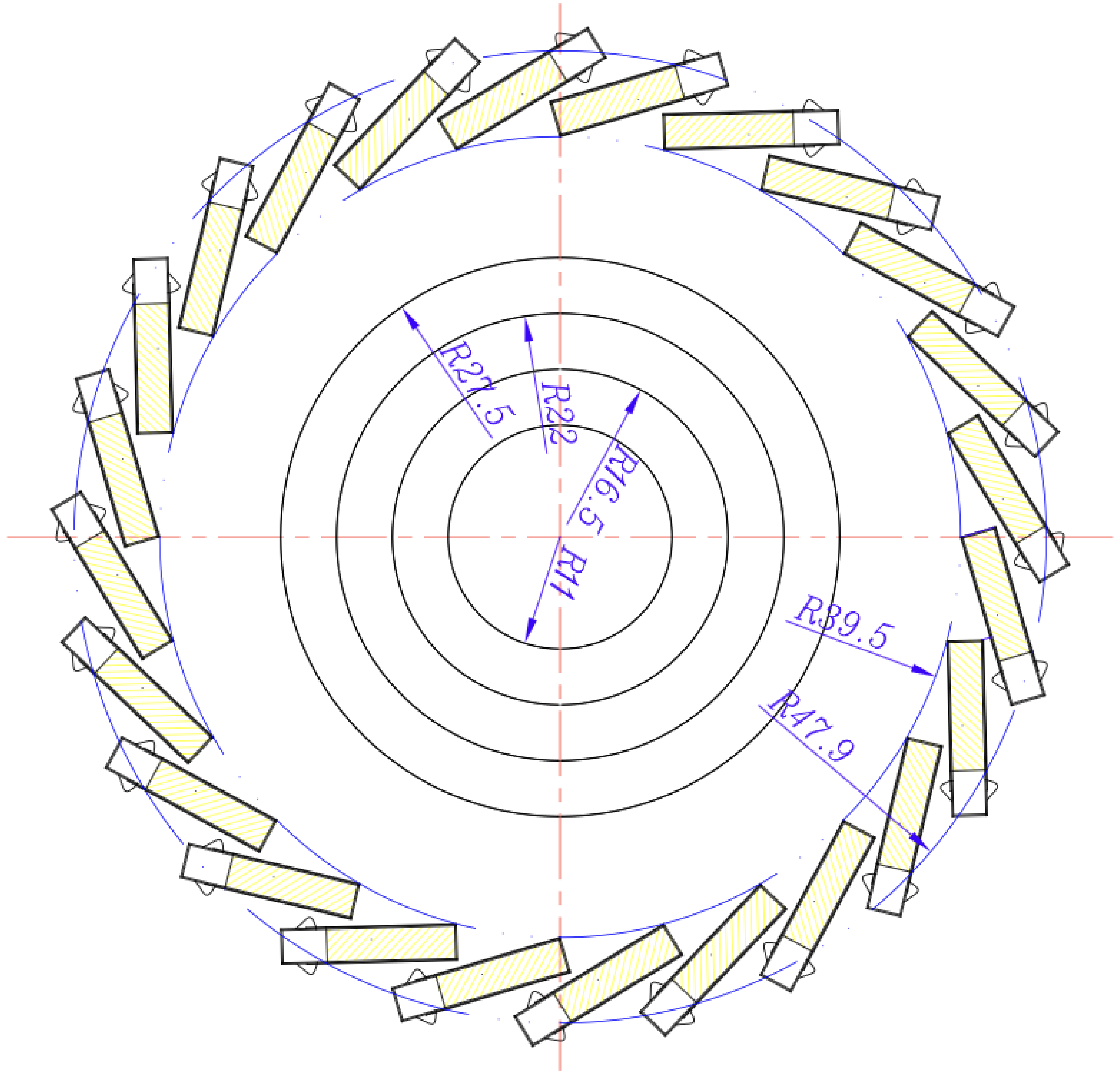


Figure 4.2: Sectional view of the VTX layout. The inner four layers are bent CIS with semi-cylindrical structure and for the 5th and 6th layers are double-layer planar CISs with ladder desgin.

- Missing units. Can just be added to the caption
- added

Chapter 4

Modified

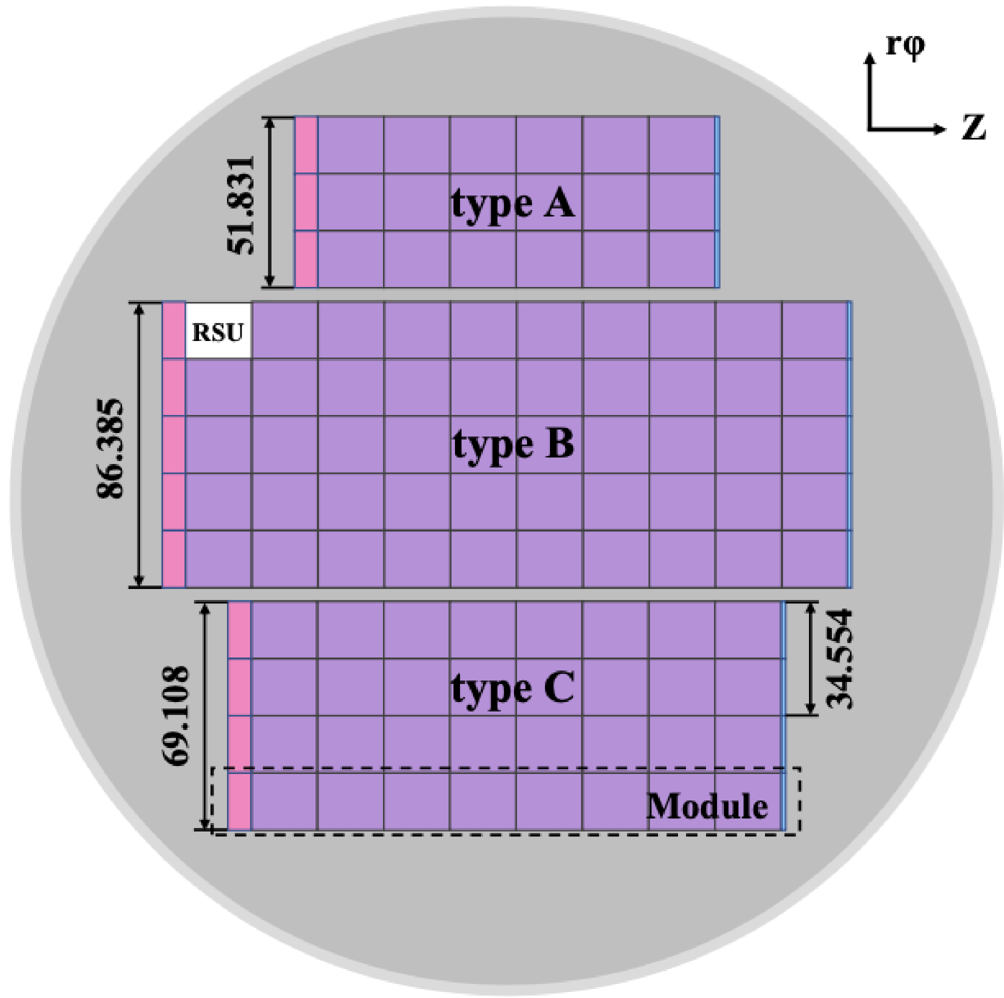


Figure 4.3: The arrangement of stitching frames on a 300 mm wafer. The purple part represents the RSUs, the pink represents the Left-end Readout Block (LRB), and the blue represents the Right-end Power Block (RPB). The short-dashed line area represents a module consisting of several RSUs, one LRB, and one RPB. To meet the requirements of each layer of the vertex detector, the type A/B/C sensors are designed with different lengths and widths. The type A and B sensors are used to make one of the sensors for CVTX 2 and CVTX 4, respectively. The full type C sensor can be used for one of the sensors for CVTX 3. The type C sensor can be divided into four modules along the vertical direction. Using two modules of the type C sensor can make a sensor for CVTX 1.

- Good, but also missing units. Units can be just added to the caption

Chapter 4

Modified

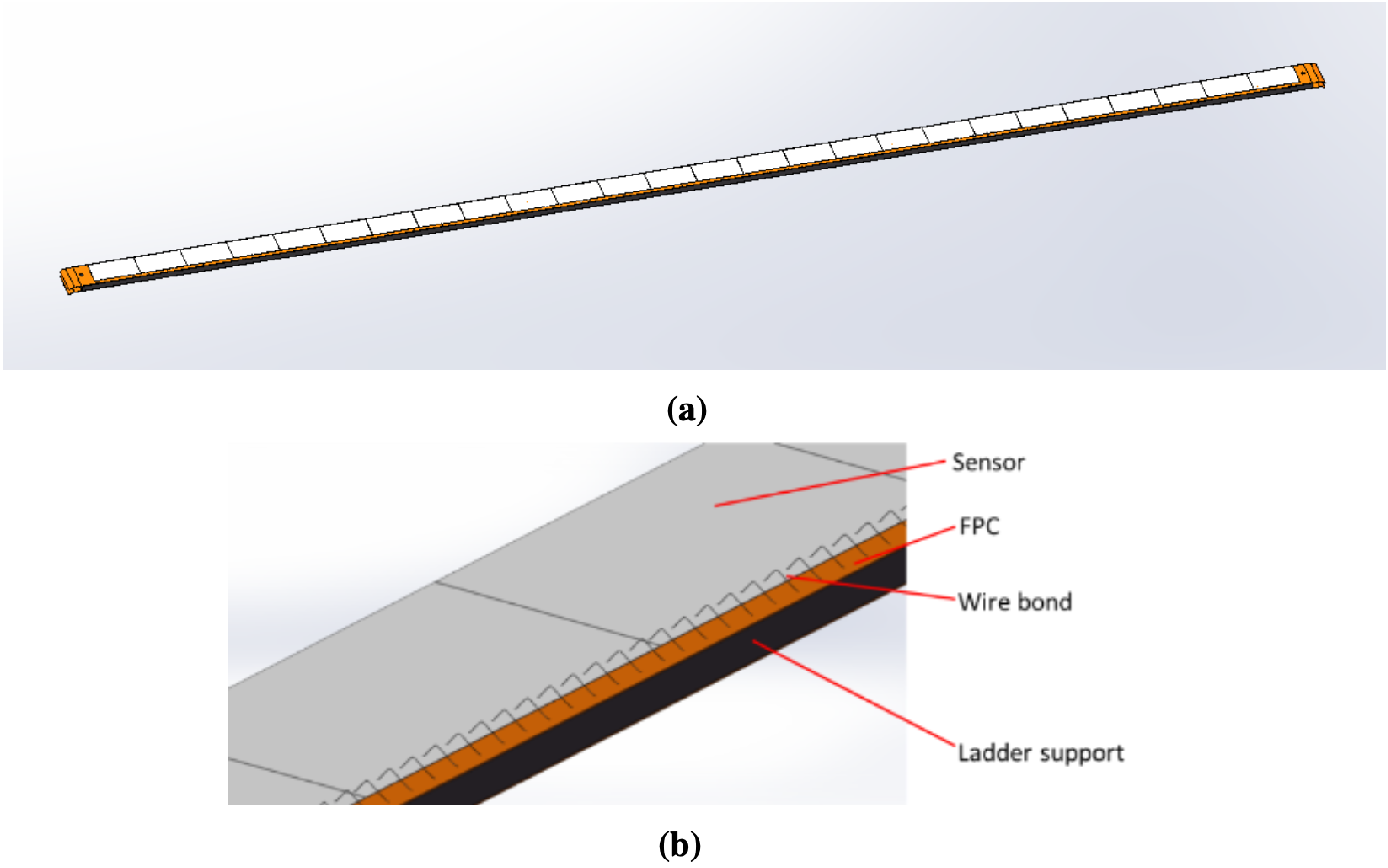


Figure 4.5: ladder structure. (a) The ladder assembly. (b) Local details of the ladder.

- Caption too short, clearly not written by the same person that wrote the captions of prior Figures.
  - These are not sentences (no verb), better to use ";" instead of "."
  - **Example caption**: A ladder is composed of 26 chips glued to an FPC mounted on a carbon fiber support: (a) the full ladder assembly; (b) ladder detail showing sensors wire bonded to FPC.
  - Modified
- Remove the grey color background from these figures. Usually figures in publications do not have this
  - grey color background to be removed by the end of July

Chapter 4

Modified

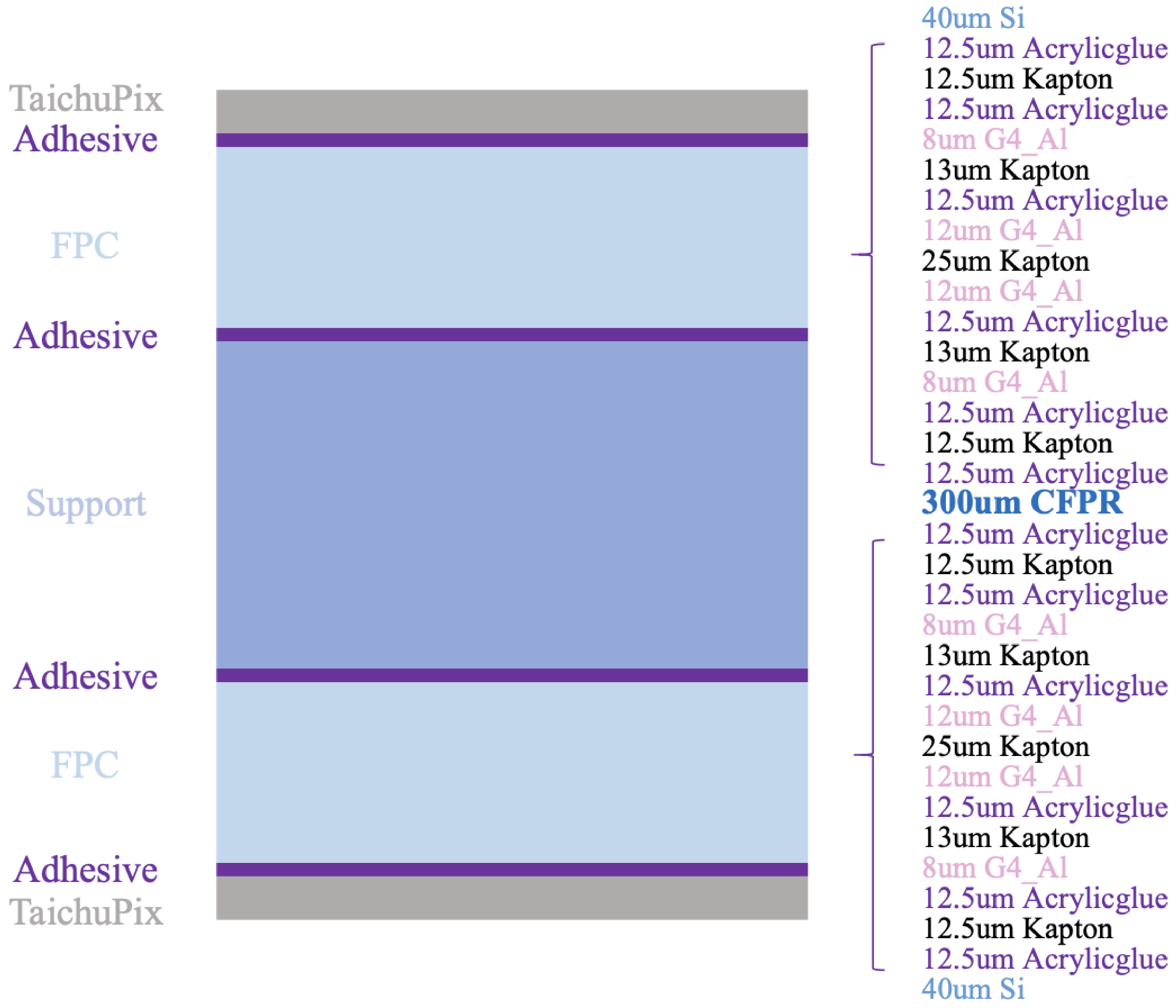


Figure 4.6: Longitudinal cross-section of a ladder, composed of two layers of chips and other materials, such as glue, carbon fiber, and aluminum. Each ladder of PVTX 5-6 in the vertex layout utilizes this structure.

- **Improved suggested caption:**
  - **Figure 4.6:** Simplified transversal cross-section of the ladder, composed of two layers of chips on the outside and other materials, such as glue, carbon fiber, and aluminum, in the bulk. Each ladder of layers 5 and 6 of the vertex detector utilizes this structure.

Chapter 4

Modified

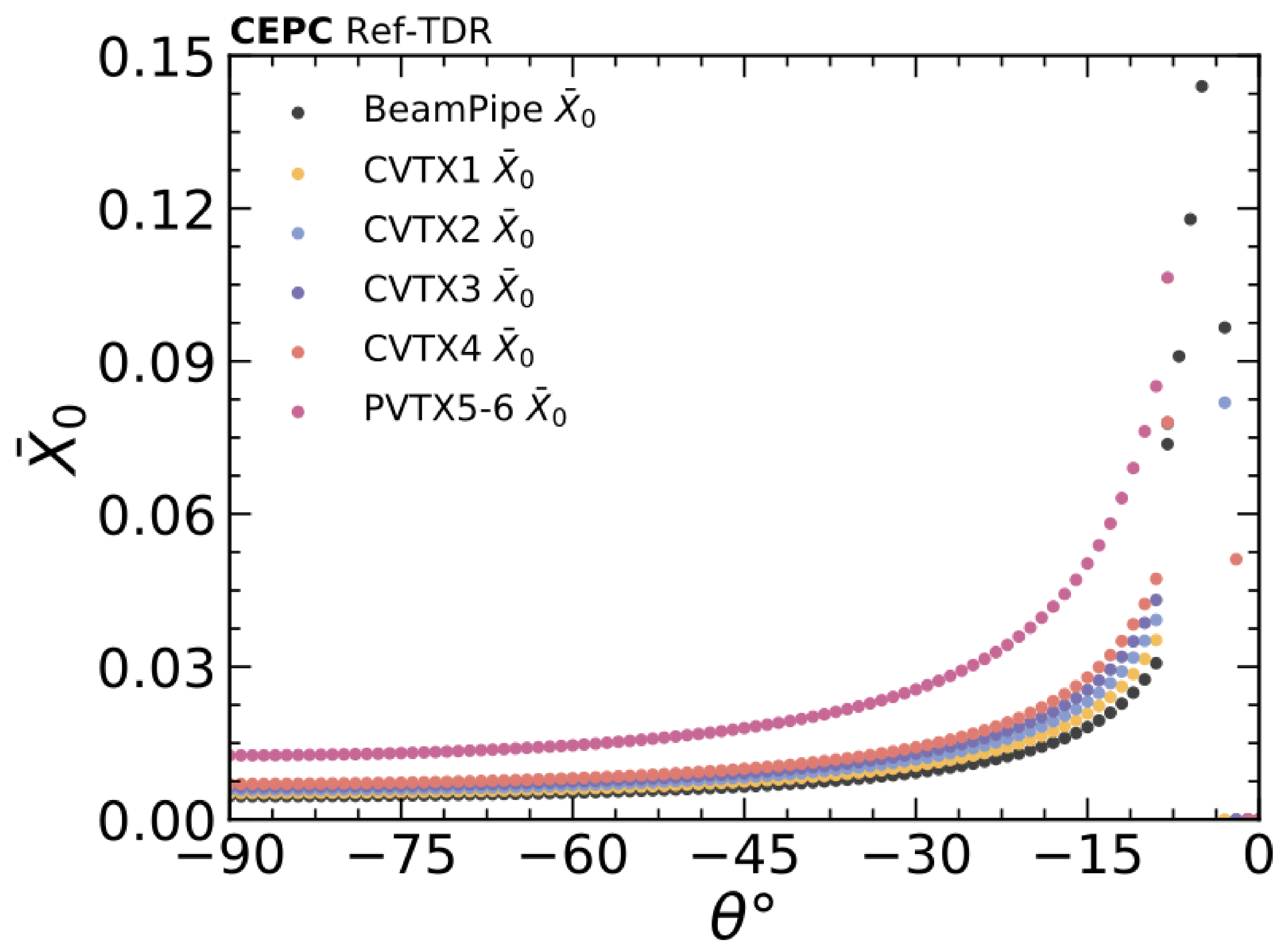


Figure 4.7: The average value $\bar{X}_0$ within the range of $\phi \in (0, 360)°$ of vertex detector varies with θ.

- Caption must have been written by a student….
  - X0 should be explicitly defined in the caption --> done
  - This is the average X0 over the full azimuthal (ϕ) range as a function of the polar angle (θ) in degrees
  - Mention why X0 increases for small θ but actually comes down for very low ones (is this physical? binning?)
    - this is due to the range of figure is not corrected. It is now fixed.
- Why polar angle θ with negative values? The symbol should not be θ°. The units should be in parentheses or brackets. (e.g. polar angle θ (deg)) --> done
- Text defines CVTX1, etc with a space CVTX 1, CVTX 2…. (added one space)
- BeamPipe should be "beam pipe", as in text done

Chapter 4

Modified

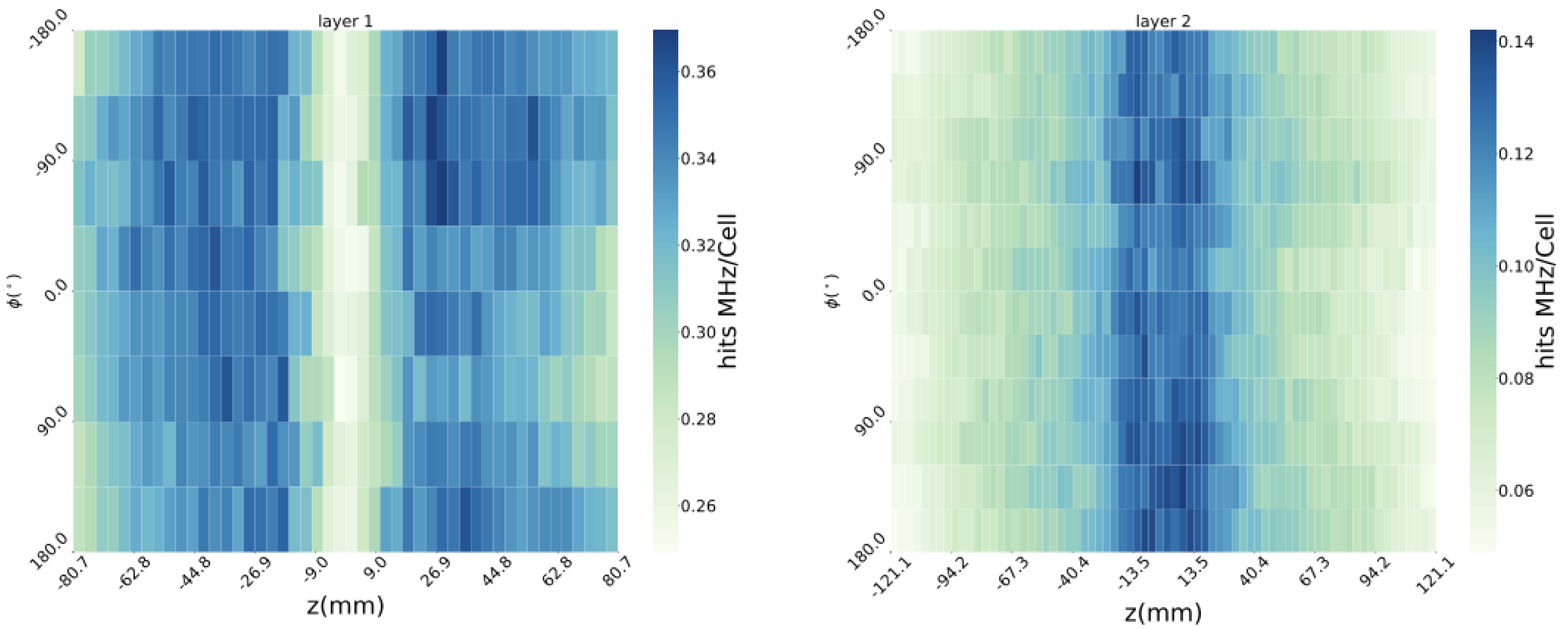


Figure 4.8: Hit rate distribution of Higgs mode. The shape of VTX is approximately cylindrical, where the x-axis can be equivalently regarded as the z-axis of the global coordinate, and the y-axis can be equivalently regarded as the polar angle ϕ of the global coordinate. Synchrotron radiation is not included.

- Missing labels (a), (b), which should be added in Latex, and explained in the caption
  - Font is too small …. very difficult to discern what is different between these two plots
  - Units of degrees should be (deg) not (º). You can use (º) after a number, but not to indicate the units in plot axis.
- Caption: text on x- and y-axis makes little sense. There is no axis in the figure. What do you really mean?
- Why is the rate a minimum at Z=0 in layer 1, and a maximum in layer 2? What is the B-field being used here?

Chapter 4

Modified

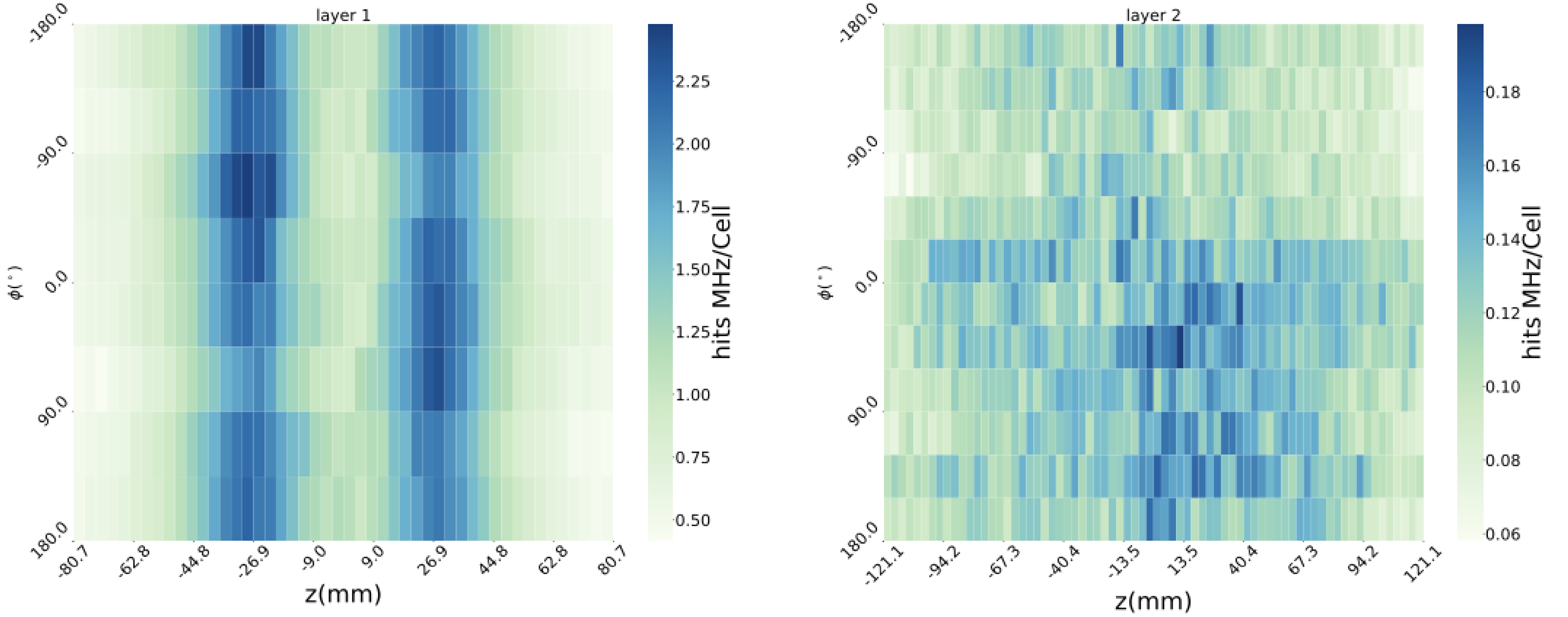


Figure 4.9: Hit rate distribution of Z mode. For we could not completely handle high-lumi Z mode now, as well as the major difference between high-lumi Z with Z mode is luminosity which means their hit rate distribution is similar, the hit rate distribution of high-lumi Z would not be shown here. Synchrotron radiation is not included.

- Same as previous plot
- Text really not clear… Just say what these plots are, not excuses for not doing other work
- added much more info now in the caption

Chapter 4

Modified

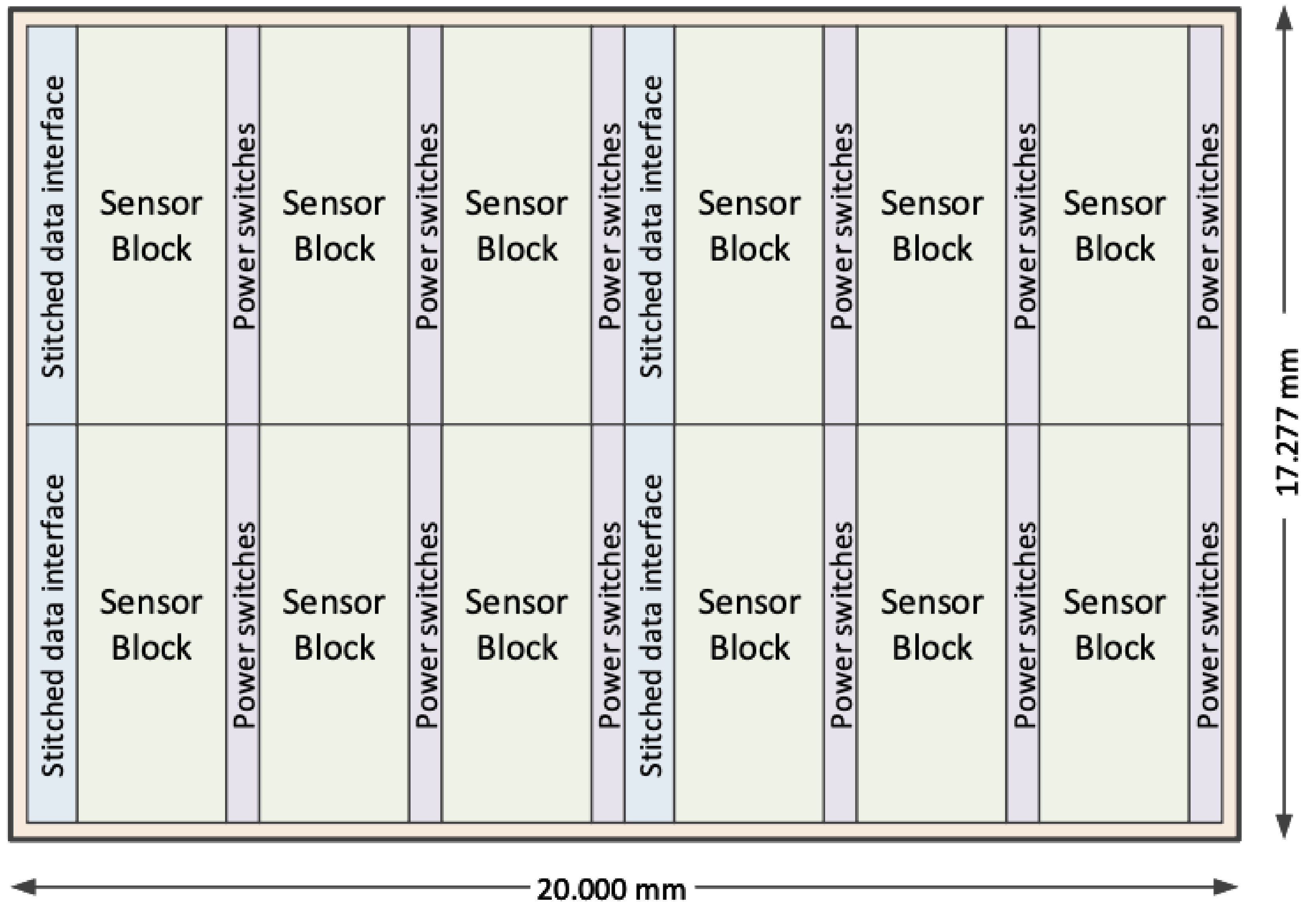


Figure 4.11: Proposed floor-plan for a RSU (not to scale). It contains several identical sensor blocks. Each of them has a pixel matrix with its own biasing generator, slow control and periphery readout circuit. Each sensor block can be selectively switched on/off. The stitched data interface blocks are used to transmit control signals and data to the edge of the stitching sensor.

- Good, but….
  - make it a little bigger so that the text can be read more easily

Chapter 4

Modified

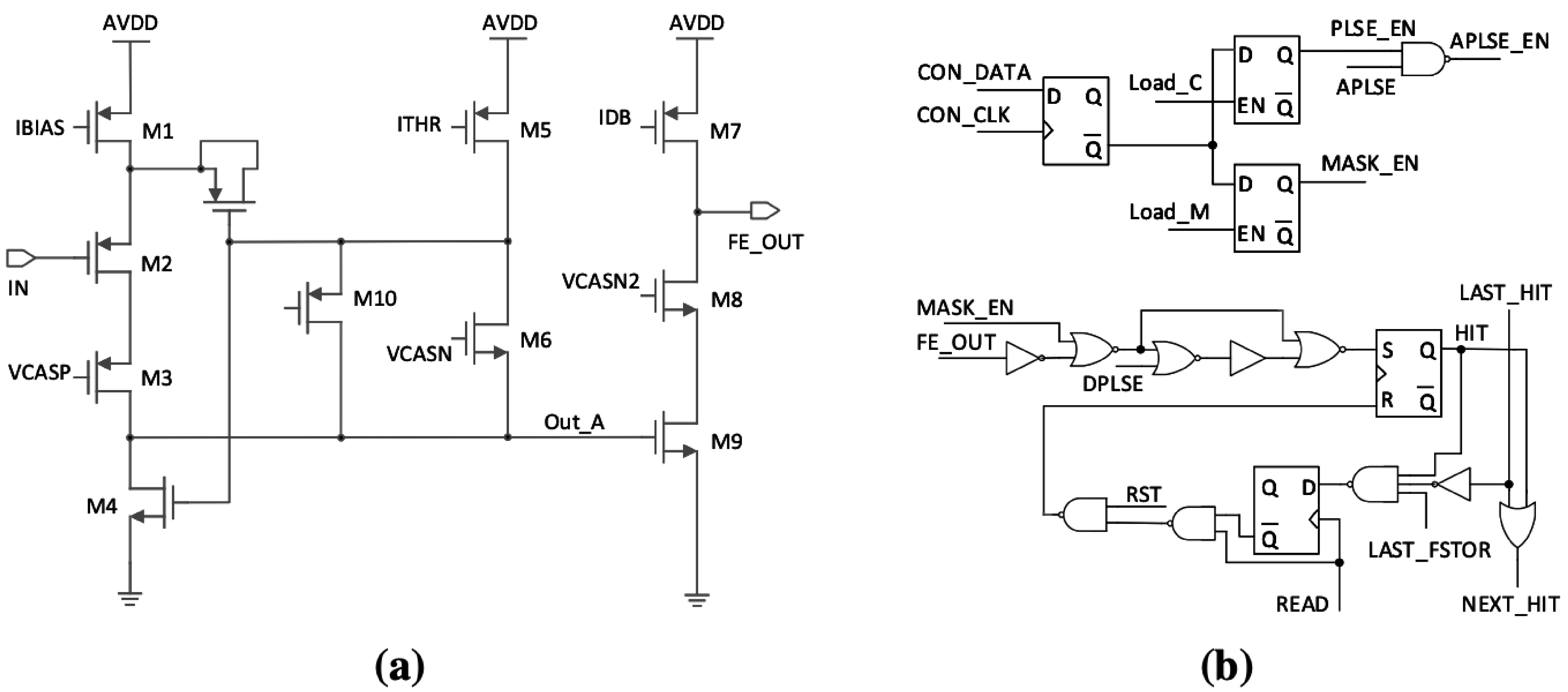


Figure 4.13: Schematic and block diagram of the in-pixel circuits. (a) Schematic of the analog front-end. (b) Diagram of the digital logic.

- Good, but….
  - Figure is not very useful without more details regarding what is being displayed because most readers are not electronics experts.
  - Caption should include the general functionality included: amplifier in analog front end, etc…
  - added more information in caption

Chapter 4

Modified

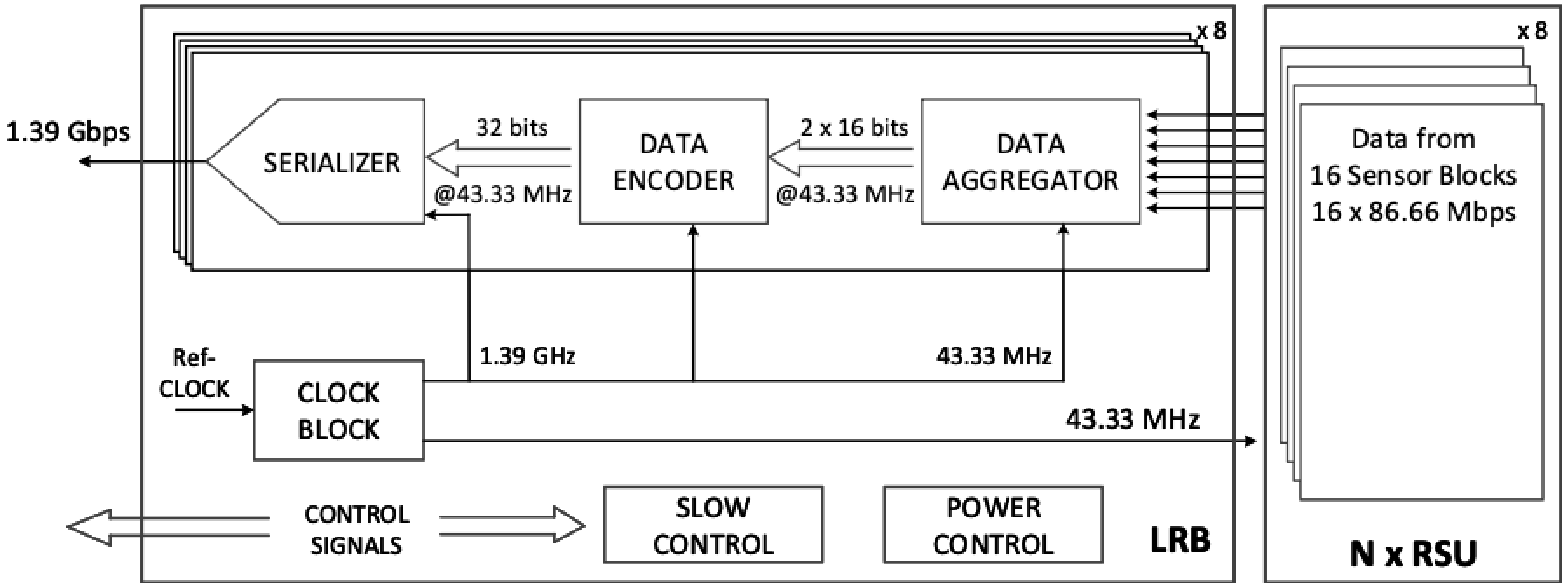
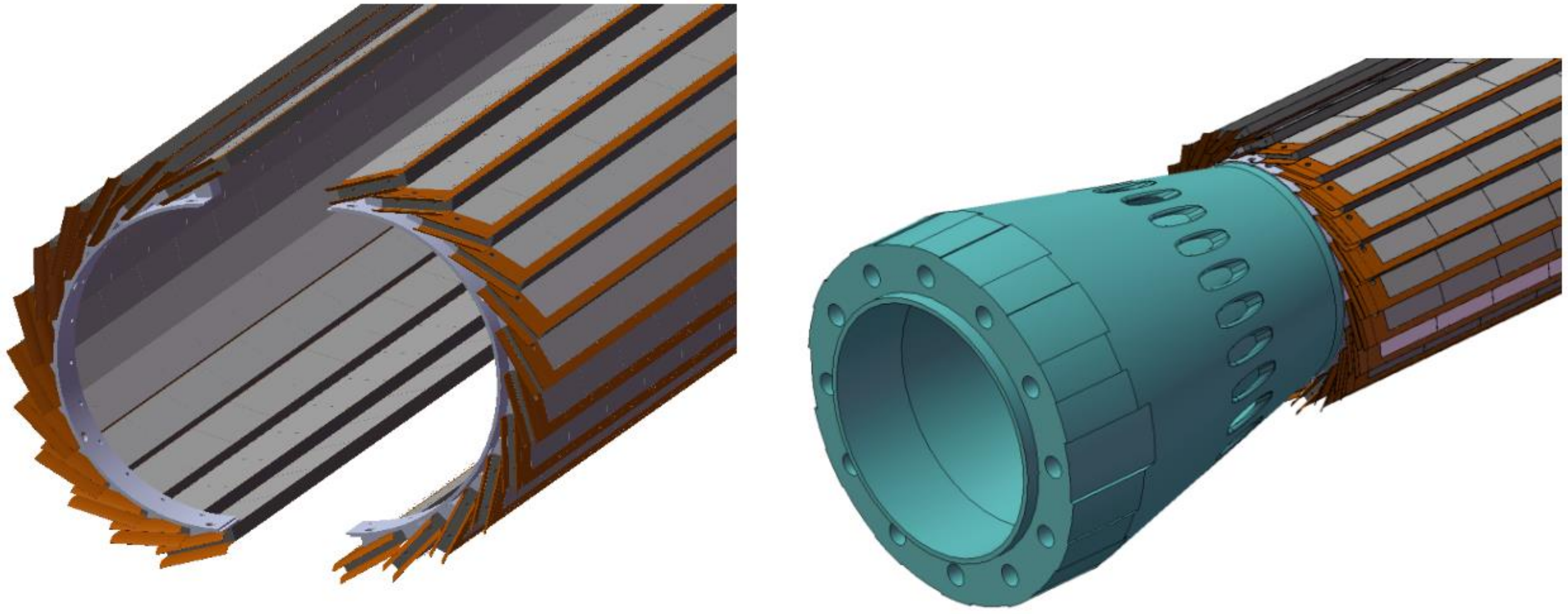


Figure 4.14: Proposed diagram of the LRB. All data from RSUs of one module has to be transmitted to the LRB. 'N × RSU' labeled in the right part of the diagram represents that different layers in the detector contain a varying number of RSUs.

- Figure is OK
- Caption needs to define LRB and RSU. People should not be forced to look for those definitions in the text

Chapter 4

Modified



(a) (b)

Figure 4.15: (a) The barrel assembly. (b) The barrel on beam pipe assembly (the outer tube of the beam pipe assembly is not shown)

- Figure (a) is not the barrel assembly, but only the two outer layers of the vertex detector, no? Note that “barrel” is jargon. There are many barrels… In this case, it could be the “barrel vertex detector” but we don’t have an end-cap, so i do see why mention barrel here.
- Figure (b) similar comment, not clear what “outer” means here since it could be either in radial direction or in z direction. I assume you mean the outer radial tube

Chapter 4

Modified

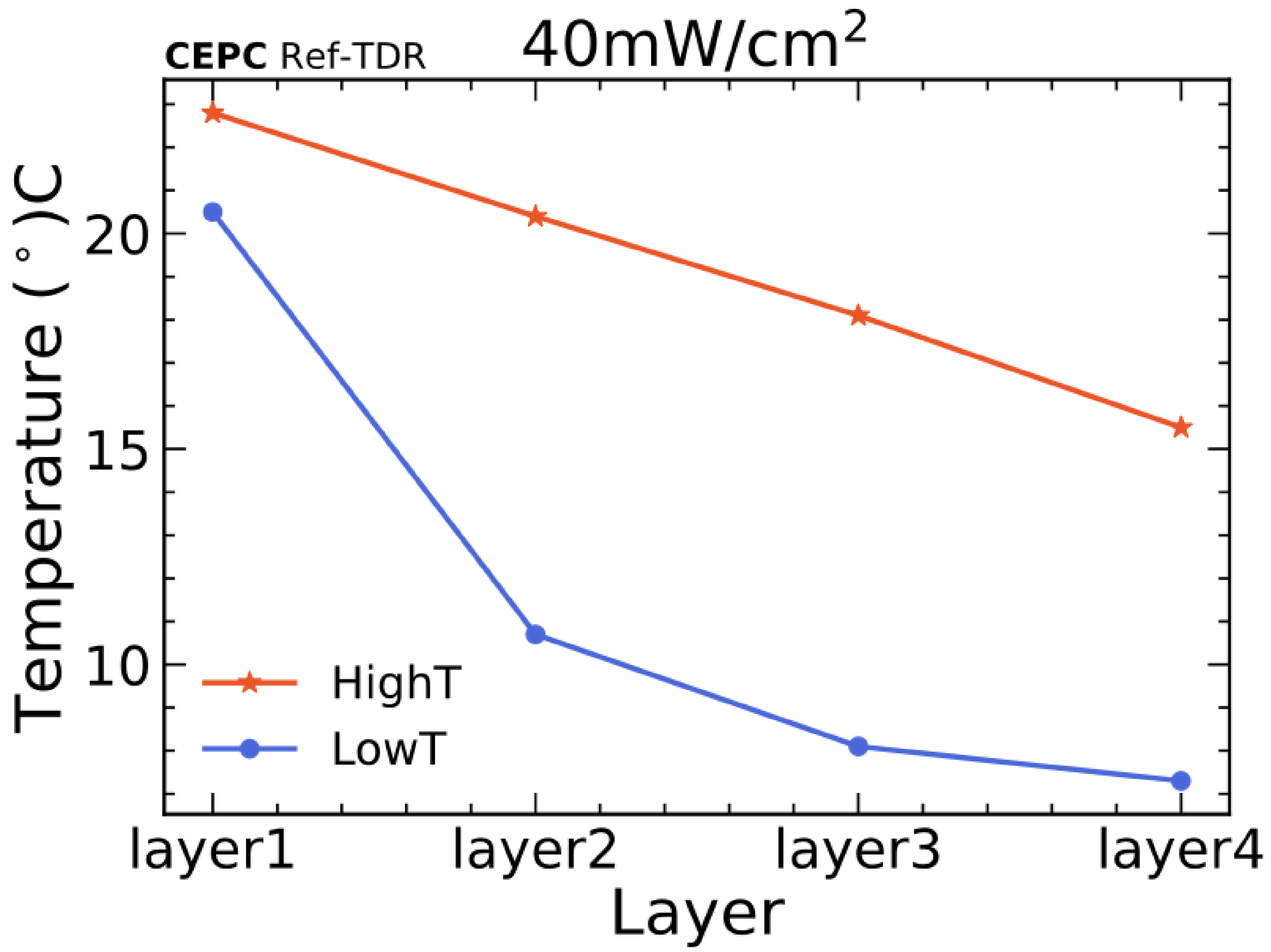
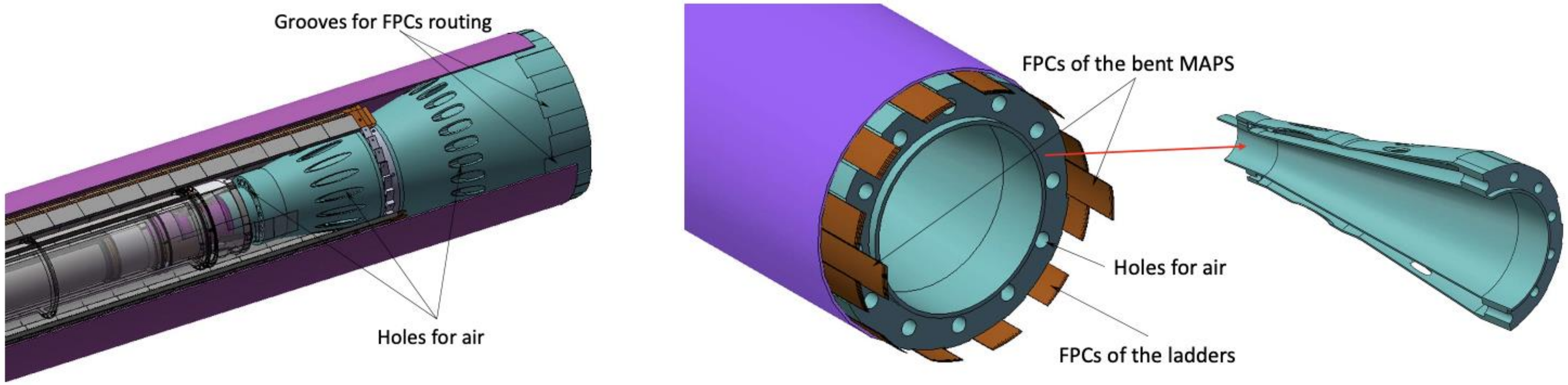


Figure 4.17: Simulation results for the cooling of bent CIS cylinders, with an airflow rate of 3.5 m/s. The beam pipe surface temperature, as shown in Chapter 3, is taken into account.

- The temperature units should be (^{o}C) not as displayed
- HighT and LowT should be High temperature and Low temperature, or add a space before T (do not use new unnecessary symbols)
  - What is the definition of HighT and LowT?
  - What is the significance of 40mW/cm^2? It is not mentioned in the caption
- Caption:
  - "Simulation results for the cooling" could meaning many things. The plot shows a temperature measurement somewhere, where?

Chapter 4

Modified



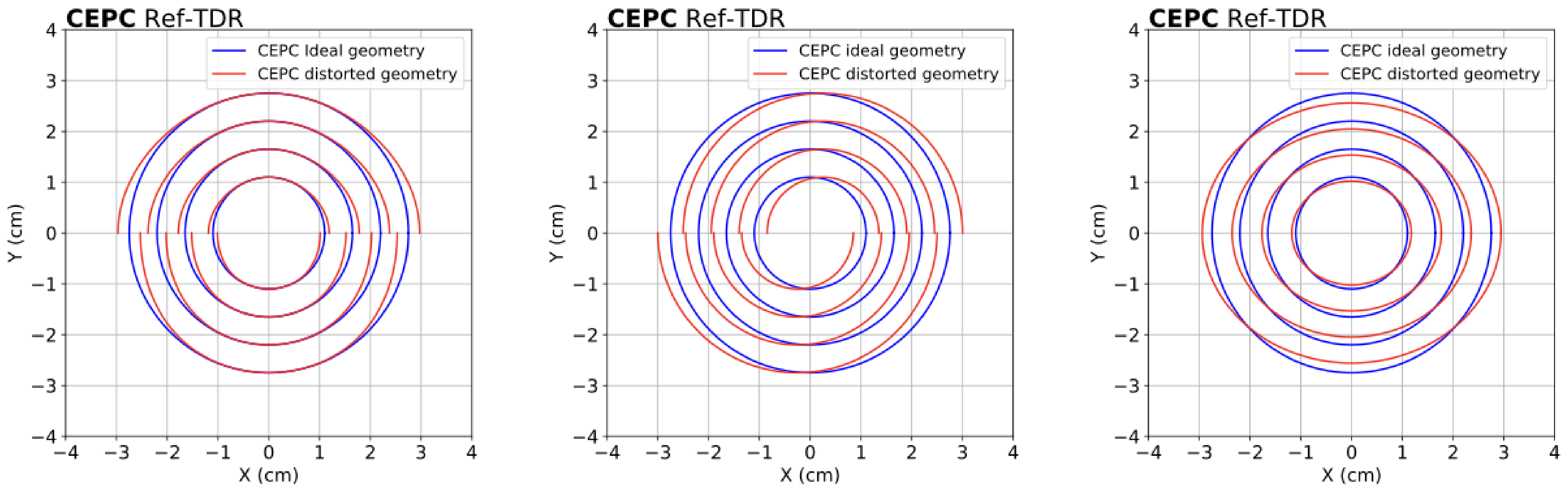
(a) (b)

Figure 4.18: Air ventilation and cable routing of the VTX. (a)Air channel design with holes on global support structure for air distribution. Grooves on support structure is designed for FPCs routing. (b) The FPCs of the vertex detector routed out of the side of the beam pipe assembly, along with a cut view of the conical part.

- This figure was shown last week.
  - We fixed what i pointed out, the capitalization of “The FPCs…” but forgot to add a space after (a) and before “Air”
- **Please be proactive looking for problems. I cannot write everything**

Chapter 4

Modified



(a) (b) (c)

Figure 4.19: Illustration of the hit positions in the transverse plane with ideal vertex geometry and three deformed geometry. The amount of deformation is amplified with respect to the expected one for visualisation. (a) Elliptical deformation. The red distorted geometry is elongated horizontally, demonstrating a deformation primarily along the x-axis. (b) Illustration of the hit positions in the transverse plane for vertex geometry exhibiting irregular, wavy distortion. The distorted geometry has noticeable undulations, indicating non-uniform deformation affecting both the x and y directions unevenly. (c) Illustration of the hit positions in the transverse plane for vertex geometry showing a circular distortion with uniform radial expansion. The distorted geometry presents a uniformly increased radius, representing an isotropic deformation compared to the ideal geometry.

- Font is still too small !
  - There is space to make the plots bigger and/or increase the font size

Chapter 4

Modified

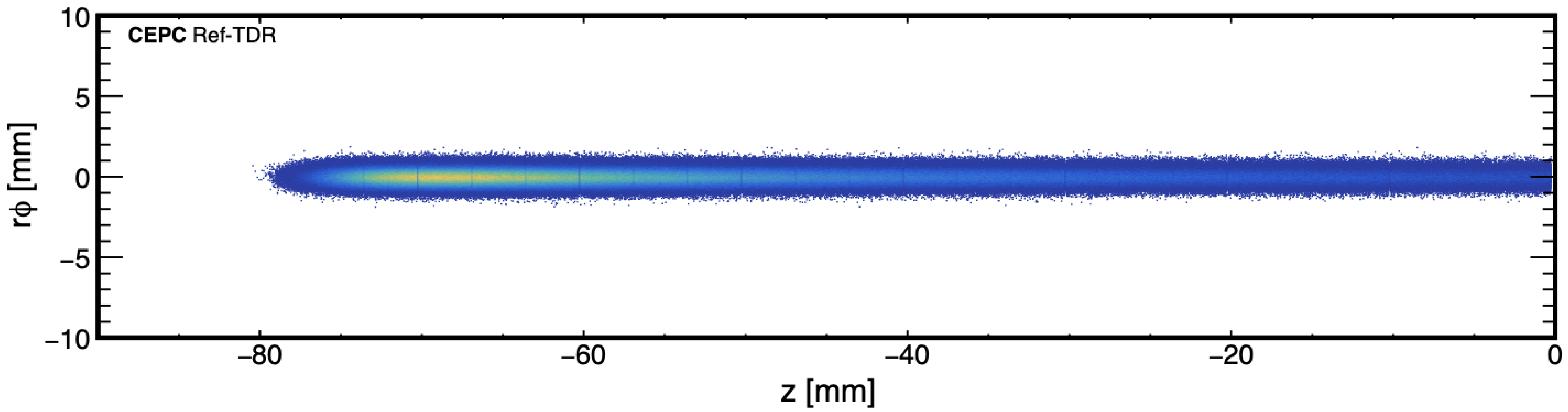


Figure 4.21: The laser beam spot on the second layer from (13 mm, 0, -85 mm) in cylindrical coordinate system, where the horizontal axis is the *z*-coordinate, and the vertical axis is the $r\phi$ coordinate. And each region is divided by a blank or lower rate than its neighbor means one sensor.

- CEPC Ref-TDR font is still too small. Are we ashamed of it? :-)
- Caption:
  - “Laser beam spot…” drop the “The”
  - Don’t start sentences with “And” (I cannot understand this sentence either)

Chapter 4

Modified

Not modified

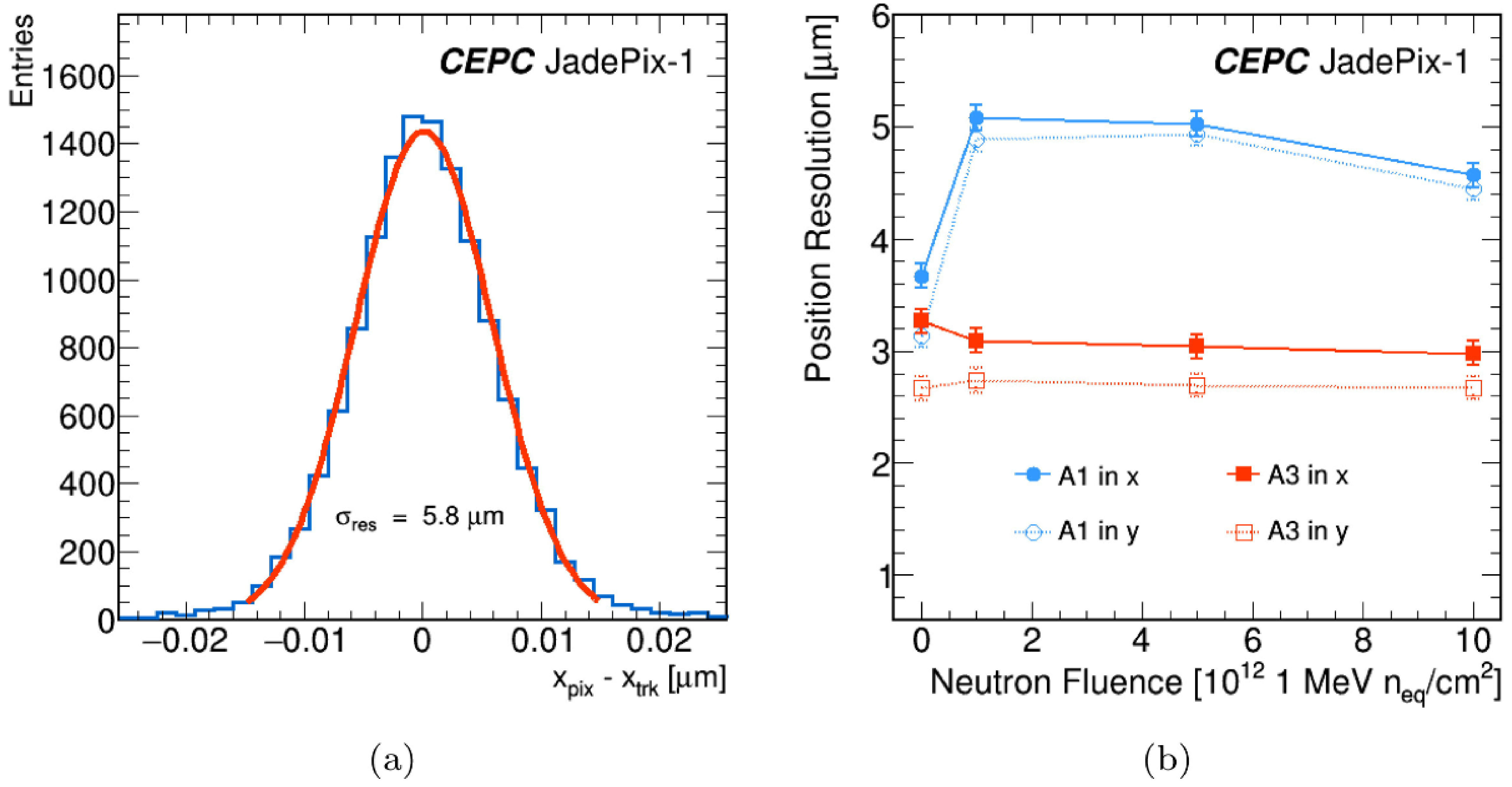
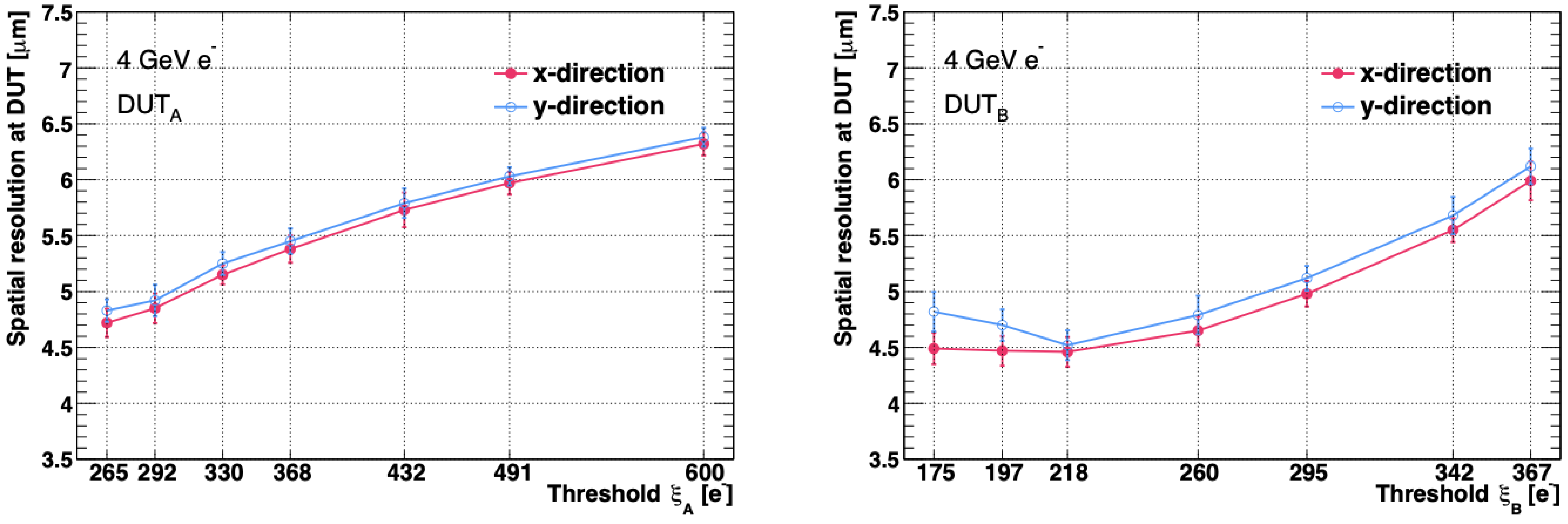


Figure 4.22: (a) Residual distribution of JadePix-1 sensor in the x direction. (b) Position resolution for sensors with a small electrode (A1) and a large electrode (A3) before and after the neutron irradiation.

- Caption:
  - "x" should be italic (like in the previous Figure)
  - Why is the resolution in the x-direction worse than in the y-direction?
  - A1 and A3 are not defined in the text, and here the regard small and large electrodes. Make the connection either in the caption or in the text.

Chapter 4

Modified



(a) (b)

Figure 4.23: Spatial resolution as a function of threshold for DUT_A(a) and DUT_B(b) in the x-direction and y-direction. The error bars represent the total systematic uncertainty.

- x-, y-direction are not defined. Also not defined in the text, as far as i can see, although they are different in the results
  - Usually resolution in the x direction would be indicated with σ_x, etc..
- What is the difference between DUTA and DUTB?
- Missing CEPC labels

Chapter 4

Modified

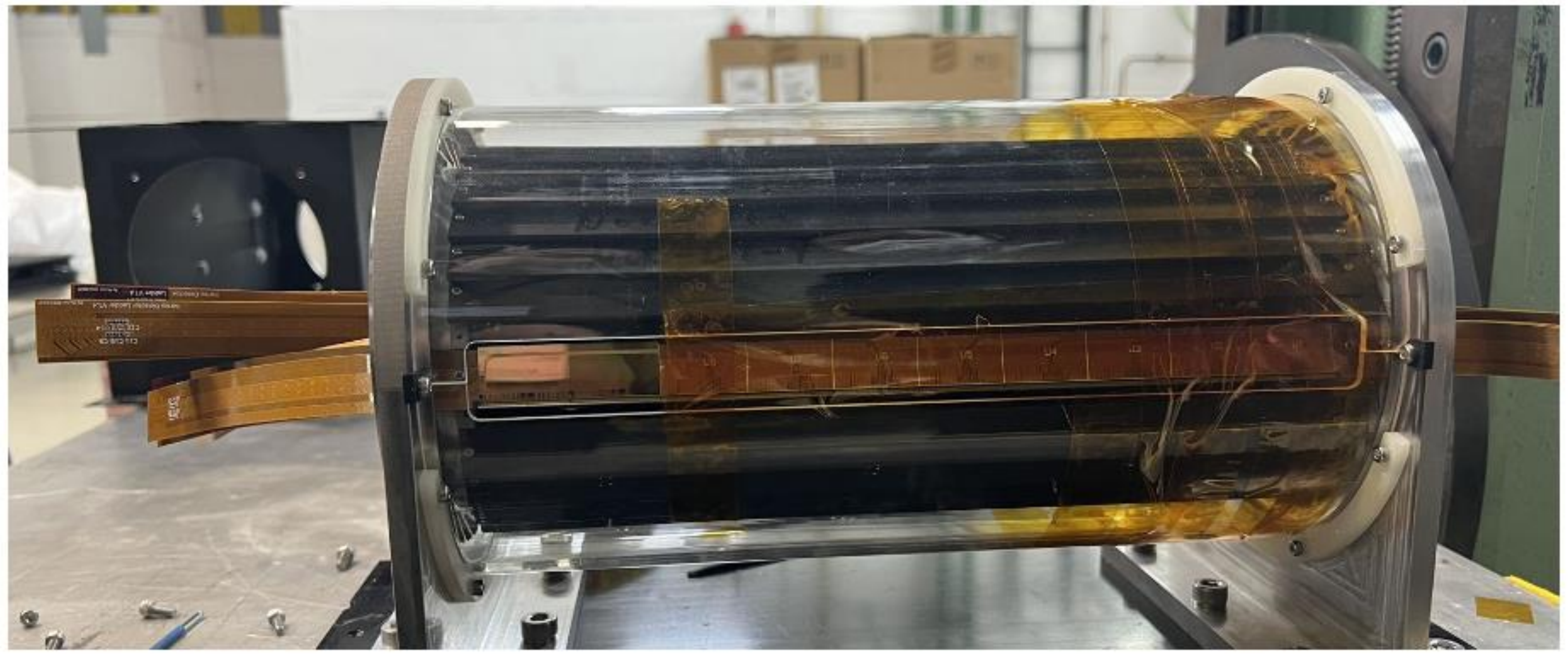


Figure 4.24: Planar vertex detector prototype with six ladders mounted for beam test.

- Caption does not explain what we are seeing? No way for the reader to know what 6 ladders were mounted.
  - First, the prototype had all mechanical ladders mounted
  - I assume you mean there are "6 instrumented ladders". Somewhere in the text, we should say that each ladder had one Taichupix, and the beam was shot through the 6 ladders providing 12 measurement points
  - modified as suggested.

Chapter 4

Modified

Stitching/StitFig4.jpg

(a)

Stitching/StitFig5.jpg

(b)

Figure 4.25: Prototype for bending test. (a) Testing of bending limit, the minimum bending radius of 12 mm has achieved. (b) Determining the damage-free duration of the bending wafer, this prototype placed for over 2 years without damage.

- Figure missing
- added

Chapter 4

Modified

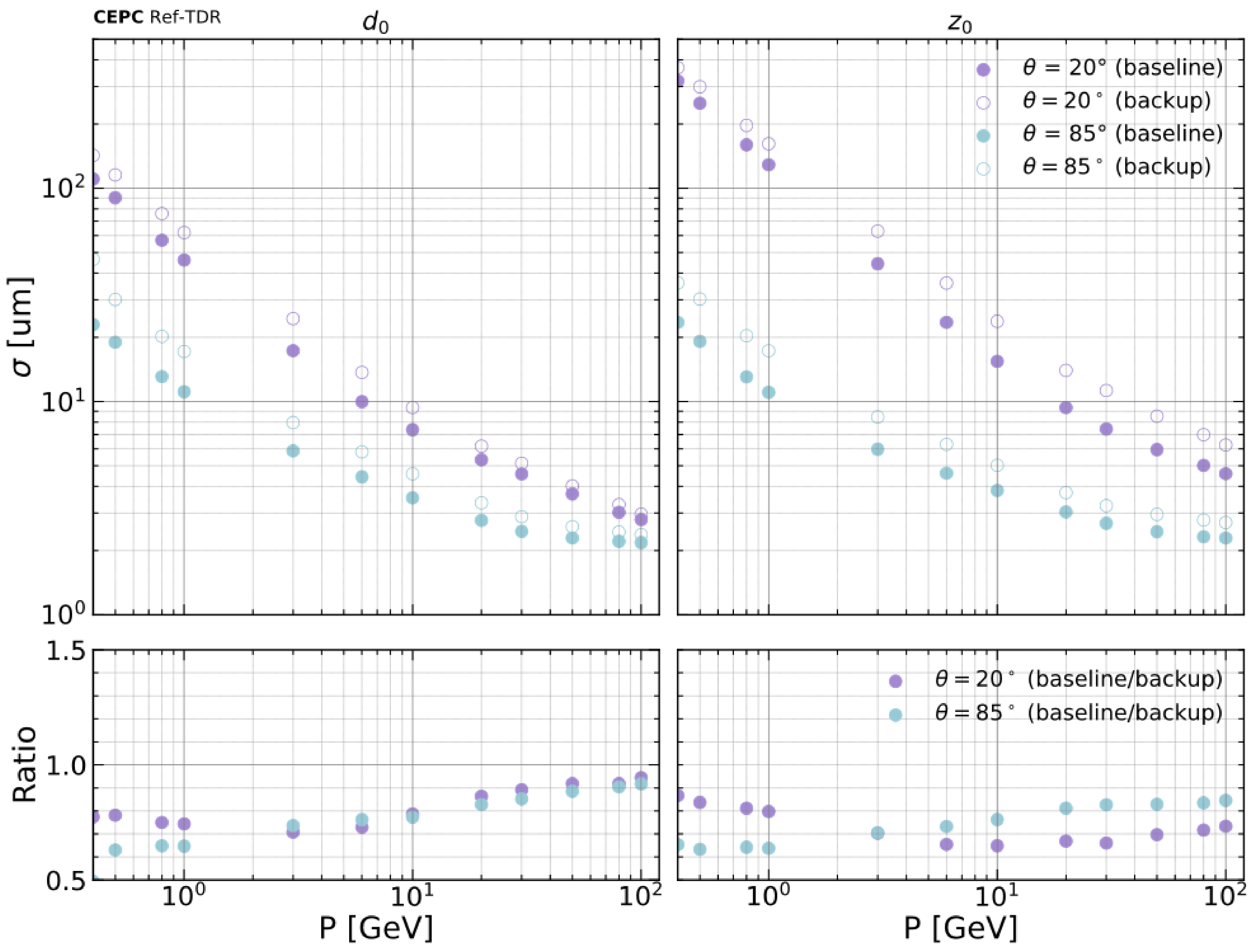


Figure 4.27: The resolution of the impact parameter d_0 and z_0 in the two schemes varies with the change in the momentum of the outgoing μ^- particles.

- Caption: this observation in the caption is obvious and irrelevant to this plot. We can conclude something relative to the comparison, but most important is to say what exactly is this plot (how it was obtained).
- This is for MC muon particles transversing the detector at two different angles, showing that the baseline detector has 10-40% better resolution than the backup solution
- It would be better to call the detectors by proper names, instead of baseline and backup, for instance “curved vtx” and “planar vtx”
- The font for CEPC Ref-TDR is too small

Chapter 4

Modified

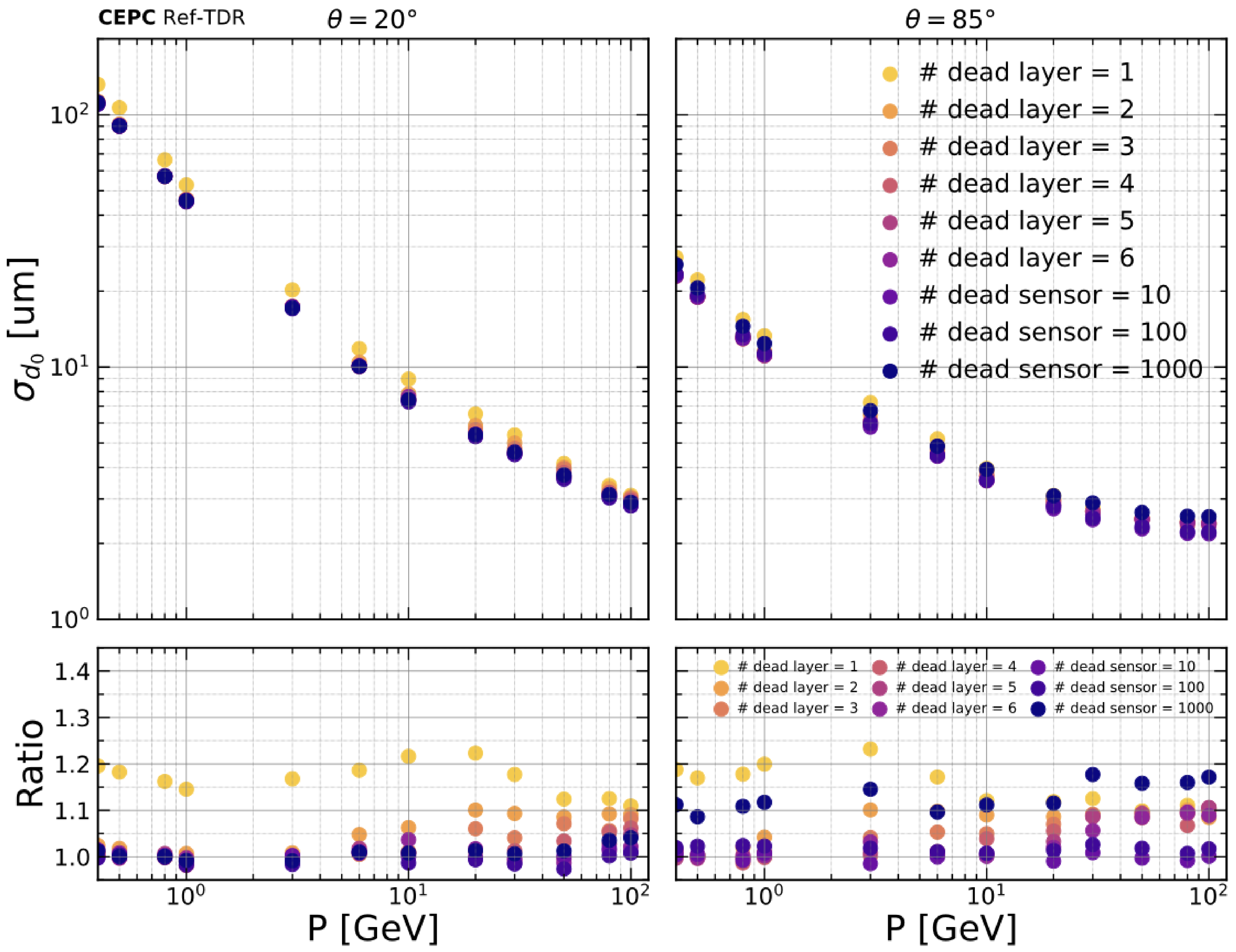


Figure 4.28: Resolution of the impact parameter d_0 for tracks obtained by the baseline vertex detector under different dead layer/sensor conditions, including complete layer failures and 10, 100, 1000 sensor failures (RSUs in CVTX, Taichu chips in PVTX), with ratios to the baseline scheme.

- No need for two legends in this plot. Should delete the one in the ratio plot, which is not readable anyway
- The font for CEPC Ref-TDR is too small
- modified the figure as suggested

Chapter 4

Modified

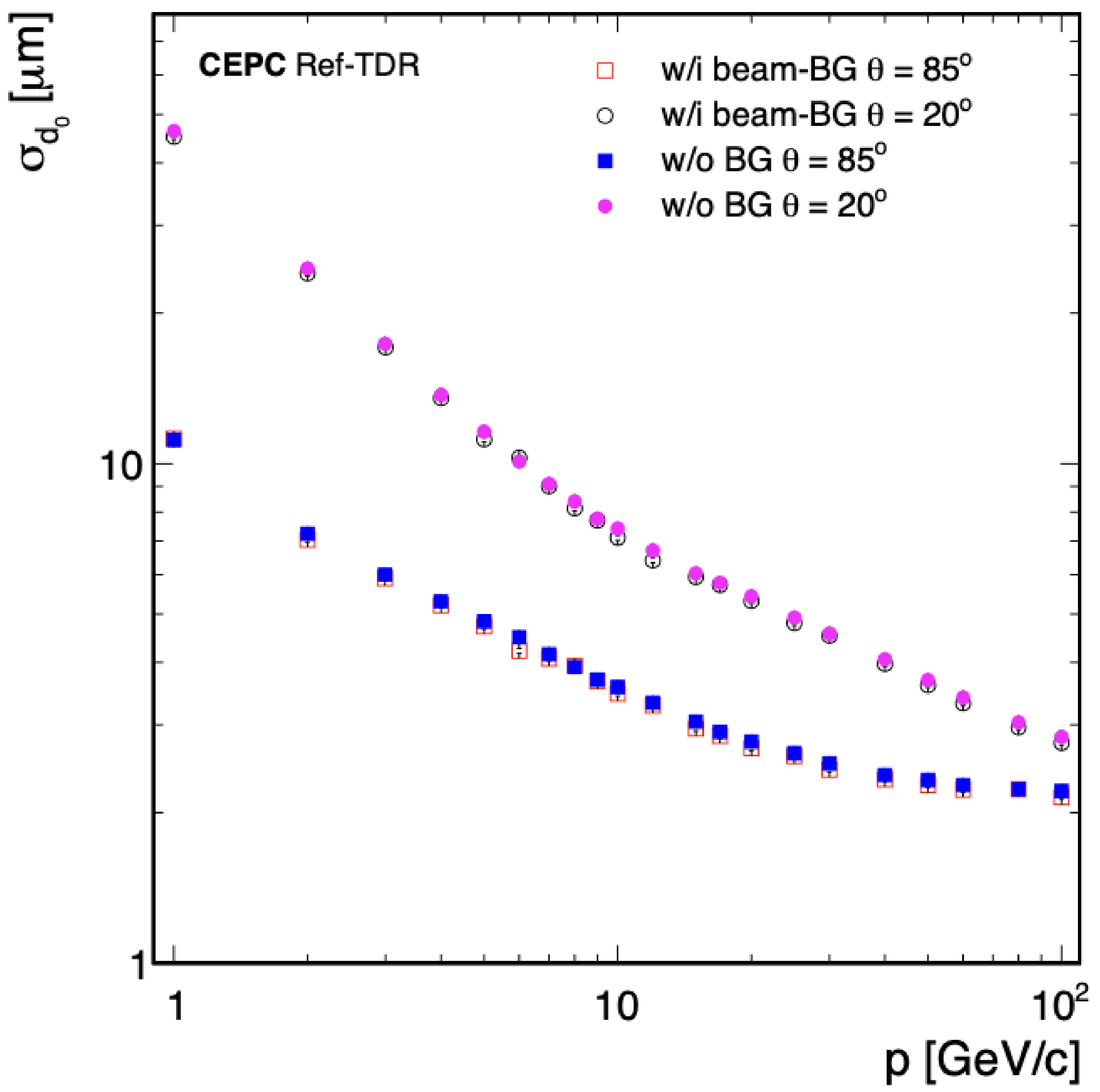


Figure 4.29: Comparison of resolution of the impact parameter d_0 of tracks between clean single muon signal (w/o BG) and mixing beam background (w/i beam-BG) at polar angle of 85° and 20°.

- Make fonts bigger. There is plenty of space, the plot looks empty
- Should use same style as Fig. 4.28 with a grid. Should not have two styles one after the other.
- w/i should be “with” , w/o should be “without”. Don’t invent abbreviations… w/i means Walk-In, not with…. With should be w/ but better not to use
- re-make the figure

Chapter 4

Modified

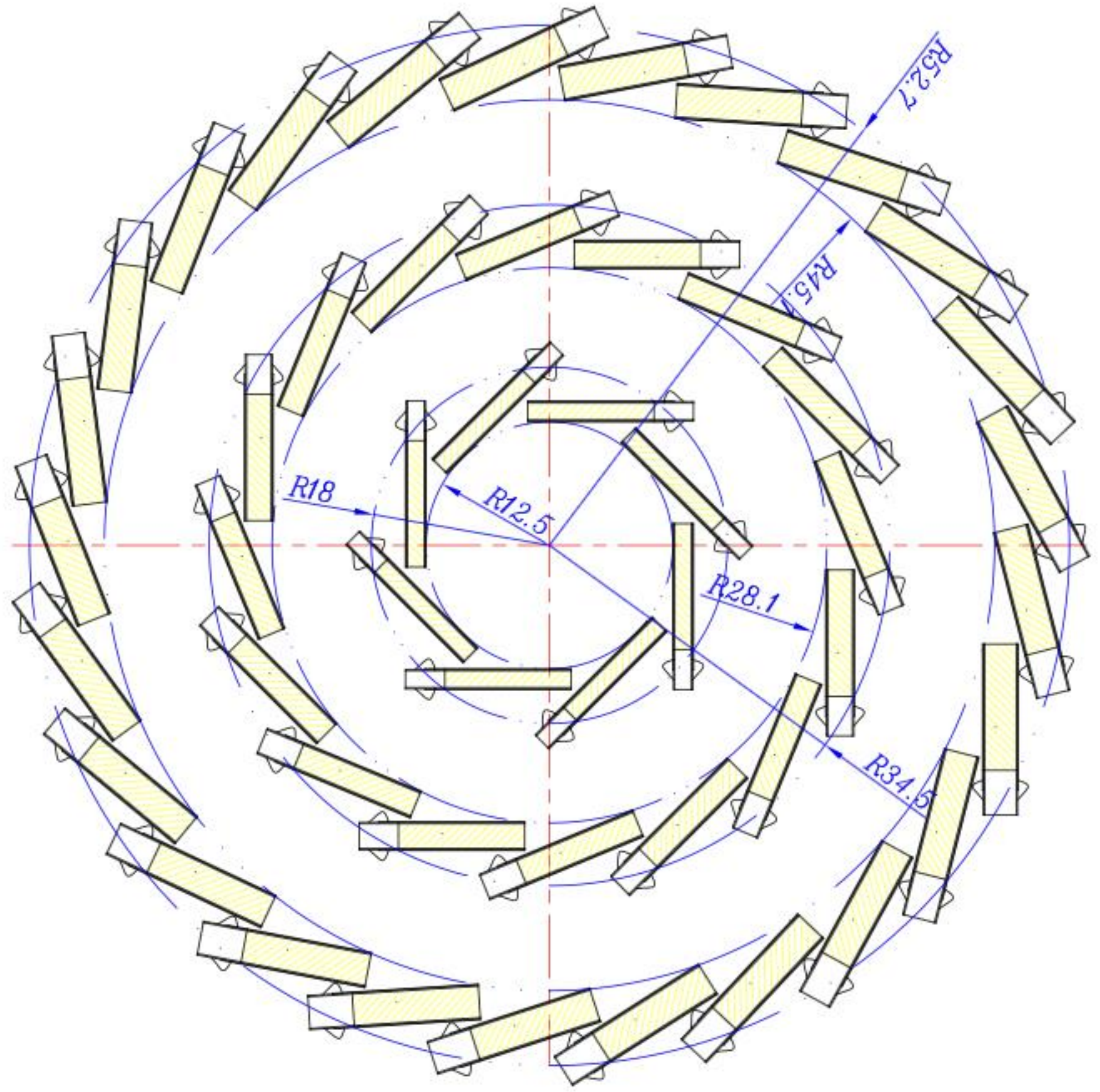


Figure 4.30: Sectional view of the VTX backup layout. All the 6 layers (3 layers of double sided ladders) are composed of planar CISs. PVTX 1-2, PVTX 3-4, and PVTX 5-6 include 8, 16, and 25 ladders, respectively.

- Units missing
- Call the vertex alternative, instead of backup
- Small numbers (less than 10) are usually spelled so, six instead of 6, three instead of 3.

Chapter 5

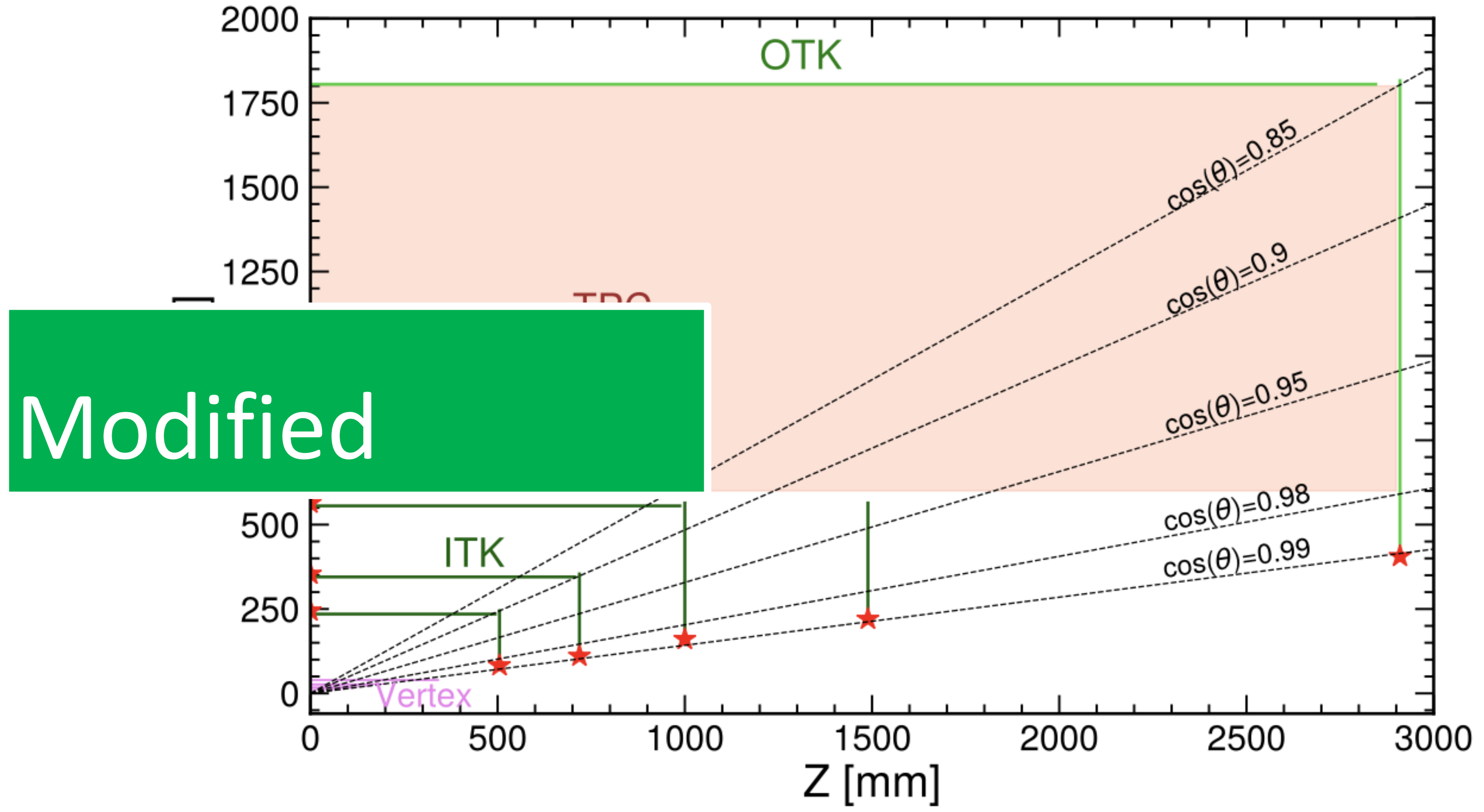


Figure 5.1: The layout of the CEPC tracker system. The tracker system comprises the Vertex Detector, the Inner Silicon Tracker (ITK), the Time Projection Chamber (TPC), and the Outer Silicon Tracker (OTK). The ITK consists of three barrel layers and four endcap layers. The OTK, as the outermost component of the tracker system, features one barrel layer and one endcap layer, providing both high-precision spatial and timing measurements. Action: To remove as it is already in Chapter 2

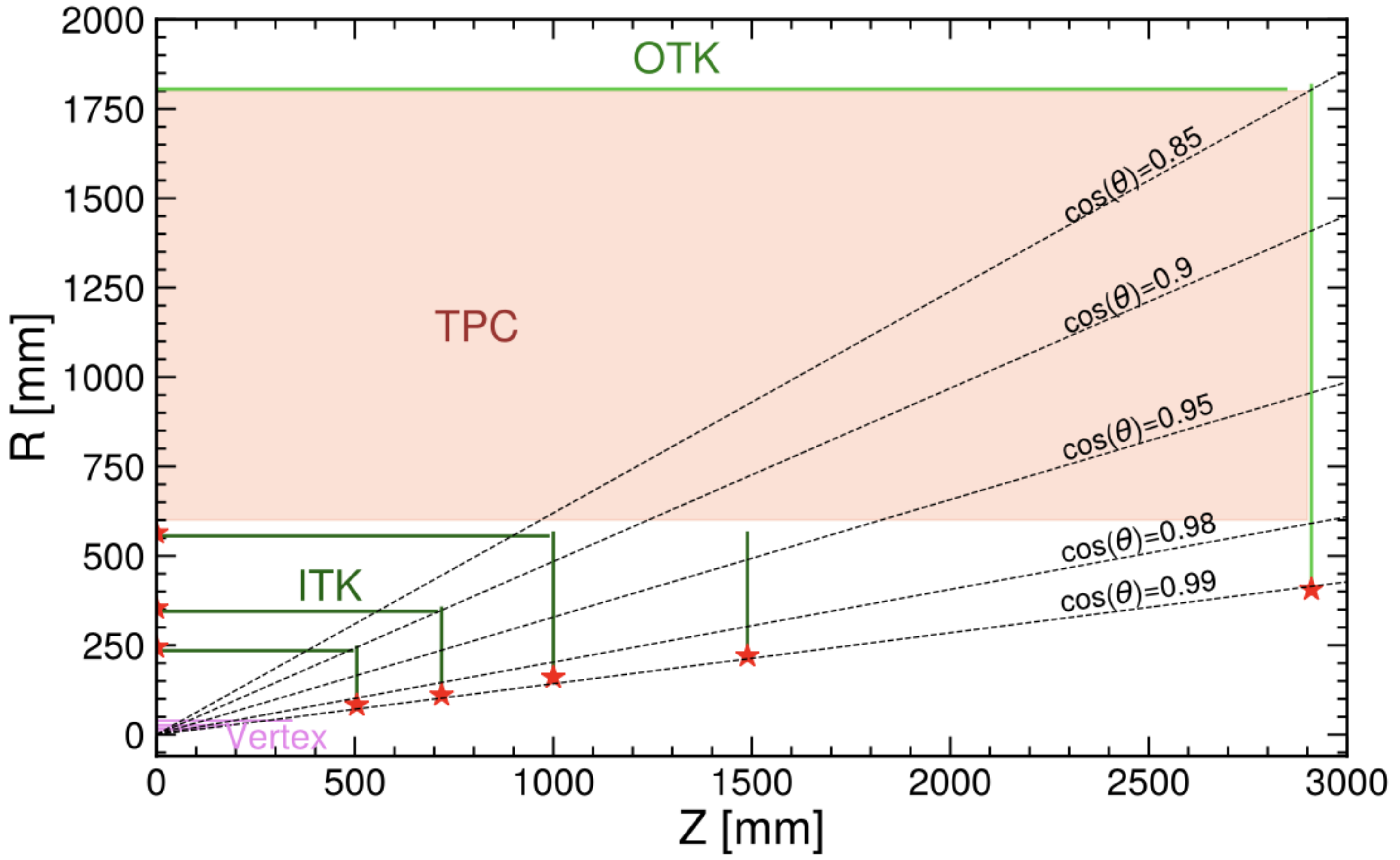


Figure 2.4: Layout of the tracking system of the reference detector. The innermost is silicon vertex detector with six barrel layers shown by magenta lines. The green lines represent Inner Silicon Tracker (ITK) and Outer Silicon Tracker (OTK) with four layers in barrel region and five disks in both sides of the endcap. The OTK provides both high-precision spatial (~ 10μm) and timing measurements (~ 50 ps), which can serve as ToF. The light orange area represents TPC which is embedded in a silicon tracker.

- Good, but repeated from chapter 2
- Caption could indicate that this figure is a reproduction of Figure 2.4 and keep it to facilitate reading
  - Captions are different between the two….
- **Former table from Chapter 5, with overview of all tracking should be moved to Chapter 2**

Chapter 5 - Table 5.1

- **Former table from Chapter 5, with overview of all tracking should be moved to Chapter 2**

Table 5.1: Parameters and layout of the Silicon Tracker. Silicon pixel sensors (HV-CMOS) and Low Gain Avalanche Detector (LGAD) technologies are planned for the ITK and OTK baseline, respectively. The column labelled $\pm z$ shows the half-length of the barrel layers, and the z position of the end-cap disks. The column labelled σ_ϕ and σ_t represent the spatial resolution in the bending direction and time resolution, respectively. The main parameters of the VTX and the TPC are also listed here for completeness.

Detector		**Radius R [mm]**		**$\pm z$ [mm]**	**Material budget [% X_0]**	**σ_ϕ [μm]**	**σ_t [ns]**
VTX	Layer 1	11.06		80.7	0.06	3	100
	Layer 2	16.56		121.1	0.06	3	100
	Layer 3	22.06		161.5	0.06	3	100
	Layer 4	27.56		201.9	0.06	3	100
	Layer 5	39.32		341.0	0.32	3	100
	Layer 6	39.69		341.0	0.32	3	100
ITK Barrel	Layer 1 (ITKB1)	235.0		493.3	0.68	8	3-5
	Layer 2 (ITKB2)	345.0		704.8	0.68	8	3-5
	Layer 3 (ITKB3)	555.6		986.6	0.68	8	3-5
OTK Barrel	Layer 4 (OTKB)	1,800		2,840	1.6	10	0.05
TPC	Inner wall	600		2900	0.16	—	
	Gas	625-1775		2761	~ 1	110-144 (220 hits)	
	Outter wall	1800		2900	0.16	—	
		R_{in}	**R_{out}**				
ITK Endcap	Disk 1 (ITKE1)	82.5	244.7	505.0	0.76	8	3-5
	Disk 2 (ITKE2)	110.5	353.7	718.5	0.76	8	3-5
	Disk 3 (ITKE3)	160.5	564.0	1,000	0.76	8	3-5
	Disk 4 (ITKE4)	220.3	564.0	1,489	0.76	8	3-5
OTK Endcap	Disk 5 (OTKE)	406.0	1,816	2,910	1.4	10	0.05

Table 5.1: Parameters and layout of the Silicon Tracker. The column labelled $\pm z$ shows the half-length of the barrel layers, and the z position of the end-cap disks. The column labelled σ_ϕ and σ_t represent the spatial resolution in the bending direction and time resolution, respectively.

Detector		**Radius R [mm]**		**$\pm z$ [mm]**	**Material budget [% X_0]**	**σ_ϕ [μm]**	**σ_t [ns]**
ITK Barrel	Layer 1 (ITKB1)	235.0		493.3	0.68	8	3-5
	Layer 2 (ITKB2)	345.0		704.8	0.68	8	3-5
	Layer 3 (ITKB3)	555.6		986.6	0.68	8	3-5
OTK Barrel	Layer 4 (OTKB)	1,800		2,840	1.6	10	0.05
		R_{in}	**R_{out}**				
ITK Endcap	Disk 1 (ITKE1)	82.5	244.7	505.0	0.76	8	3-5
	Disk 2 (ITKE2)	110.5	353.7	718.5	0.76	8	3-5
	Disk 3 (ITKE3)	160.5	564.0	1,000	0.76	8	3-5
	Disk 4 (ITKE4)	220.3	564.0	1,489	0.76	8	3-5
OTK Endcap	Disk 5 (OTKE)	406.0	1,816	2,910	1.4	10	0.05

Modified

Chapter 5

- Subfigure numbering (a), (b) should be done in latex, instead of incorporating into the figures

Modified

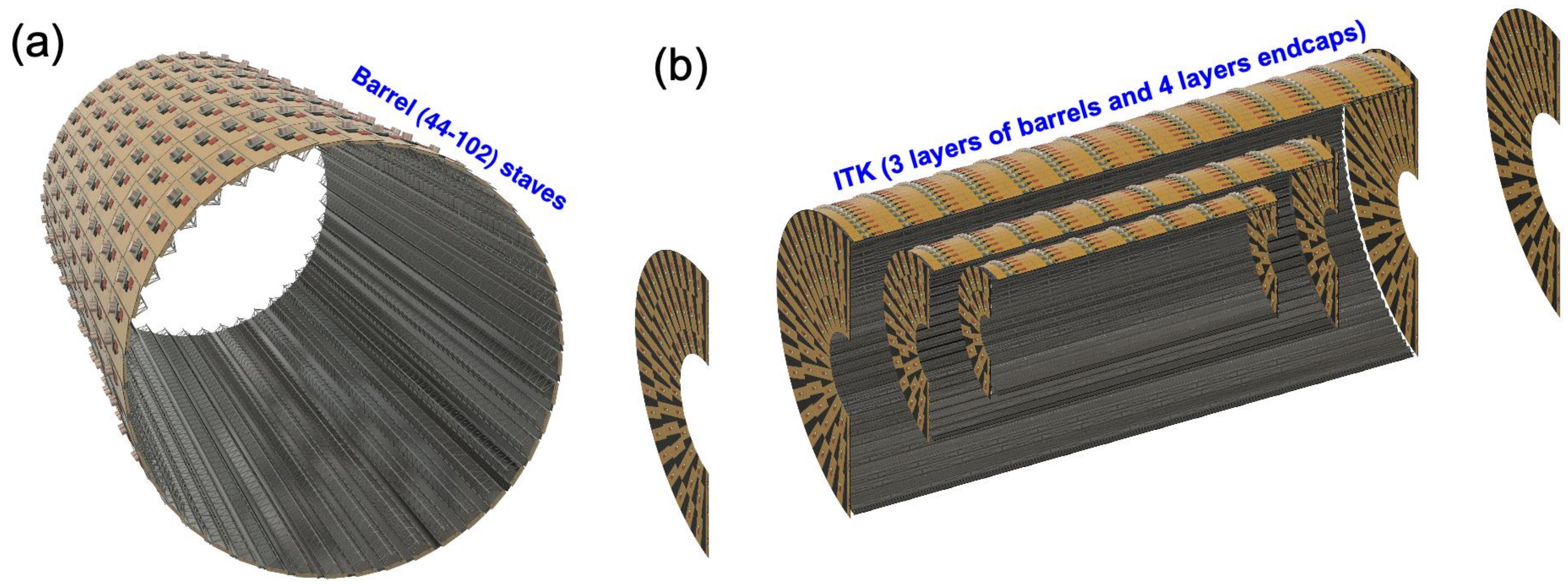


Figure 5.3: (a) ITK barrel and (b) ITK comprising 3 layers of barrels and 4 layers of endcaps. Each ITK barrel contains 44, 64, or 102 staves arranged in a staggered structure to mimimize dead area.

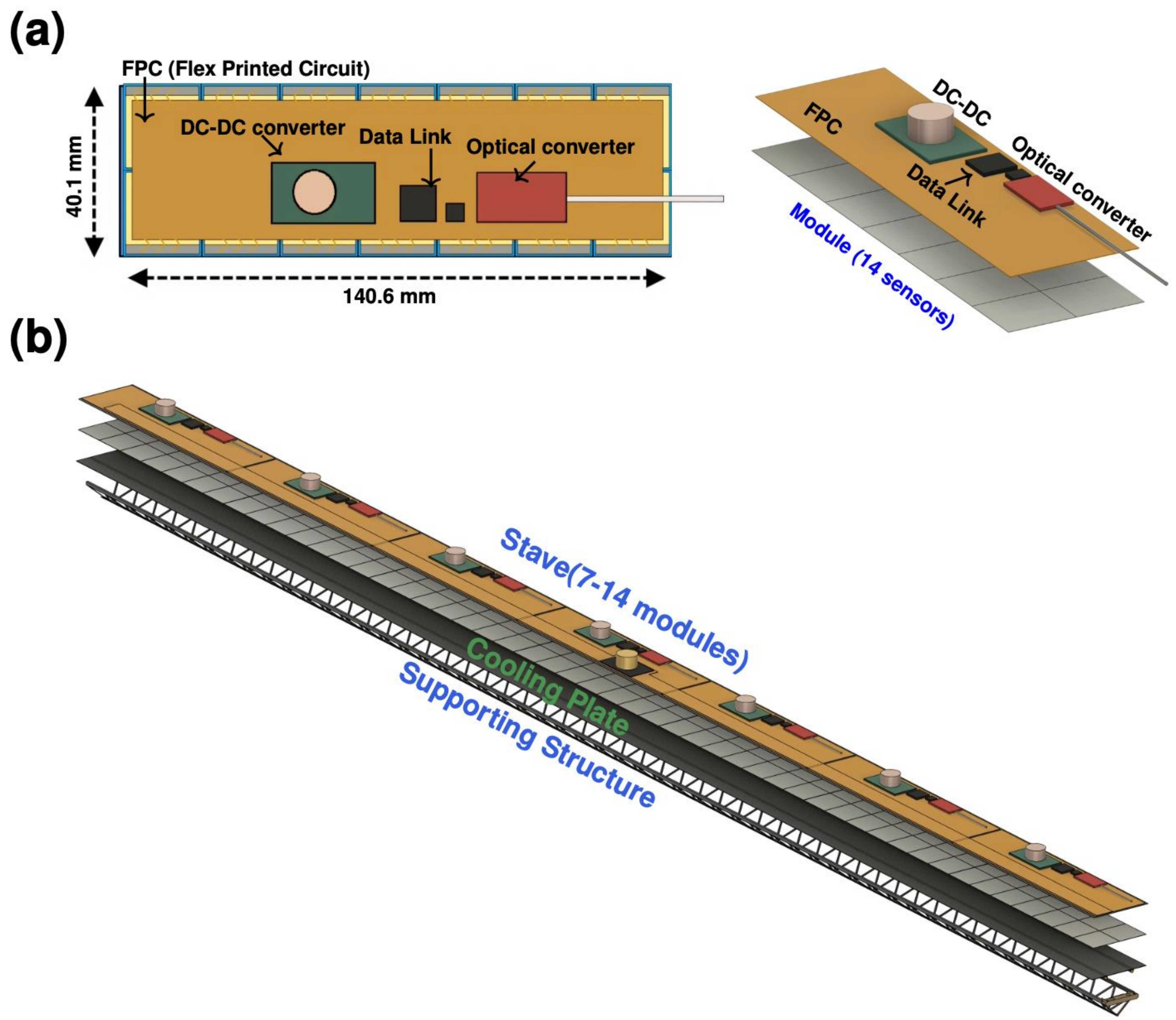


Figure 5.2: (a) ITK module and (b) ITK stave. The ITK module consists of 2×7 monolithic HV-CMOS pixel sensors, with their backside glued to a FPC board integrated with electronic components, including DC-DC converters, a data aggregation chip, a data link chip, and an optical converter. Each ITK stave is made up of 7, 10, or 14 modules, one or two long power bus FPCs, a plate with embedded cooling tubes, and a truss supporting structure.

Chapter 5

- Use subfigure numbering (a), (b) instead of left and right
- Indicate what “front” and “back” means, with front being closer to the IP. This is the first time such naming shows up

Modified

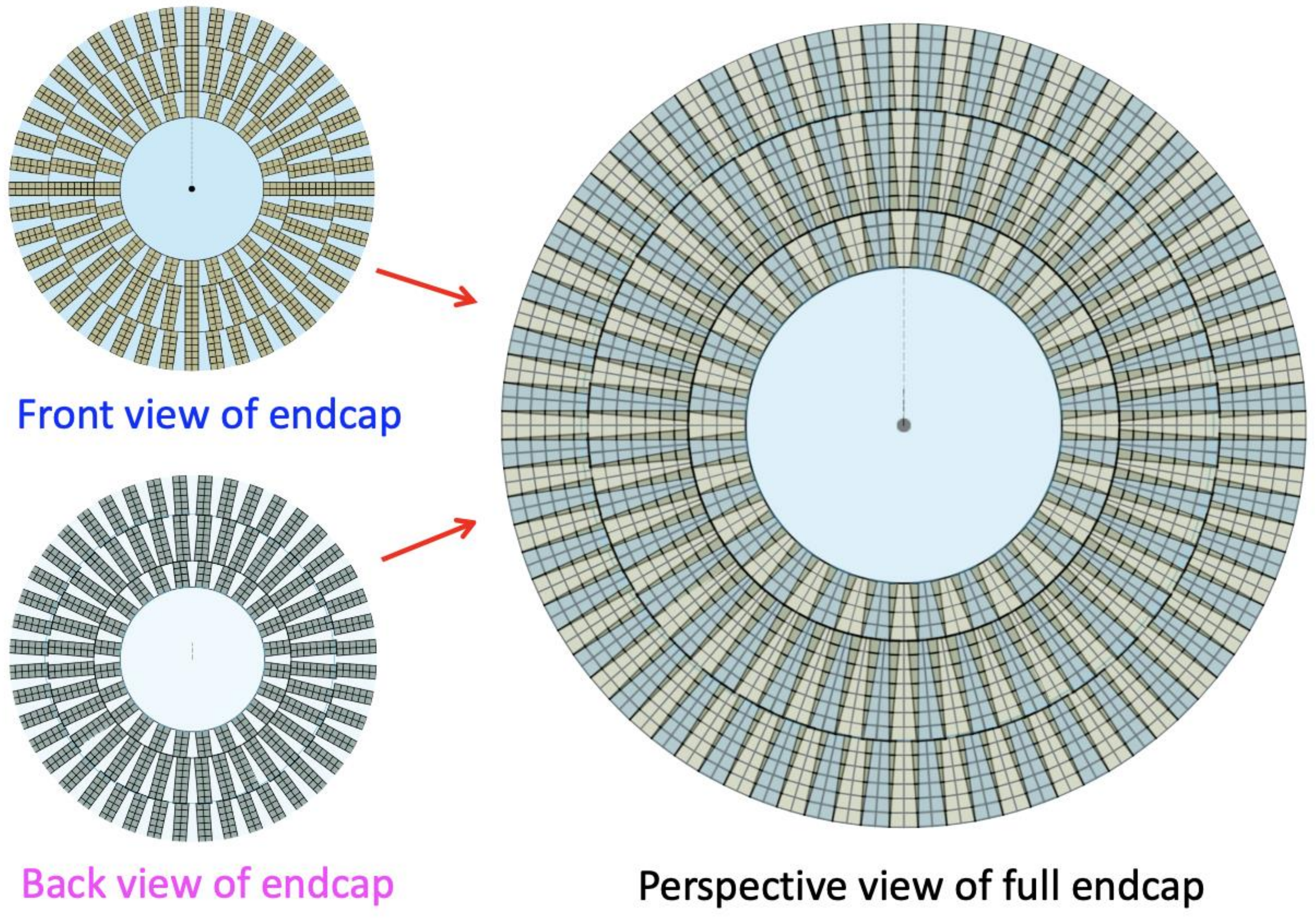


Figure 5.4: Perspective view of the sensor and module distribution for the fourth ITK endcap. The ITK endcap has double-sided detection faces (left), with the module layout on the two faces compensating for each other to minimize the dead detection area (right). The overlapping detection regions of the modules from the two faces are highlighted in dark green triangles.

Chapter 5

Modified

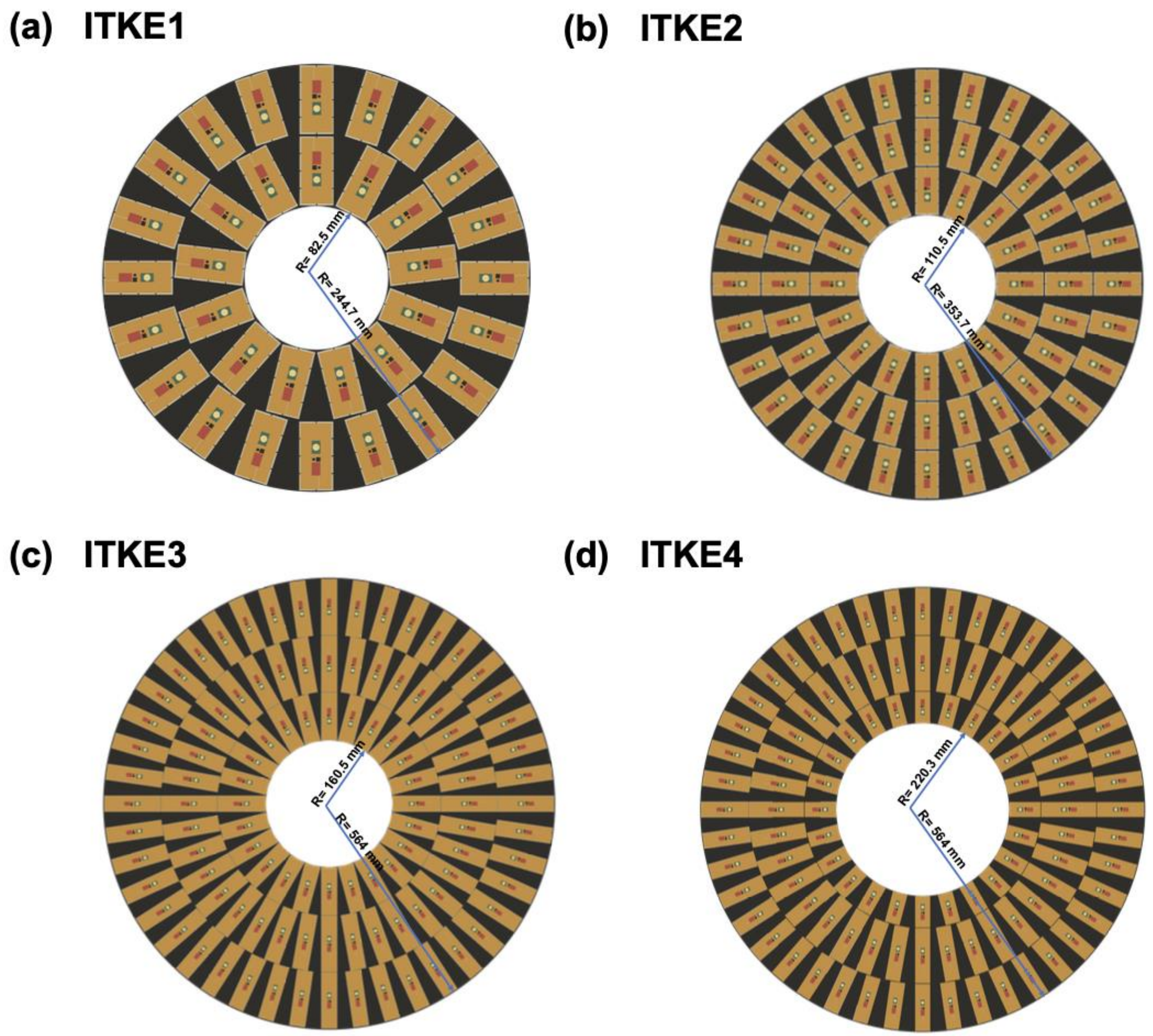


Figure 5.5: The module layout of the four ITK endcaps ITKE1(a), ITKE2(b), ITKE3(c), and ITKE4(d). Details are given in Table 5.5.

- Subfigure numbering (a), (b) should be done with latex.
  - Not sure if this split is needed since each endcap is already labelled and the different figures are not referenced separately
- Font for dimensions is extremely small. Text not readable. Could remove the “R =“ to get more space. Caption could mention that the radial dimensions are provided in the figures.

Chapter 5

Modified

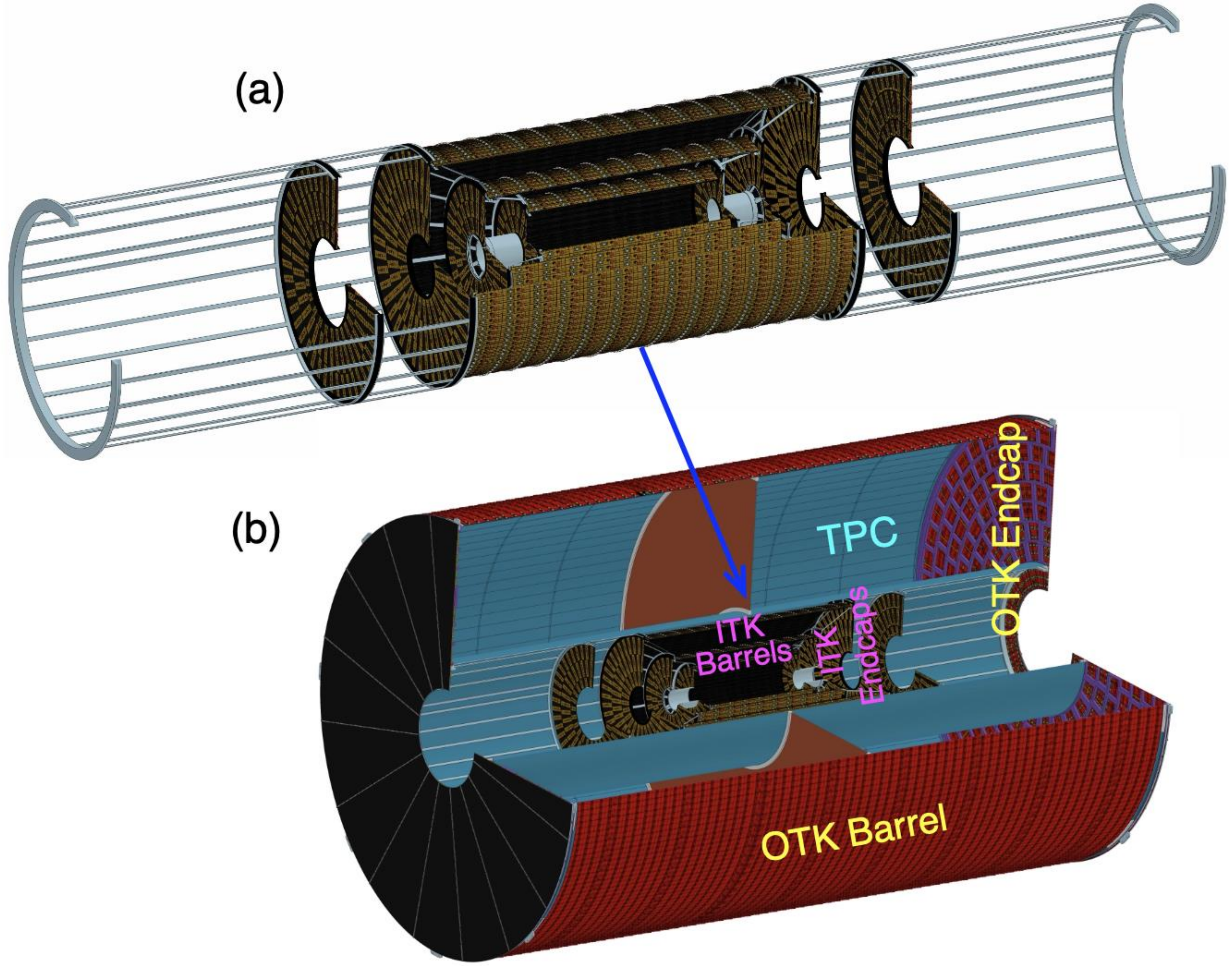


Figure 5.9: (a) Structure of the ITK, consisting of three barrel layers built from azimuthally segmented staves, and four pairs of endcaps mounted onto two end-wheel structures. Together with two extended connection rings, they form the complete ITK assembly. (b) Layout of the OTK (red), TPC (blue), and ITK (yellow). The OTK system consists of azimuthally segmented barrel staves and a pair of endcaps.

- Subfigure numbering (a), (b) should be done with latex.
- Figure 5.9b does not seem to be referenced in the text, and it does not bring any new information. At most, this could be in chapter 2, or mechanics when discussing the integration of the detectors

Chapter 5

Modified

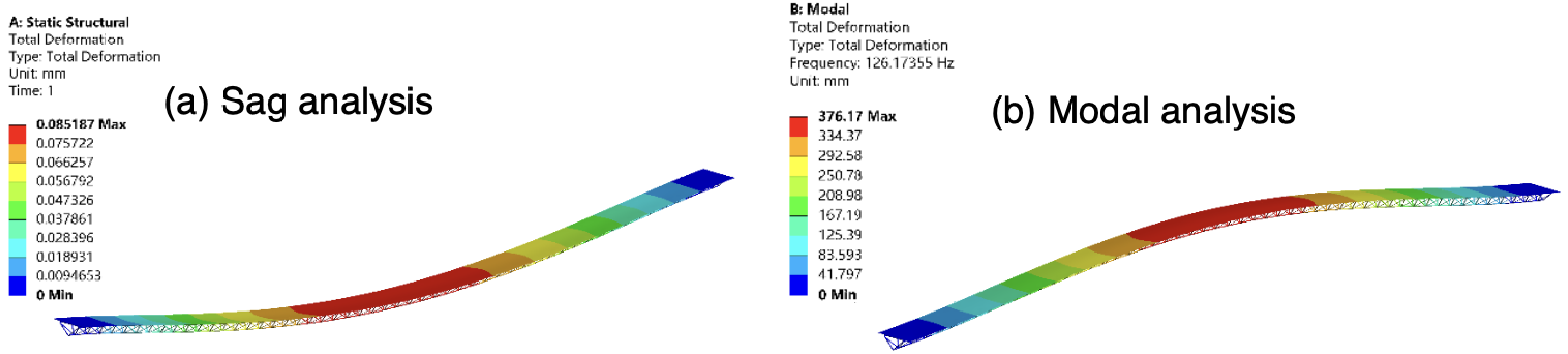
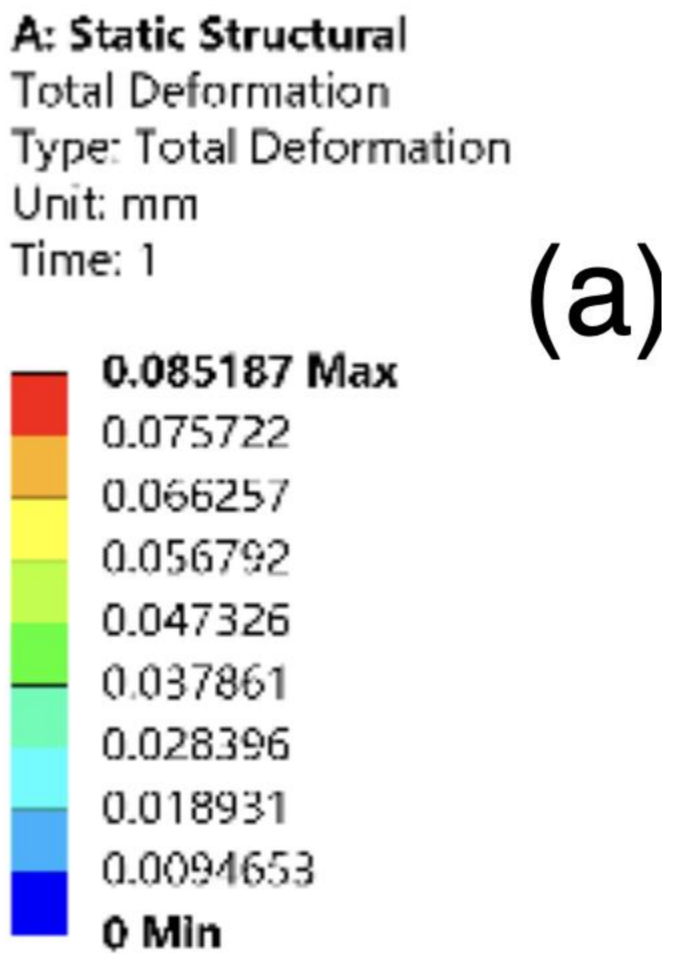


Figure 5.11: Results of (a) gravitational sag analysis and (b) modal analysis for the stave of the first ITK barrel (ITKB1). Both ends of the stave were assumed to be fixed supports. The blue color indicates zero movement, while the red lines represent maximum movement. The maximum sag is 85 µm, and the first natural frequency is 126 Hz.

- A nice caption for this kind of plot!
- Subfigure numbering (a), (b) should be done with latex.
- Font is too small and too many significant digits: 2 or 3 significant figures is enough, allowing space for larger fonts
- Figure is of bad quality. It seems to be two screenshots, merged and converted to PDF!



Chapter 5

Modified

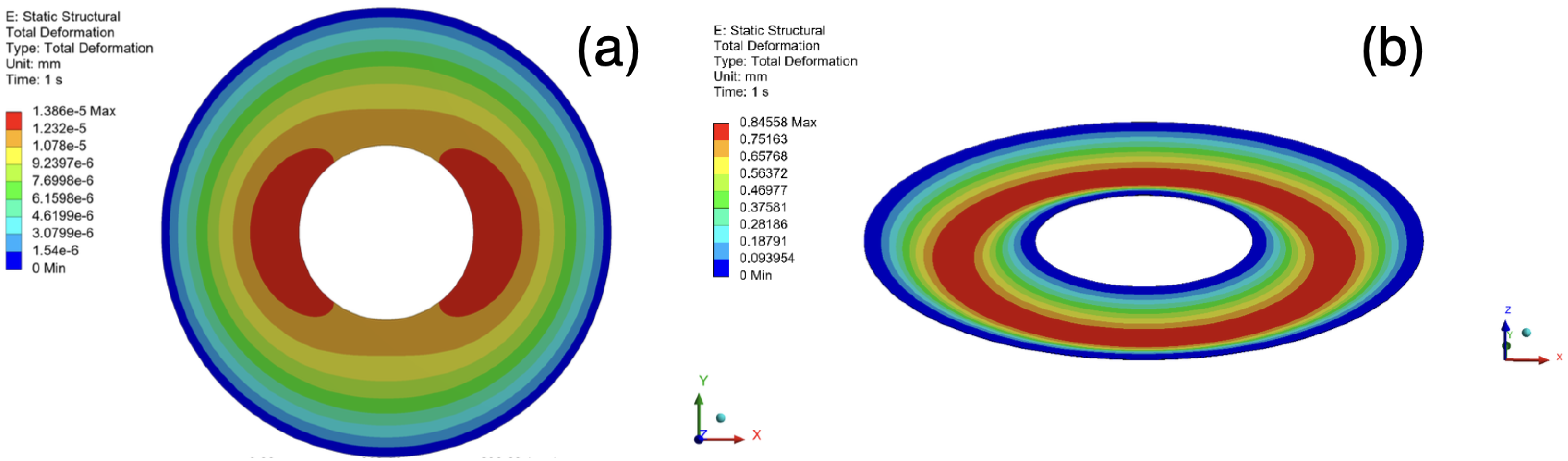


Figure 5.14: Deformations of the fourth ITK endcap in (a) the nominal position, with the outer ring of the endcap assumed to be a fixed support, and (b) the flat-lying position, with both the inner and outer rings of the endcap assumed to be fixed supports. The maximum sag is 0.8 mm in the flat-lying position (b), and negligible (< 1 μm) in the nominal position (a).

- Subfigure numbering (a), (b) should be done with latex.
- Font is too small and too many significant digits: 2 or 3 significant figures is enough, allowing space for larger fonts

Chapter 5

Modified

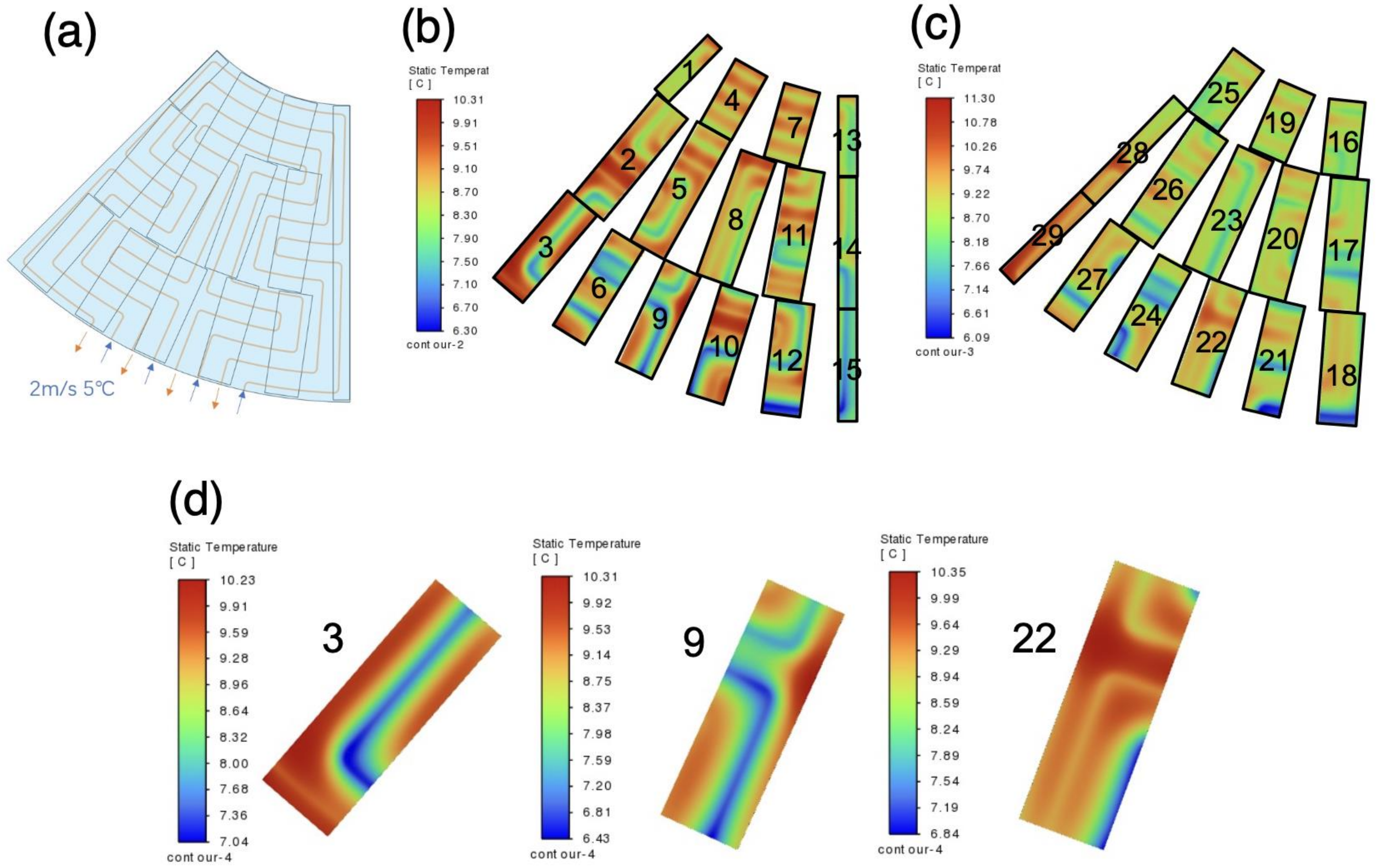


Figure 5.15: (a) Designed cooling loops for one eighth of the ITK endcap, featuring four closed loops arranged radially across 16 coil layers. Sensor temperature distributions for one eighth of the ITK endcap: (b) front-side sensors, (c) back-side sensors, and (d) three modules. All sensor temperatures remain below 11.3°C, and the maximum temperature difference across the plane is less than 5°C.

- Composite figure merged into a pdf file, quality is not optimal but acceptable. Some fonts are rather small. Probably not distinguishable on paper
- Caption: needs to mention the 2m/s 5C from first plot. What are the numbers? The "e" from the word "temperature" is cut off in two plots

Chapter 5

Modified

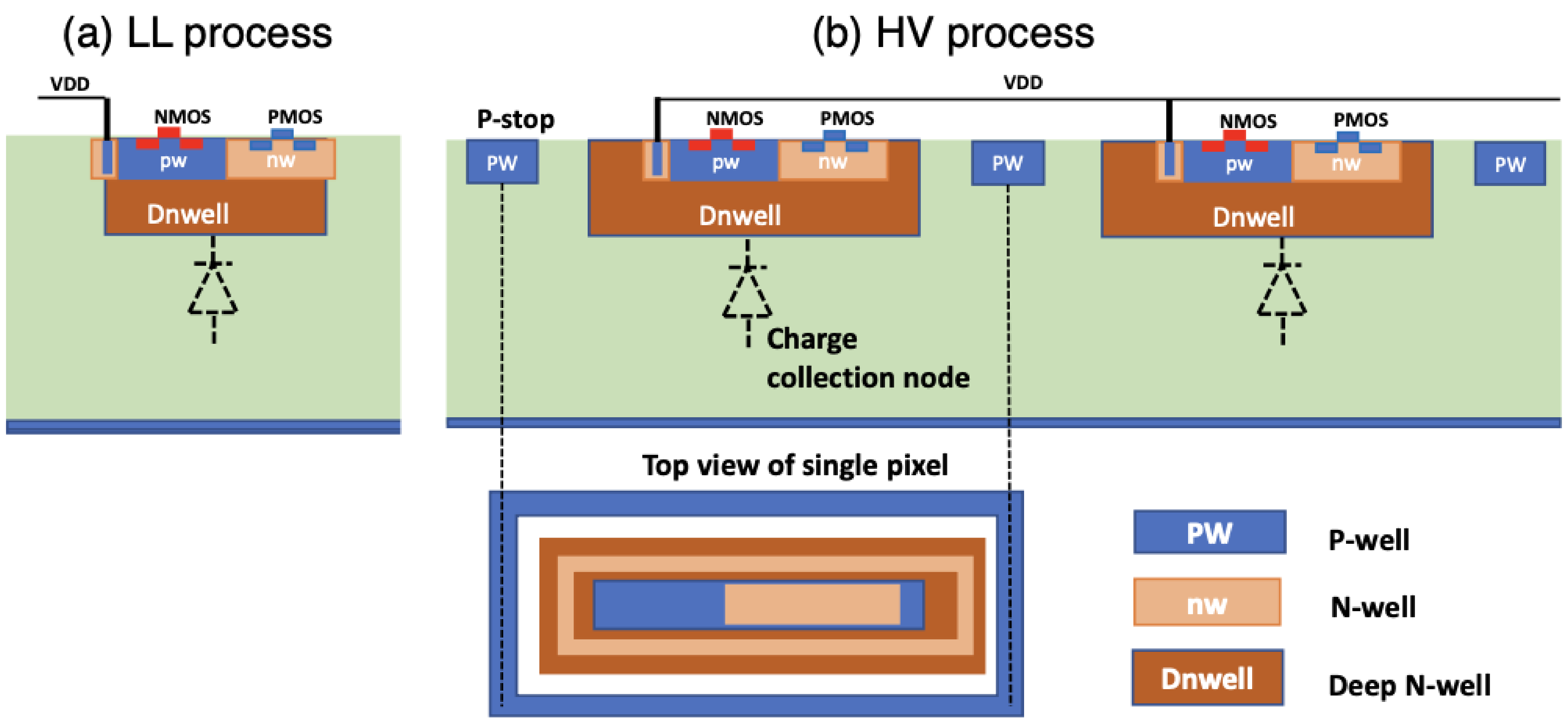


Figure 5.16: Cross-sections of the 55nm (a) Low-Leakage and (b) High-Voltage CMOS processes. The Low-Leakage process was used in the COFFEE1 chip, while the High-Voltage CMOS process was adopted in the COFFEE2 chip.

- Should use latex to number subfigures (a), (b)
- Separate figures (a) and (b) more clearly. Now some people might think it is the same figure

Chapter 5

Modified

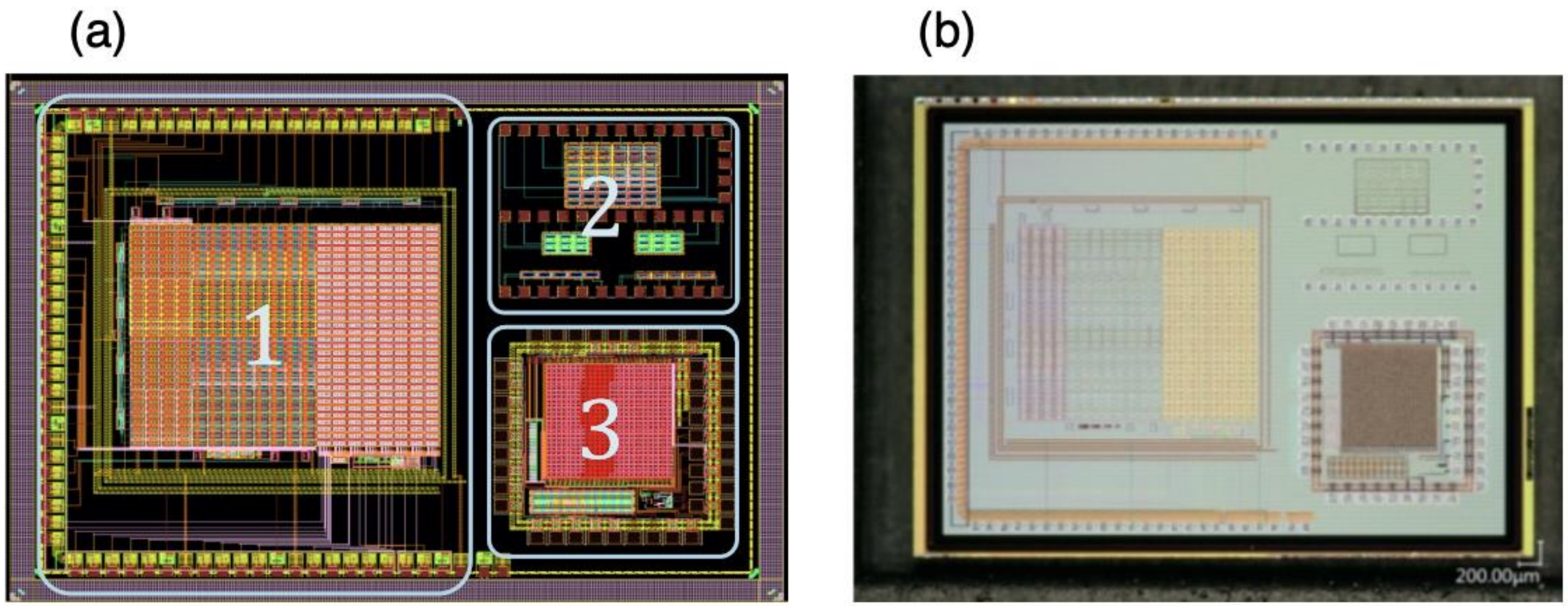


Figure 5.17: (a) Floorplan and (b) photo of the COFFEE2 chip. The chip comprises three sections: Section 1 contains diode arrays and in-pixel circuits; Section 2 consists of passive diode arrays similar to those in COFFEE1; Section 3 is designed for imaging applications with small pixels and is not directly relevant to the CEPC use case.

- Should use latex to number subfigures (a), (b)
- Separate figures (a) and (b) more

Chapter 5

- The subtitles should be capitalized
  - In-pixel electronics
  - Amplifier schematic
  - Comparator and output stage
- Nice explanation in caption but really much longer than similar caption in chapter 4, Figure 4.13

Modified

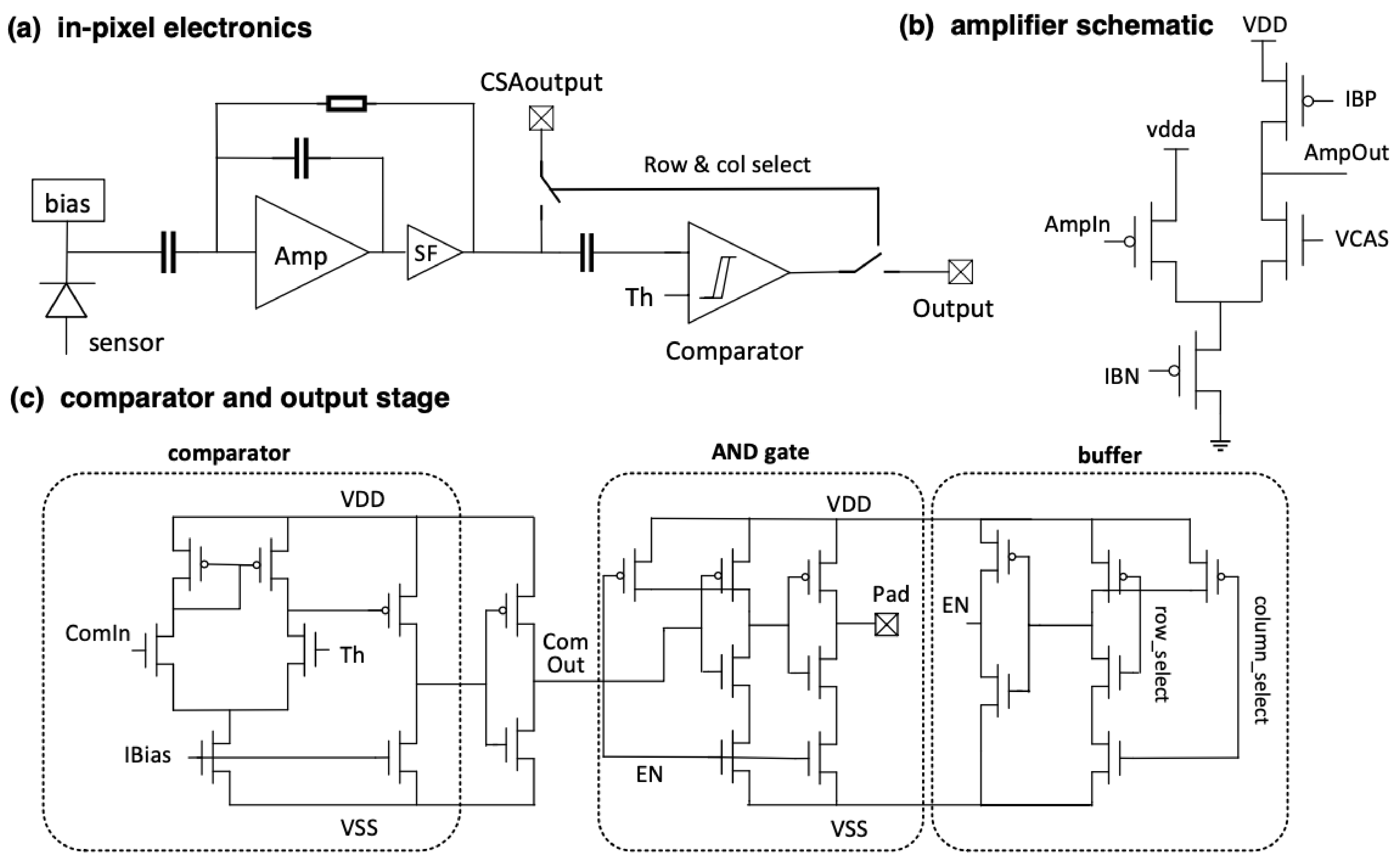


Figure 5.18: Schematic diagram of in-pixel electronics in Section 1 of COFFEE2. (a) The sensor generates a signal that is amplified by a charge-sensitive amplifier, consisting of a gain stage (Amp) and a source follower (SF). The amplified signal, labeled as "CSAoutput", is AC-coupled to a comparator, which converts the analog signal into a digital output. This output is routed to the exterior of the pixel via a shared output bus per column, with row and column select signals managing the pixel address. (b) Schematic of the amplifier (Amp), which operates using the current bias "IBN" and the voltage bias "VCAS". (c) Detailed circuit elements of the comparator and output stage. The comparator compares the input signal "ComIn" with the threshold reference "Th", using "IBias" as the current bias. The output signal "ComOut" passes through an AND gate and a buffer before reaching the external output pad. This configuration ensures robust digital signal readout, controlled by enable signals "EN", and facilitates row and column selection via "row_select" and "column_select". All bias signals are externally controlled, allowing fine-tuning of the amplifier during testing.

Chapter 5

Modified

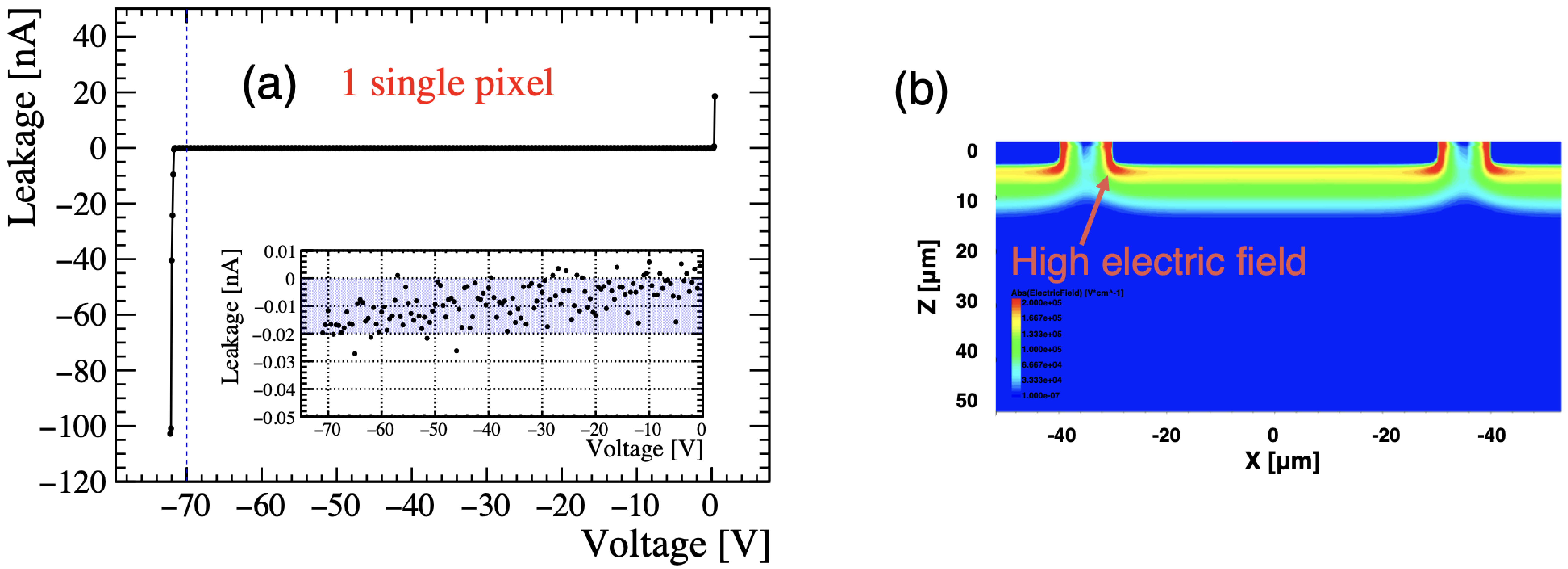


Figure 5.19: (a) IV curve of a pixel in COFFEE2 chip; (b) TCAD simulation of the passive diode under a reverse bias of −70 V. The breakdown voltage of the COFFEE2 chip is around −70 V, and the leakage current is at the pA level before breakdown.

- Should use latex to number subfigures (a), (b)
- Some fonts really too small, in particular the ones for the TCAD simulation!! Need to increase size

Chapter 5

Modified

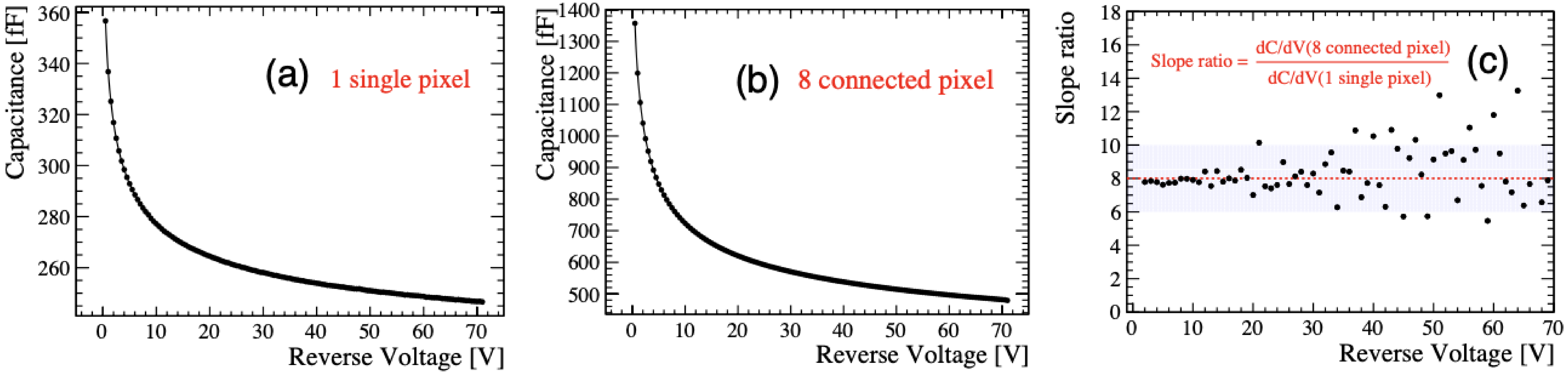


Figure 5.20: CV curves of (a) a pixel, (b) 8 connected pixels in the COFFEE2 chip, and (c) the ratio of capacitance of 8 pixels with respect to 1 pixel as a function of reverse bias. With the offset subtracted, the capacitance of a single pixel is 30 – 40 fF at a bias of –70 V.

- Should use latex to number subfigures (a), (b)
- Some fonts really too small, in particular the ones for the TCAD simulation!! Need to increase size

Chapter 5

Modified

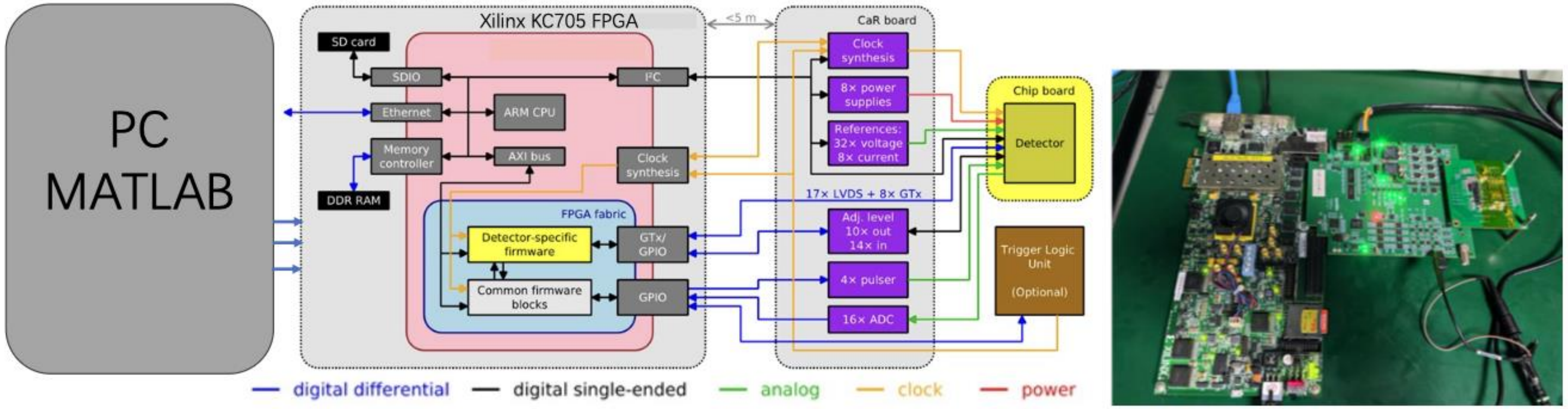


Figure 5.21: Test setup for COFFEE2 chip, consisting of a dedicated carrier board, a general-purpose control and readout board, an FPGA board, and a personal computer.

- Detailed schematic of testing board is not useful for a TDR. Can easily remove this figure.
  - Text is too small, not readable. We should simply with overall blocks, if we want to keep this, otherwise remove Figure
- There are two figures. Should use latex to number subfigures (a), (b)

Chapter 5

Modified

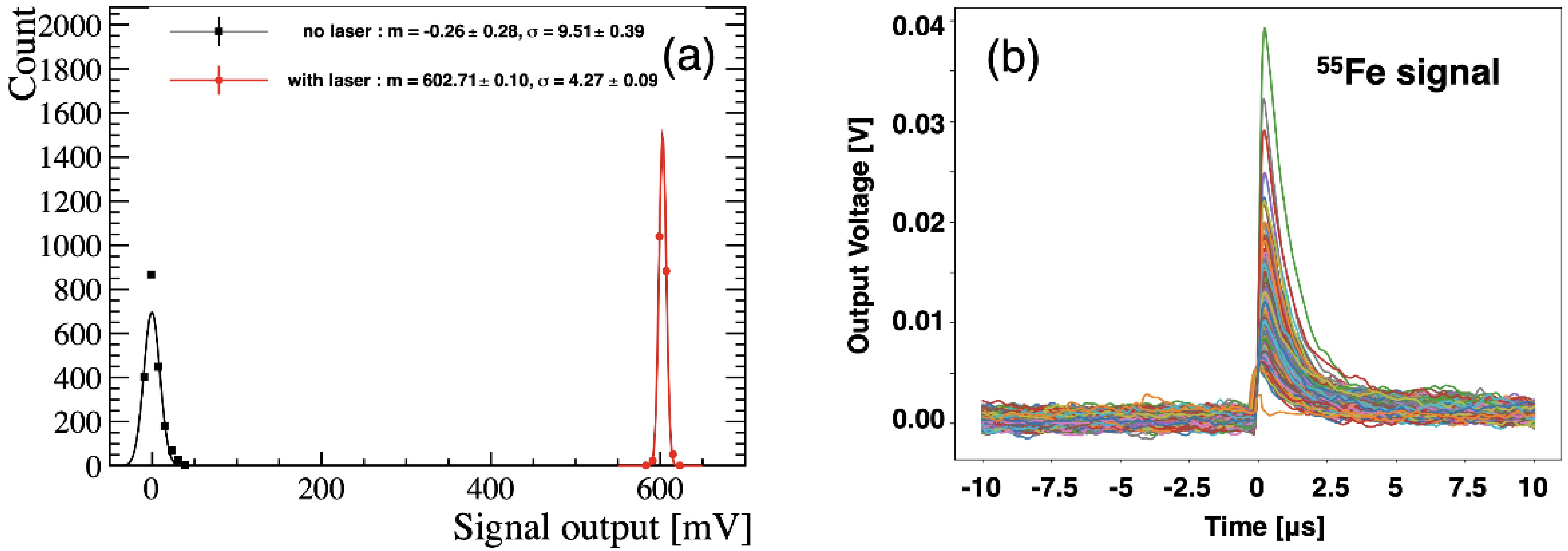


Figure 5.22: Responses to (a) red laser signals and (b) X-rays from ^{55}Fe in a pixel of COFFEE2. Clear signal responses were observed for both the red laser and the ^{55}Fe radioactive source.

- Text in (a) is too small, not readable. Remove it or increase font size
- Should use latex to number subfigures (a), (b)
- Caption should explain what is black and red curve
- Format style of these two figures side by side is different! This does not follow the recommended style provided by macro
  - No CEPC label

Chapter 5

- Another figure collection without much relation between parts.
  - At least the schedule should be a different figure. No point of saving space this way.
  - The timetable 5.23c is mentioned in the text before 5.23a and 5.23b
    - They should show up in order
  - Text in (a) is too small, not readable. I would suggest to make diagram bigger in its own figure
- Should use latex to number subfigures (a), (b)
- Split into 2 or 3 figures

Modified

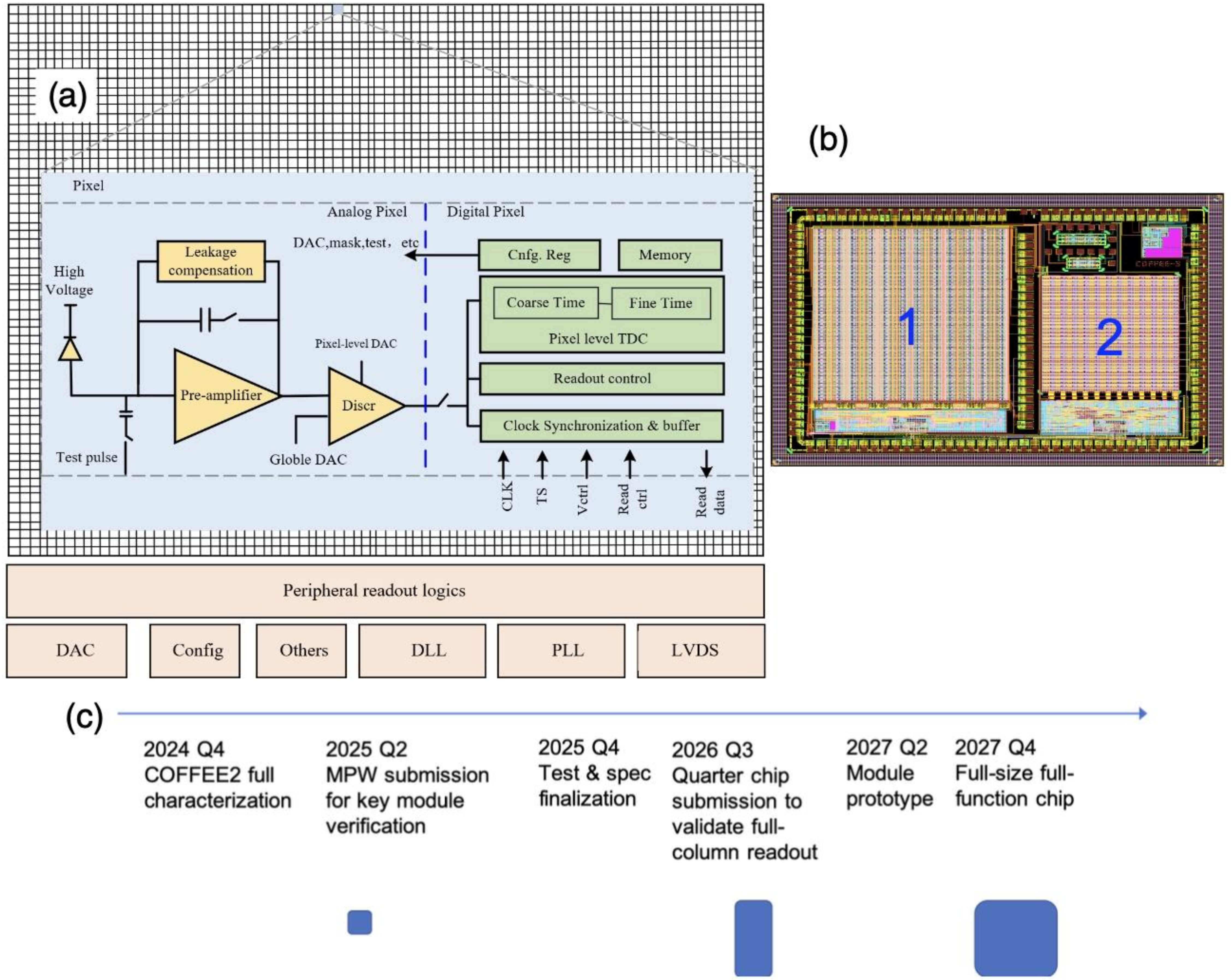


Figure 5.23: (a) Block diagram of the new data-driven readout architecture of the HV-CMOS sensor, featuring in-pixel fine time-to-digital converters (Time-To-Digital Converters (TDCs)). (b) Layout of the COFFEE3 sensor chip, consisting of two distinct pixel array sections: Section 1 features a CMOS-based array, utilizing both PMOS and NMOS transistors, while Section 2 contains an NMOS-only pixel array, using exclusively NMOS transistors. (c) Timeline of HV-CMOS development, with blue squares below indicating the relative chip sizes. After several rounds of tape-outs over 3 years, the HV-CMOS sensor is progressing toward a fully functional, full-scale sensor chip.

Chapter 5

Modified

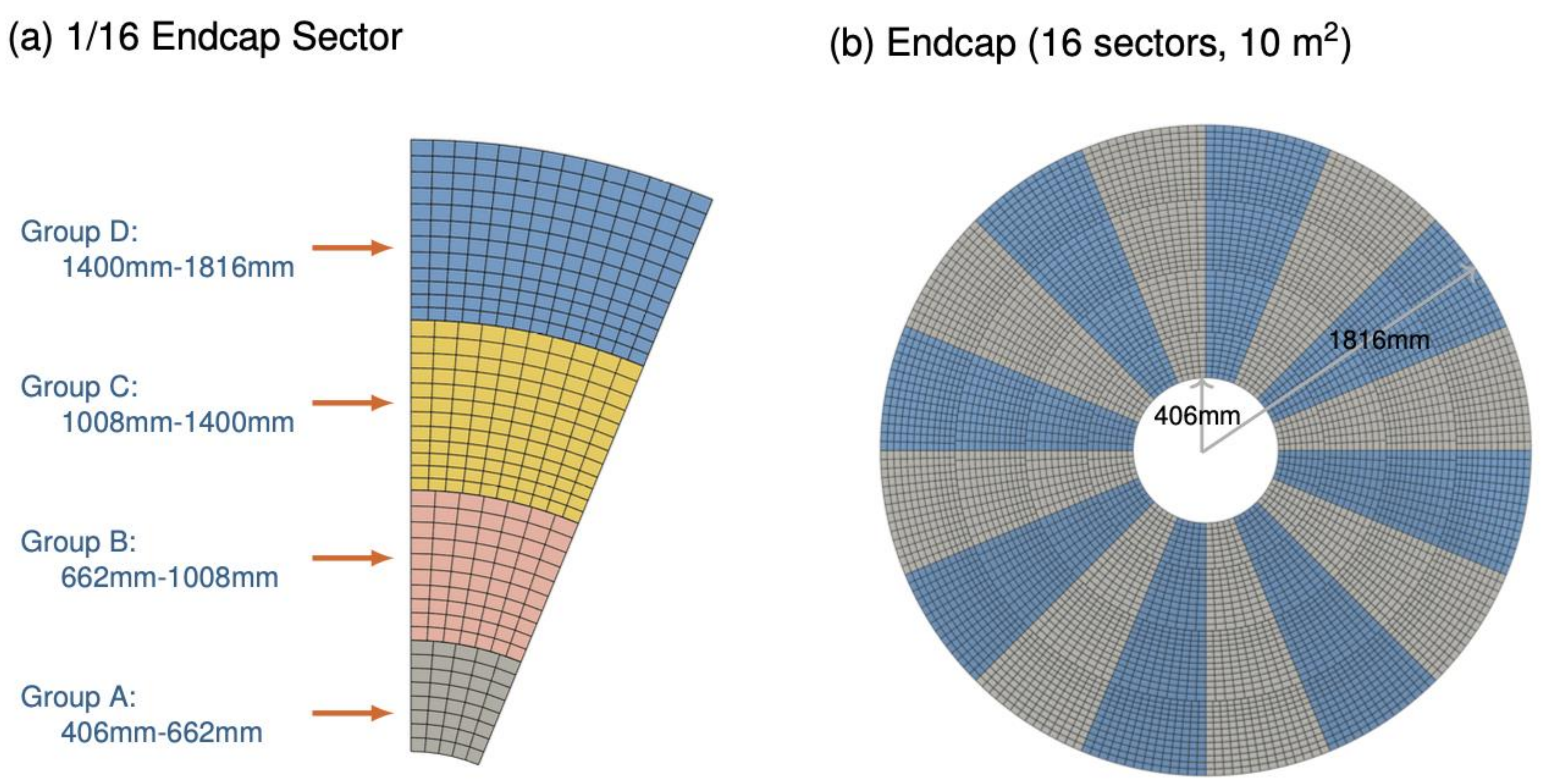


Figure 5.26: OTK sensor layout for (a) the 1/16 endcap sector and (b) the full endcap. The 1/16 sector of the OTK endcap consists of 42 rings of trapezoidal sensors, which are arranged into four groups: Group A, Group B, Group C, and Group D, each indicated by a different color.

- Add space between number and units, e.g. 1400 m (not 1400mm)
- Should use latex to number subfigures (a), (b)
  - Note that the style of this labeling is different from previous figures (e.g. Fig 5.24). This is why it should be made in Latex

Chapter 5

- Fonts too small to be readable. Is this what we want?
- What is the significance of the dashed line? Some sensors are outside the line… better move the line?
- Missing units
- Should use latex to number subfigures (a), (b)

Modified

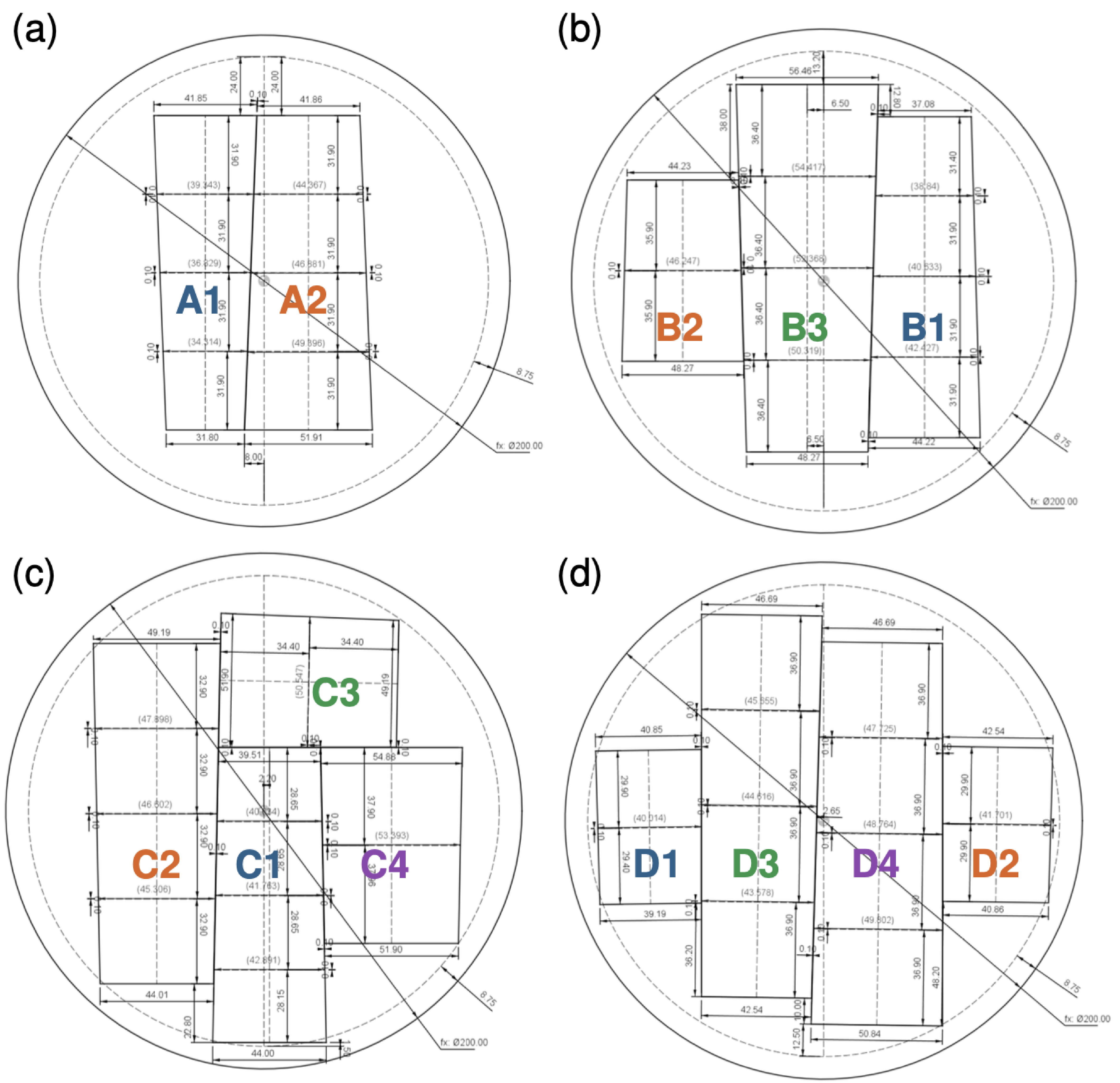


Figure 5.27: Four groups (A, B, C, and D) of OTK endcap sensors diced from 8” silicon wafer. Sensor subgroups B2, C3, C4, D1, and D2 each contain 2 trapezoidal sensors, while subgroups A1, A2, B1, B3, C1, C2, D3, and D4 each contain 4 sensors.

Chapter 5

Modified

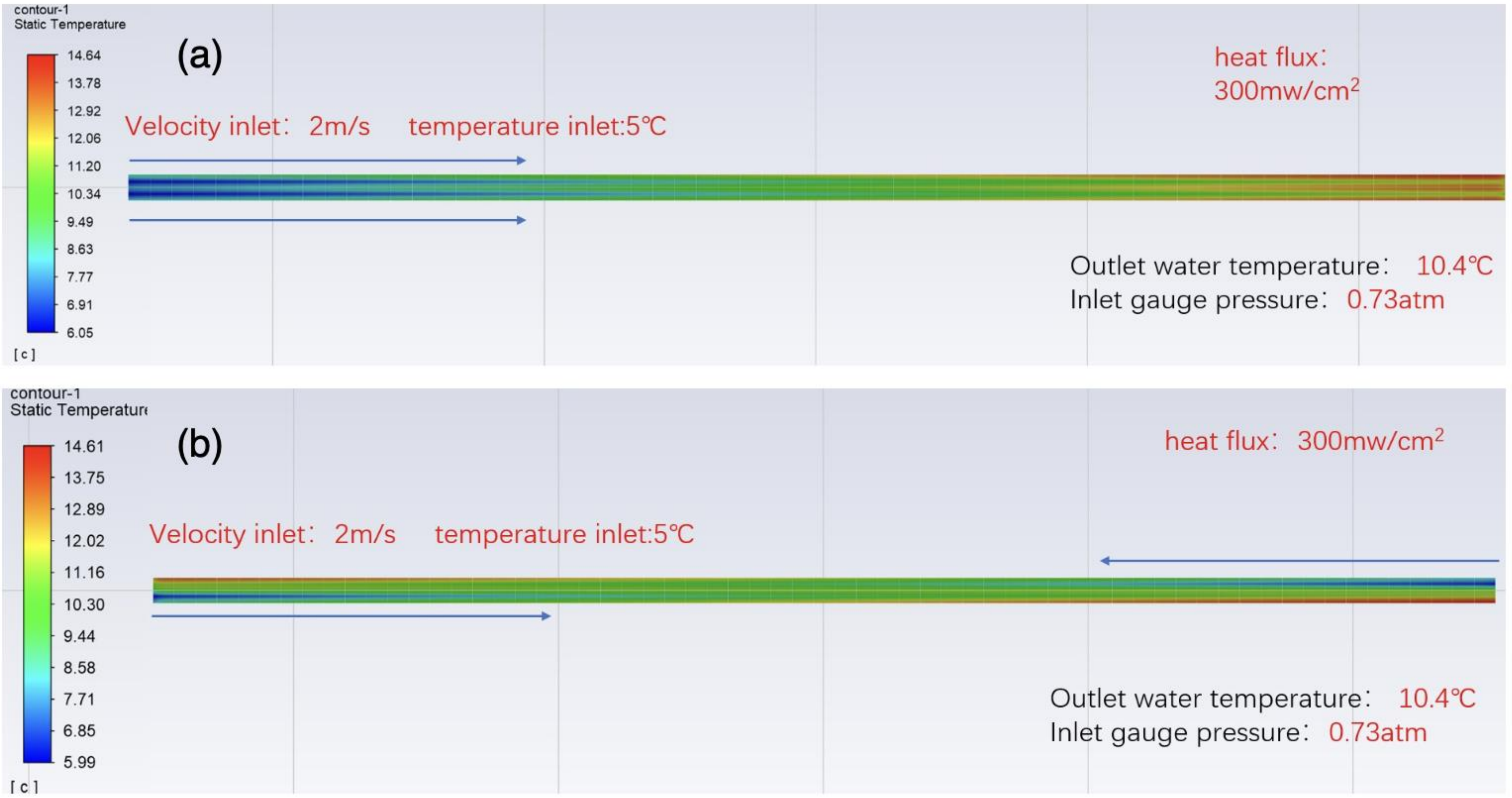
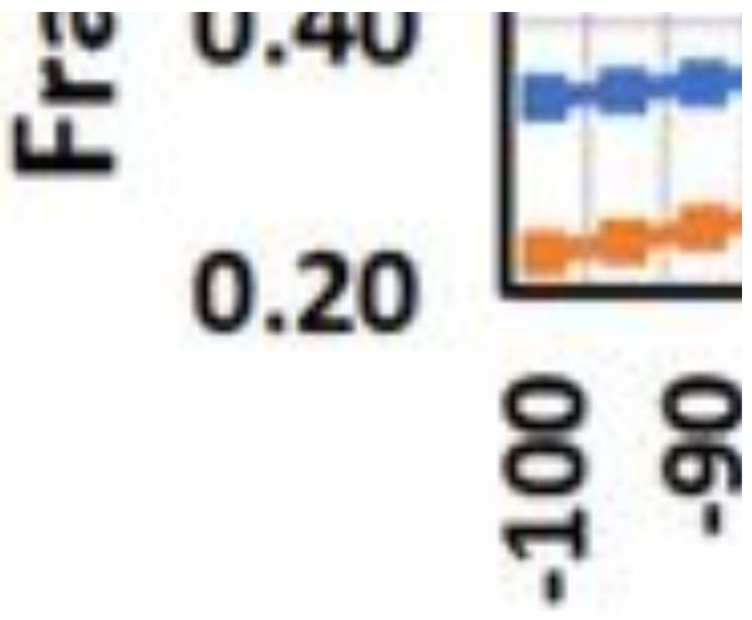


Figure 5.31: Simulation results of water cooling with a flow velocity of 2 m/s and an inlet temperature of 5°C for the OTK stave: (a) inlets on the same side and (b) inlets on both sides. The temperature across the stave remains below 14.6°C, and the temperature gradient along the stave is within 8.6°C.

- Font size of legend of top graph is smaller than the bottom one. They should be the same if displayed like this, in the same Figure.
- The word “temperature” has the “e” cut off
- Should use latex to number subfigures (a), (b)

Chapter 5



5.36: Charge

Modified

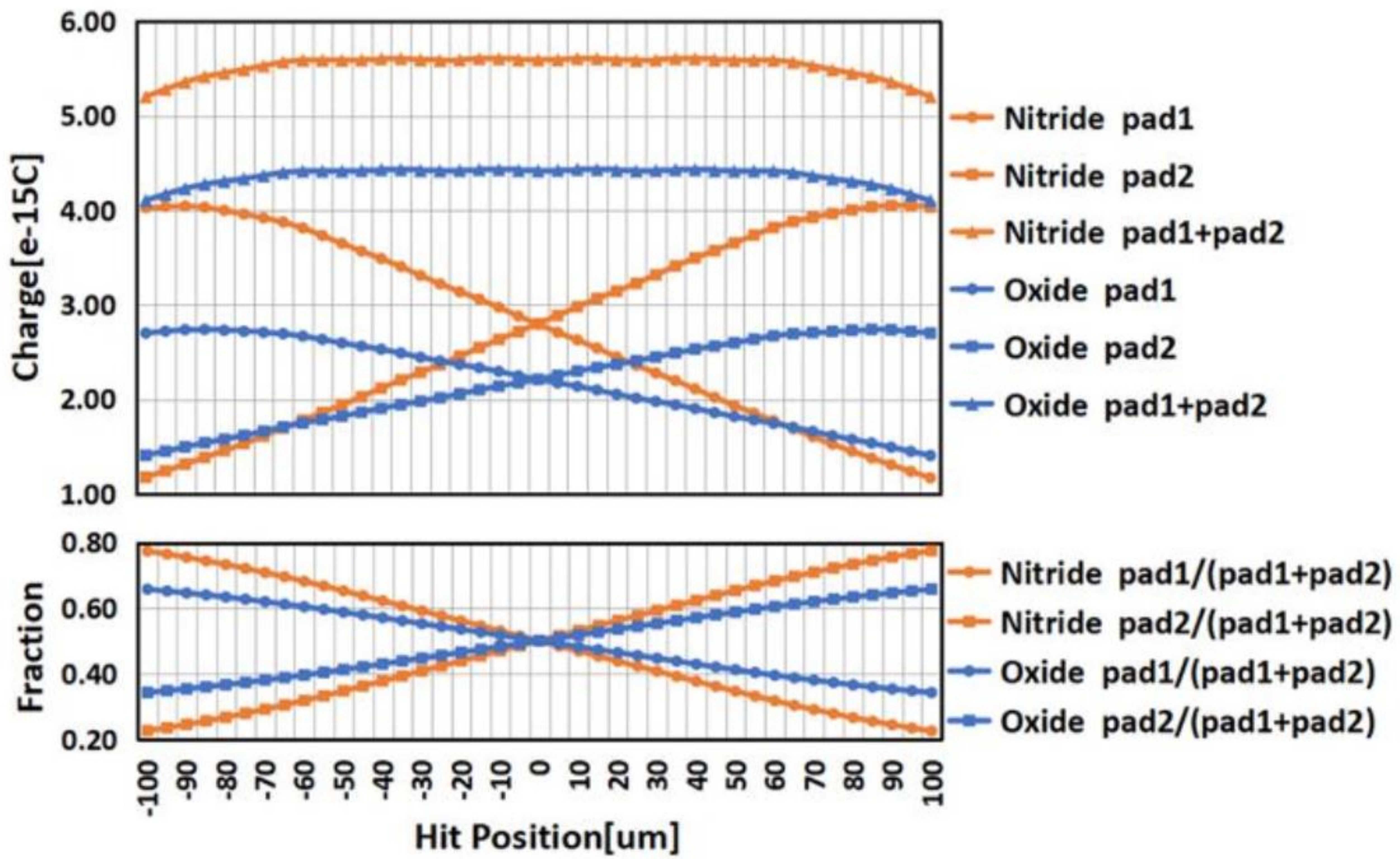


Figure 5.36: Charge collection of two neighboring pads (pad1 and pad2) as functions of hit position for two different dielectric materials: oxide (blue curve) and nitride (orange curve).

- Several Figures in Chapter 5 have bad quality, although they are in pdf format. Likely the pdf was created from another poor quality format. Fix if possible.

Chapter 9 - Muons

Comments based on version from 2025-07-25 at 11:07 am

- Several plots are jpegs or screenshots converted into pdf, so the quality is lower than what one requires for a publication
- Plots in general didn't follow the suggested macro, and in particular, they are missing the "CECP Ref TDR" label
- All captions should end with a "."

Modified

Not modified

Chapter 09

Modified

Not modified

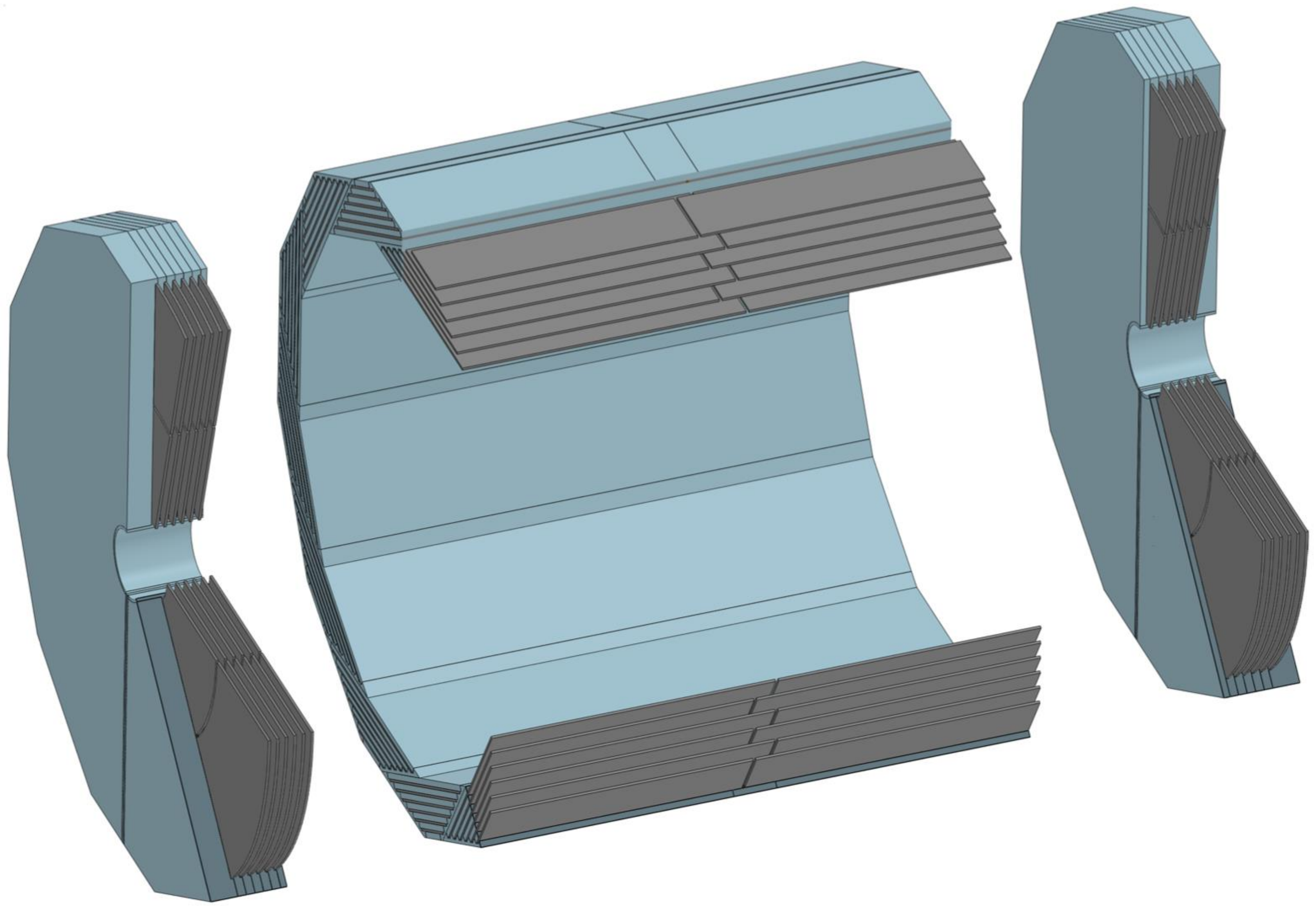


Figure 9.1: Overall view of the the muon detector. It is composed of a dodecagonal barrel and two four-sector endcaps. Its layered assembly alternates between dark gray detector layers and sky-blue iron plates. Each detector layer comprises a pair of detector modules separated by a reinforcing structural stiffener.

- Caption: what it means “four-sector” endcaps? What are these sectors?
  - Missing the number of muon chamber layers
  - Suggestion to add this sentence: The muon chambers (dark gray) are incorporated into six layer inside the iron yoke (sky blue). instead of the sentence “Its layered assembly…. “

Chapter 09

Modified

Not modified

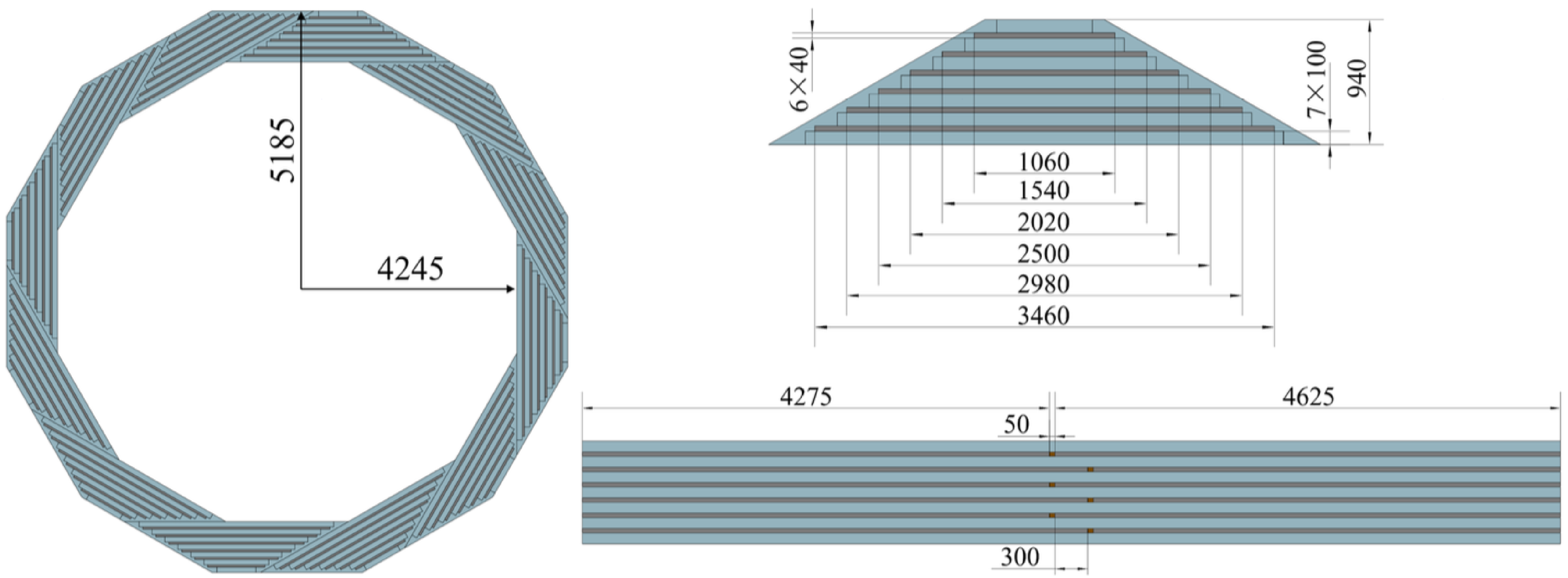


Figure 9.2: (Left) geometric configuration of the barrel muon detector viewed along axial direction. A dodecagonal structure and the arrangement of modules within it are visible. (Right) a trapezoidal dodecant features six super-layers. The unit in the schematic is mm.

- Should split the picture into (a) and (b), instead of left and right.
- Need to figure out how to call these shapes:
  - Regular dodecagon: 12 sides all of the same size
  - Isosceles trapezoid shape: has two parallel sides, and equal angles
  - A trapezoidal dodecant is not a real thing
- Caption: (a) Barrel yoke structure with six super-layers of integrated muon detectors viewed axially. The full yoke structure has a regular dodecagonal configuration made of long elements with an isosceles trapezoid transversal shape. (b) Transversal and longitudinal views of the yoke elements containing the muon muon detectors.

Chapter 09

Modified

Not modified

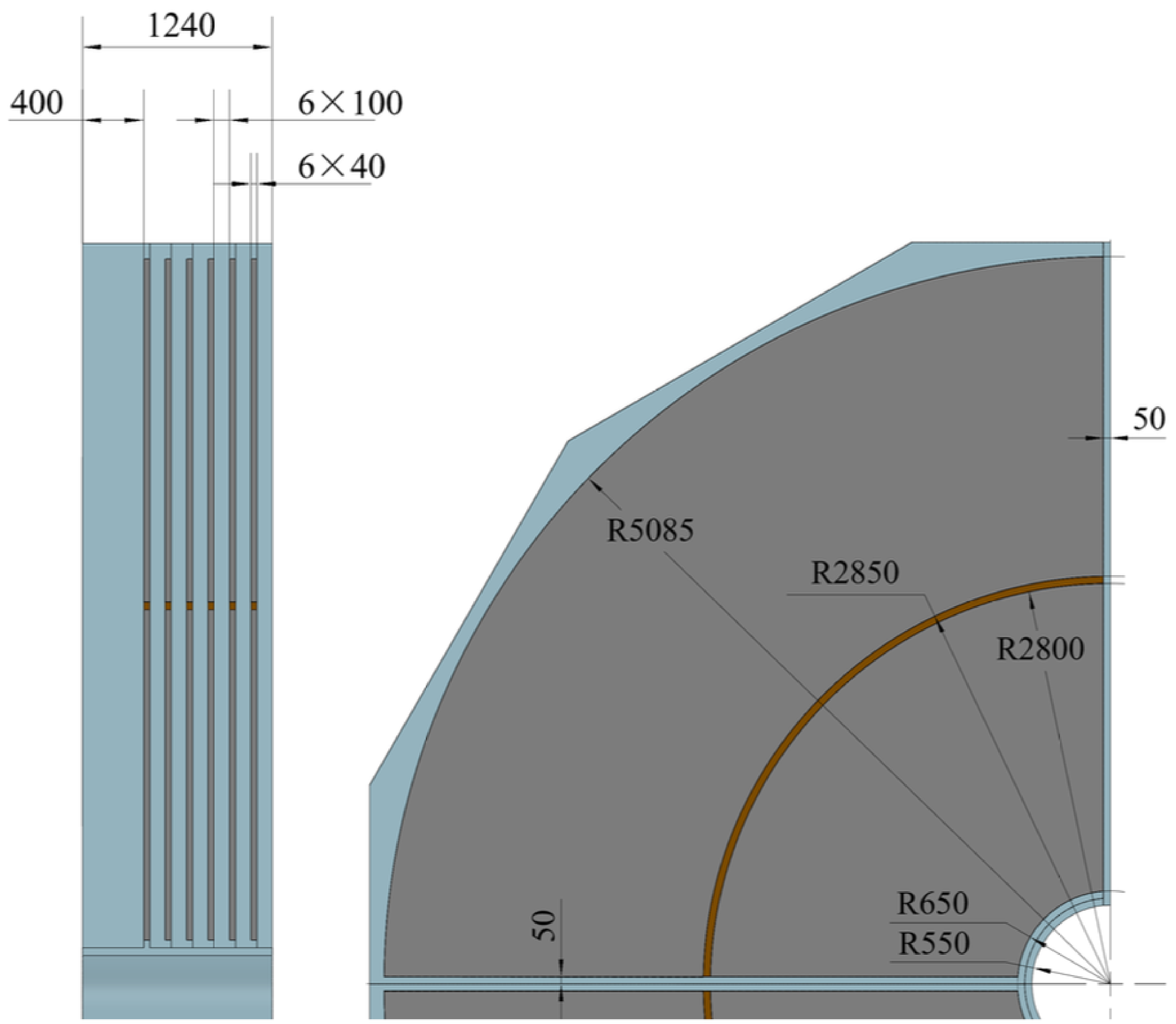


Figure 9.3: Geometric configuration of an endcap muon detector, featuring the arrangement of inner and outer modules and the placement of cable windows.

- Should split the picture into (a) and (b), or carefully construct caption.
  - Perfectly circular muon detector modules are not realistic. This cannot be our proposal for the TDR.
  - Caption is not clear regarding what is inner and outer and what are cable windows… Not sure what is being referred to.

Chapter 10 - Magnet

- Several plots are jpegs or screenshots converted into pdf, so the quality is lower than what one requires for a publication
- Plots in general didn't follow the suggested macro, and in particular, they are missing the "CECP Ref TDR" label
- All captions should end with a "."

Modified

Not modified

Chapter 10

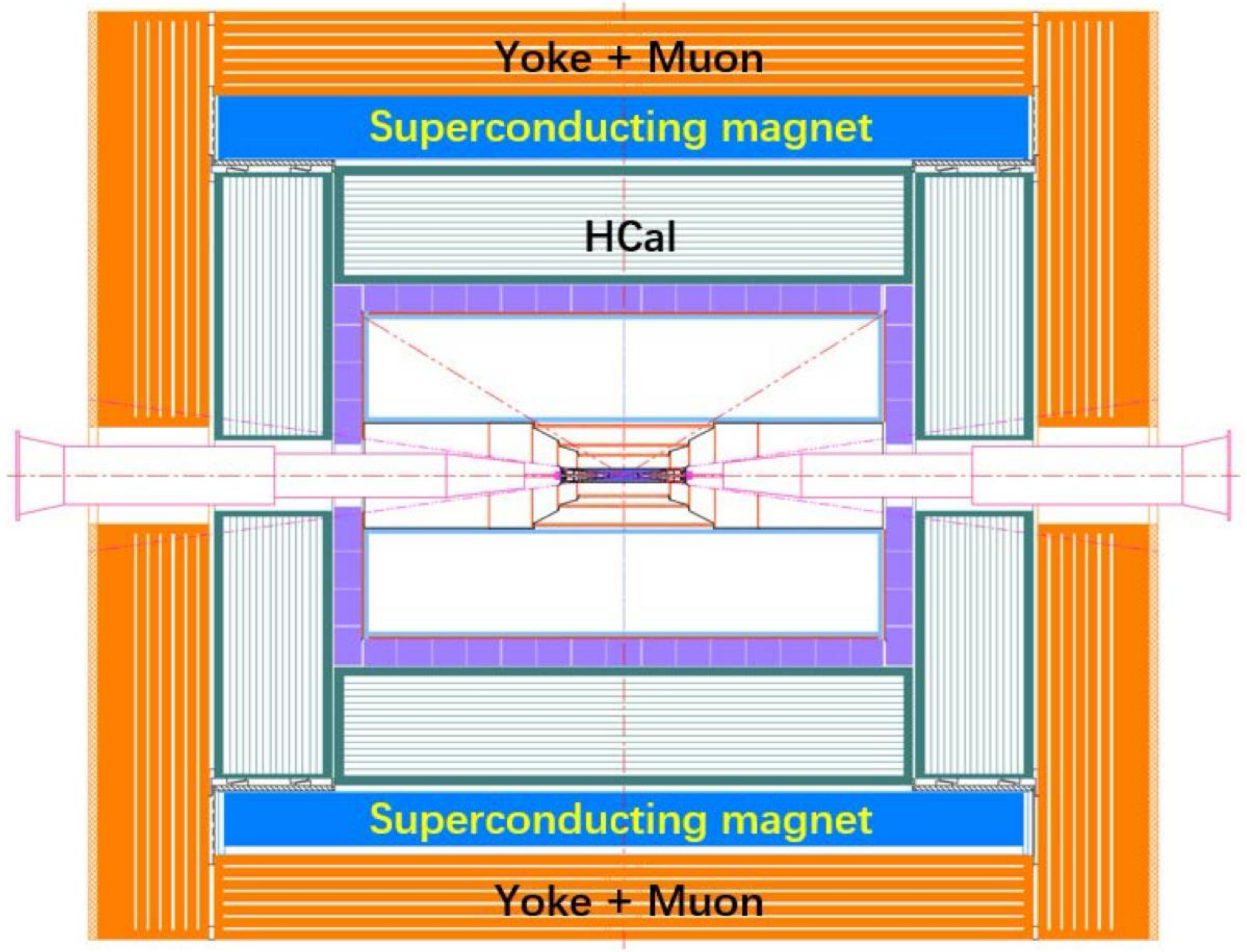


Figure 10.1: The layout of detector. The detector magnet locates between the Hadronic Calorimeter and the yoke. It uses a large solenoid structure.

Modified

- No real needed giving Figure 10.2 and prior versions of this plot
- Diagram has paraffin layer outside of iron yoke
- Caption: needs English improvement. Mention the solenoid and the return yoke

Chapter 10

Modified

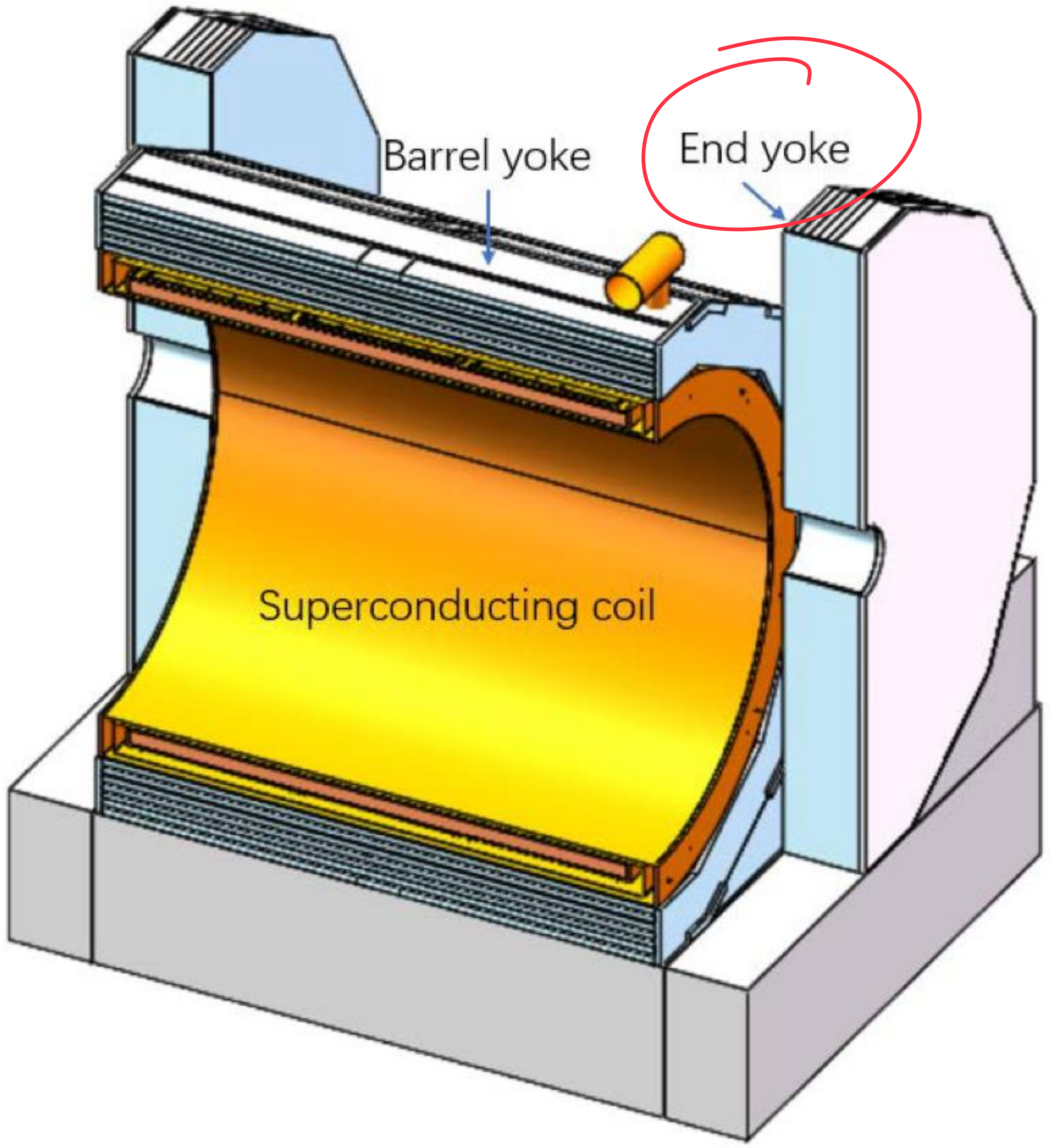


Figure 10.2: The schematic diagram of the magnet. The yoke adopts a dodecahedron structure. The barrel yoke is designed as a spiral structure.

- Diagram has paraffin layer outside of iron yoke. End yoke should be "Endcap yoke".
- No need for previous figure, if we have this one
- Caption: No need to mention the spiral structure since it cannot be seen in this diagram. An interesting aspect in this figure is the presence of the chimney. Something should be said about it.

Chapter 10

Modified

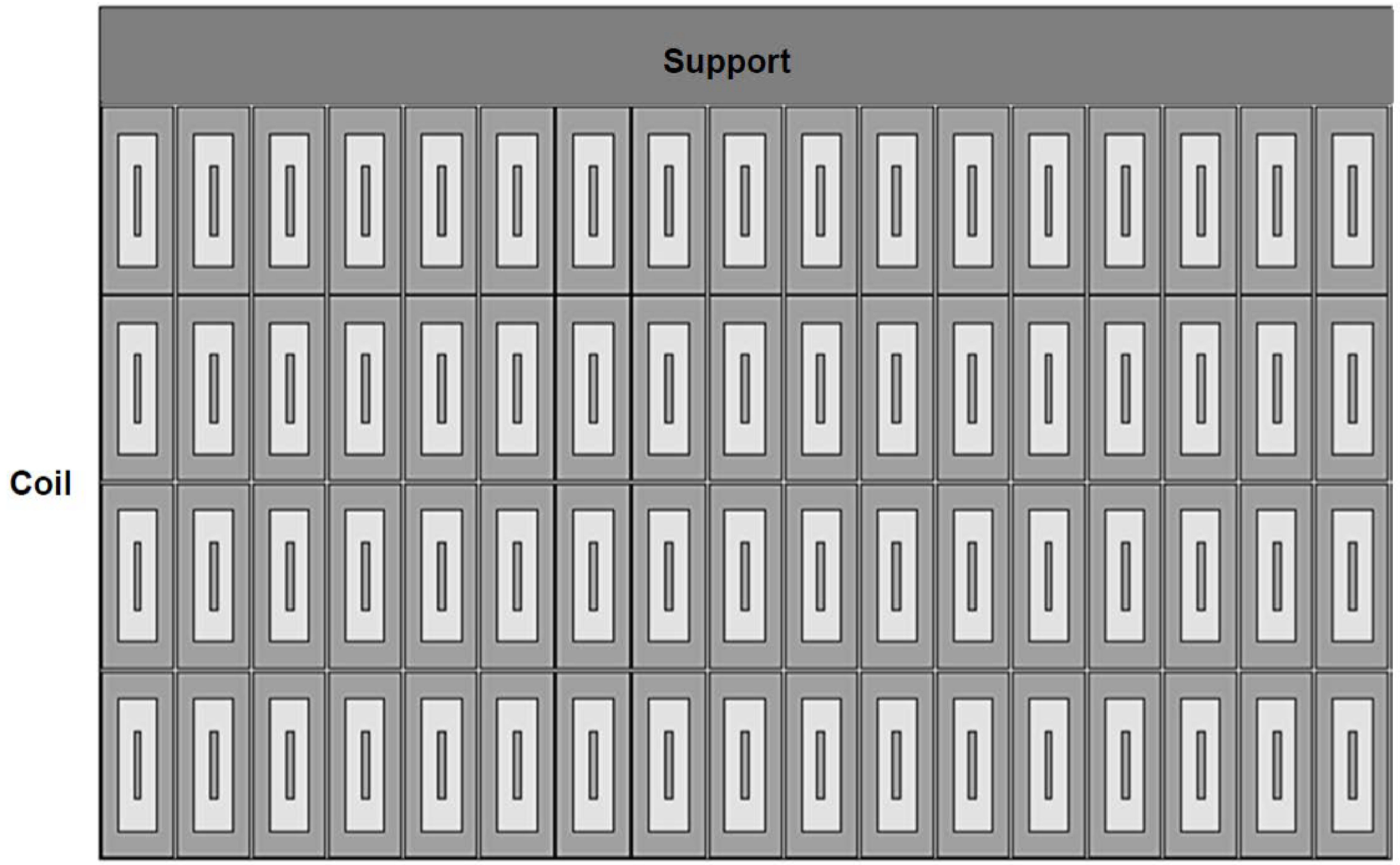


Figure 10.4: The structure of the coil includes the cable, support cylinder and insulation.

- Caption should explain what we are seeing. These are four layers of superconducting cable, installed inside the support cylinder. Where is the insulation? Reference the discussion of the cable details in the future pages

Chapter 10

Modified

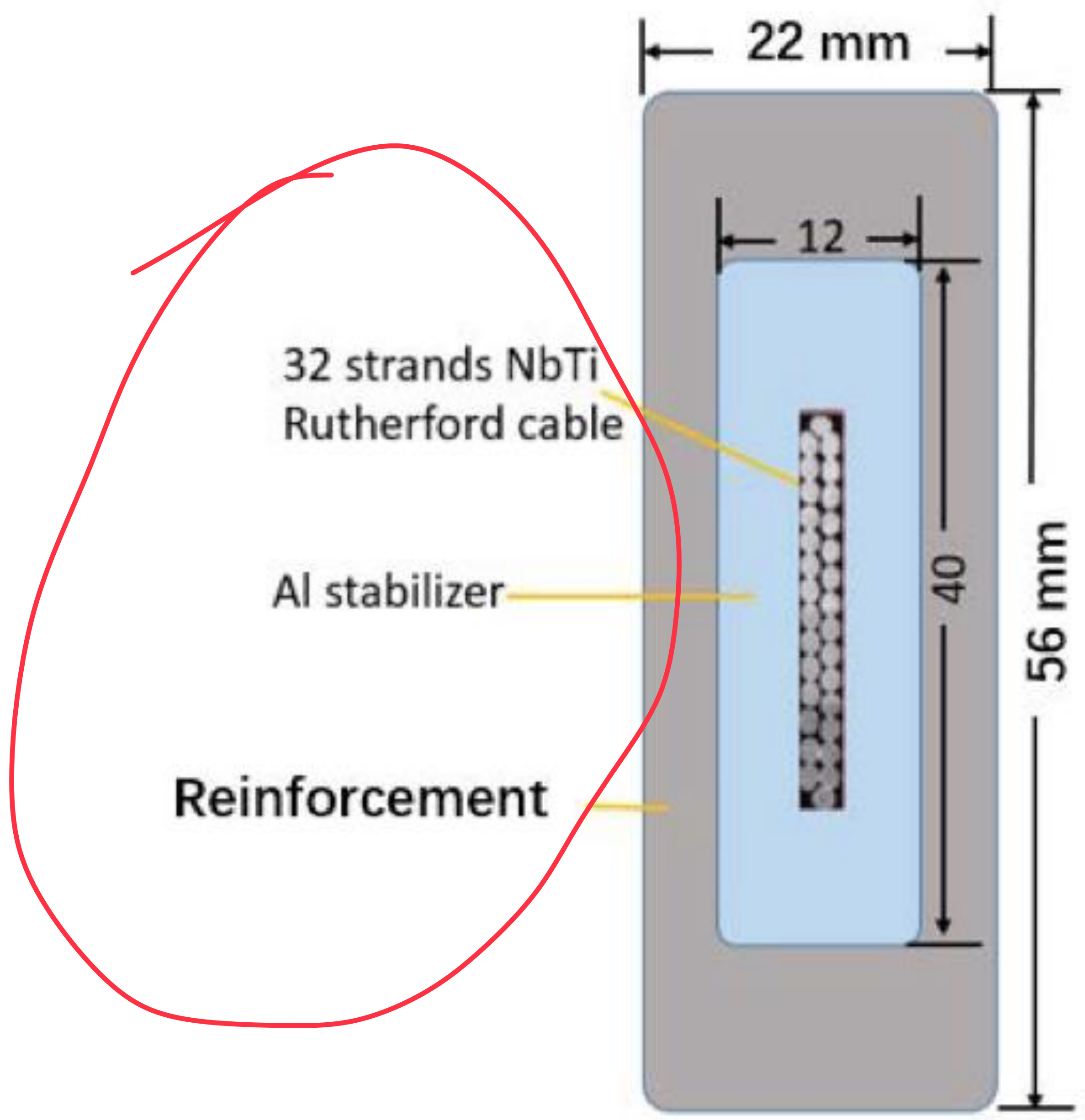


Figure 10.5: Cross section of aluminum stabilized superconductor used in detector magnet. The box-structured aluminum stabilized superconducting conductor consists of three components: the Rutherford NbTi cable, the aluminum stabilizer and the aluminum alloy reinforcement, and it will be obtained by dual extrusion process.

- Font should be the same for all text. Why use bold font for the reinforcement?
- Caption: good, although a little English improvement needed

Chapter 10

Modified

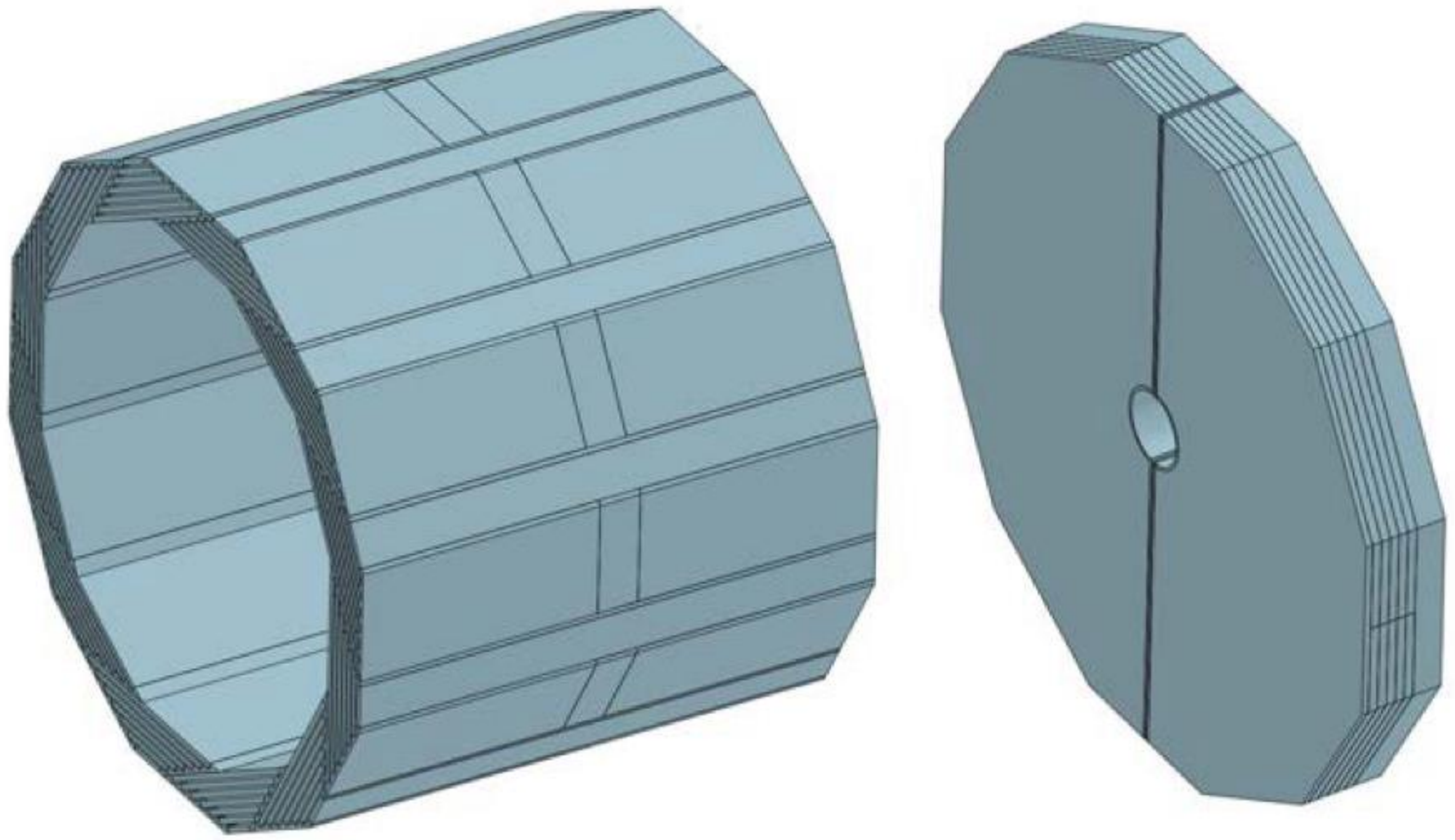


Figure 10.7: The structure of barrel yoke and endcap yoke.The barrel yoke structure is a dodecagonal structure with a modular design. The barrel yoke consists of 12 modules. Each module has six layers of 40 mm clearance space reserved for installing MUC detectors. The module iron layer plates width decreases from the inside to the outside of the barrel yoke. The endcap yoke consists of two half-endcap yokes that can be opened from the middle. This allows easy access to the internal sub-detectors for inspection and maintenance.

- Figure not needed in the magnet chapter. It should be in the mechanics.
- Caption: good, but i believe we have 24 yoke modules, organized in 12 sectors. No need to use acronym MUC

Chapter 10

Modified

Not modified

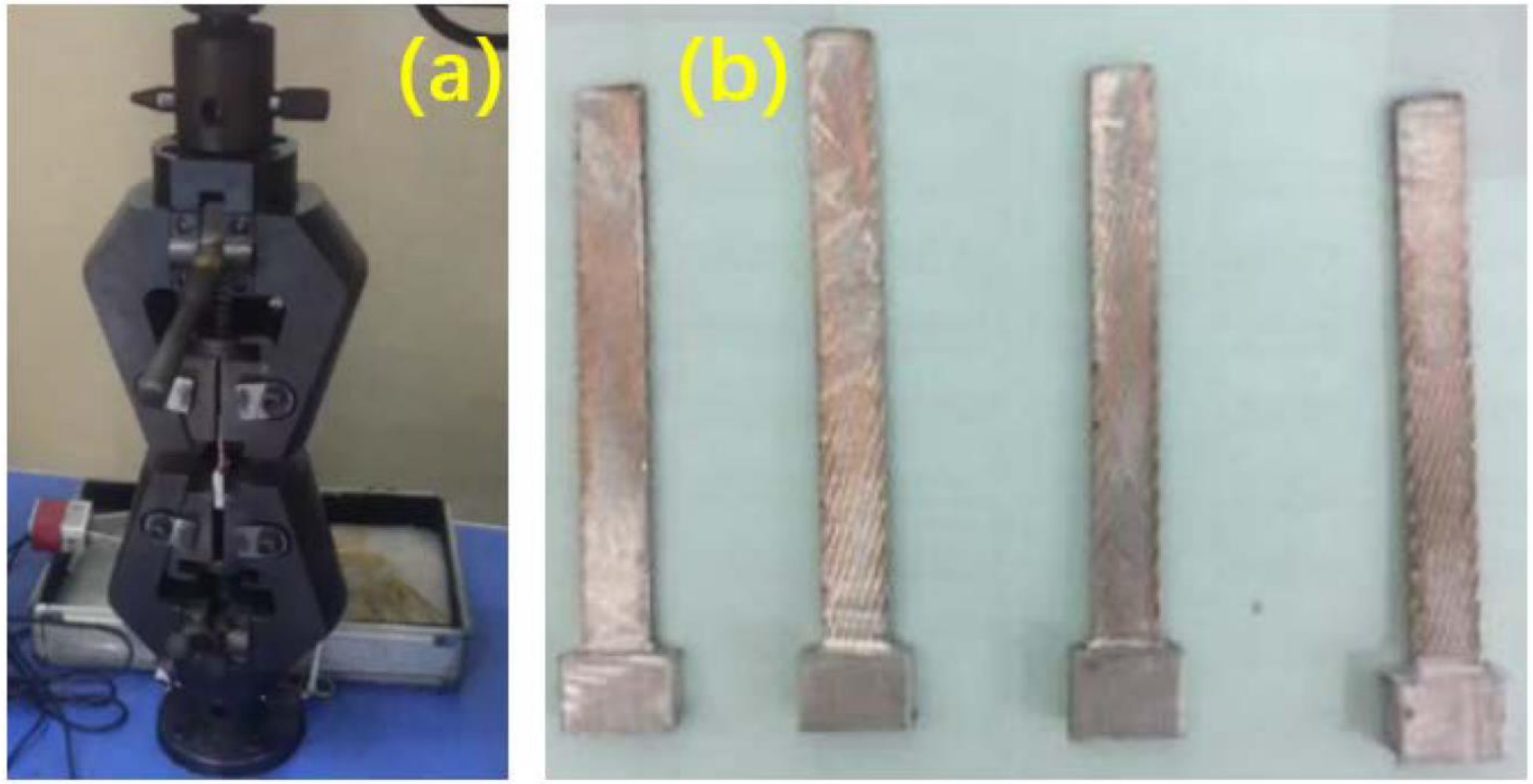


Figure 10.9: (a) AET-20K microcomputer-controlled electronic testing machine (b) 4 samples of shearing test

- Use (a) and (b) in latex, if possible. See macro from Zhaoru
- Caption: Need to explain better the overall test, then how this machine works and what we see in those samples. What is the relevance of AET-20K. Do people know what this means? 20k has a meaning? Knowing the shear forces, or some description of what we see on the samples would be useful. Is what we see here in this test image good, or not?

Chapter 10

Modified

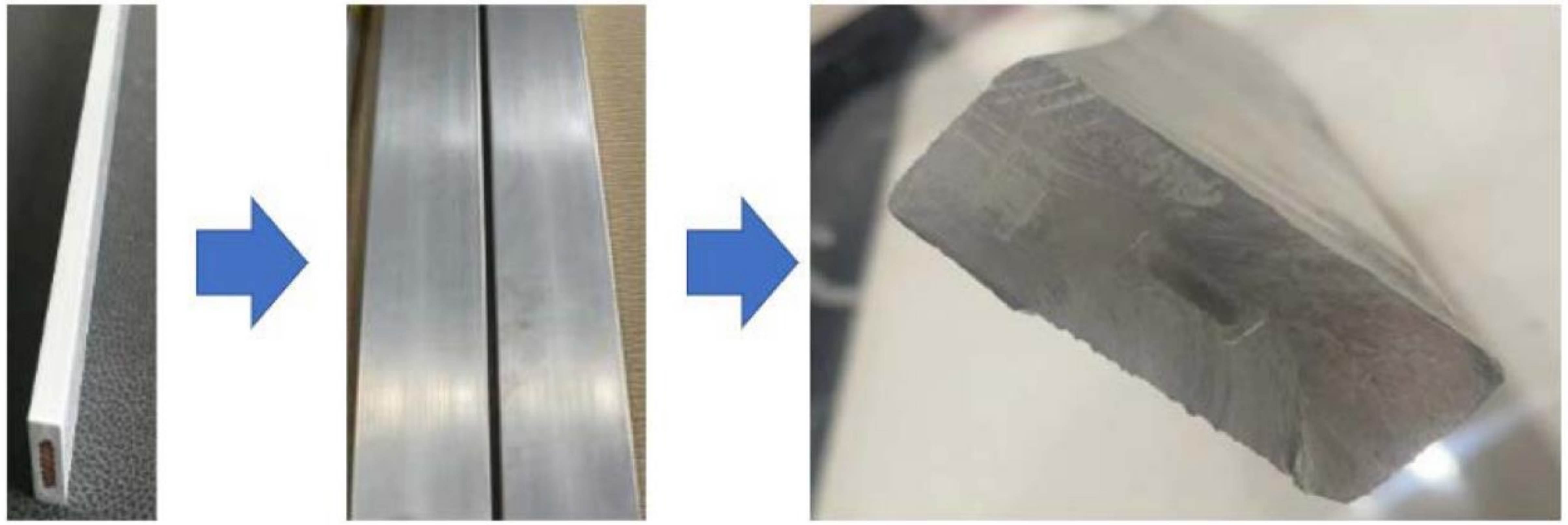


Figure 10.11: Second co-extrusion process. (a) The aluminum stabilized cable 4.7 mm × 15 mm as the insert ; (b) Dummy conductor with Al alloy 6061 and copper cable 56 mm × 22 mm; (c) Box configuration type conductor with pure aluminum and aluminum stabilized cable 56 mm × 22 mm.

- Add (a), (b), (c) to the figure, now the caption mentions it but there is no a,b,c. Could also consider it one single figure since you have the arrows. Then, the caption should not mention a, b, c. You could say the the co-extrusion process is shown from left to the right.
- The middle figure is not understandable. What is the line in the middle? These are two pieces of raw aluminum?

Chapter 10

Modified

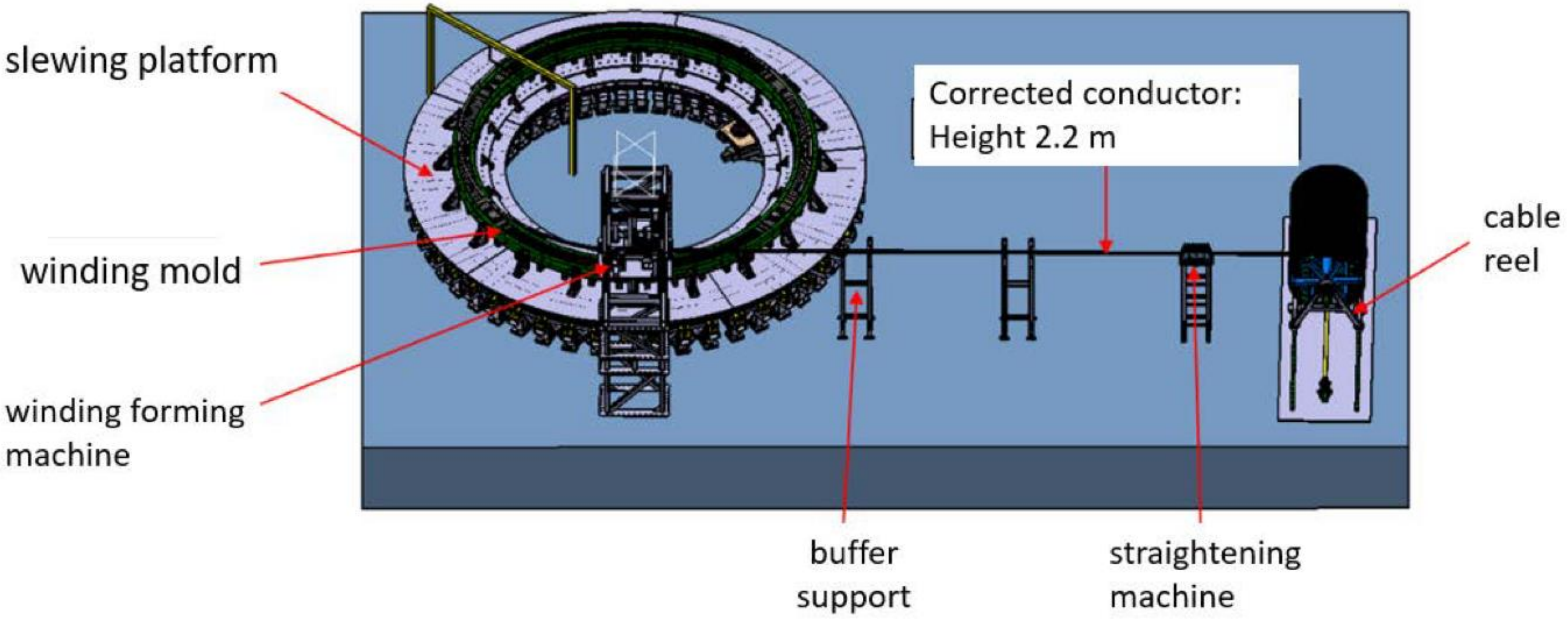


Figure 10.12: The diagram of the winding line

- Usually you should capitalize the first letter of each term in the legend
- Caption: What does "line" stand for? production line? or the conductor?

Chapter 10

Modified

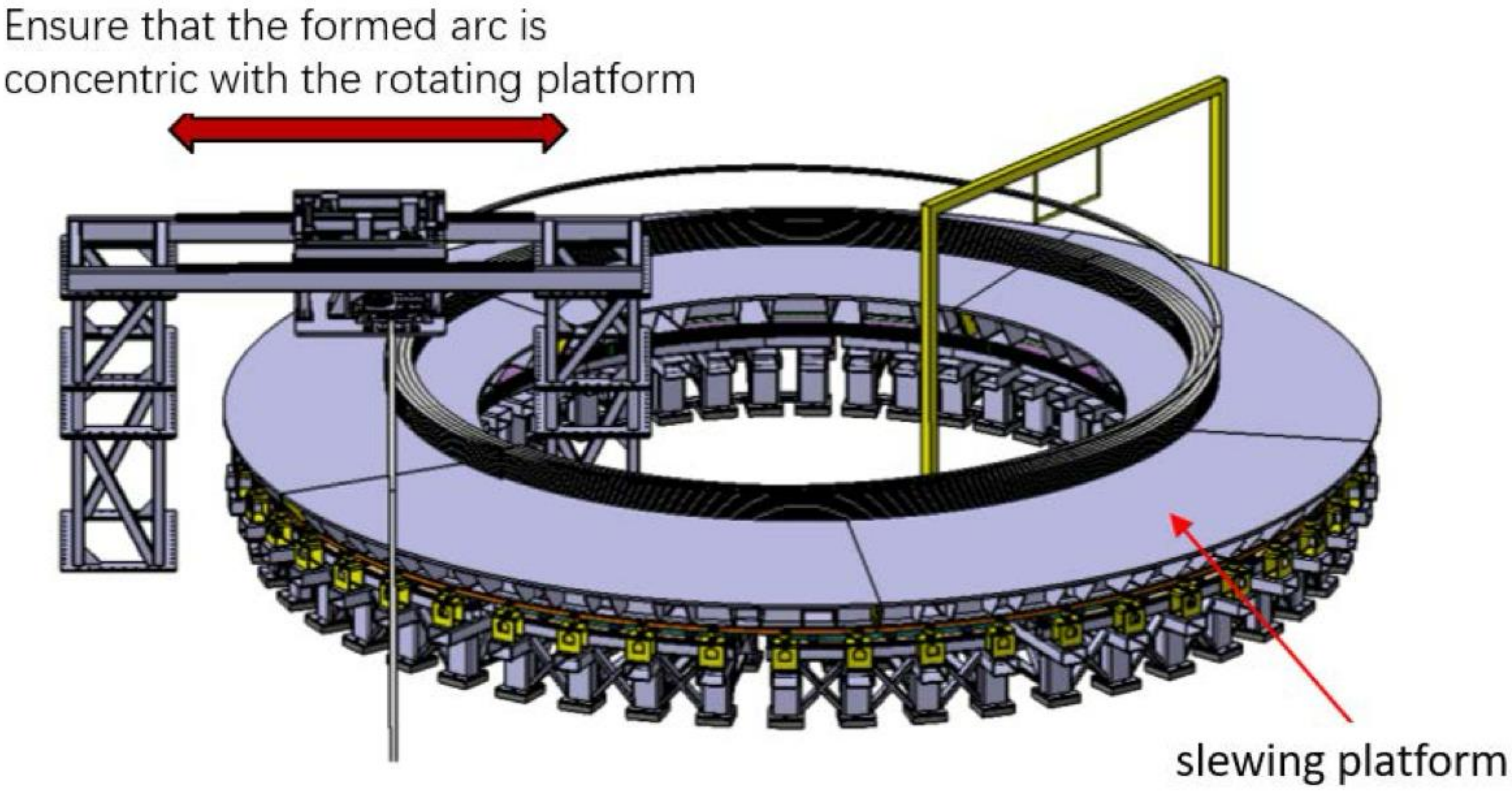


Figure 10.13: Winding table

- Capitalize "Slewing platform" if done in the previous picture as well
- This figure is just a detail from the previous one. It only makes sense to include, if some text is written about it. Is the dummy support cylinder included here? Say something about the procedure

Chapter 10

Modified

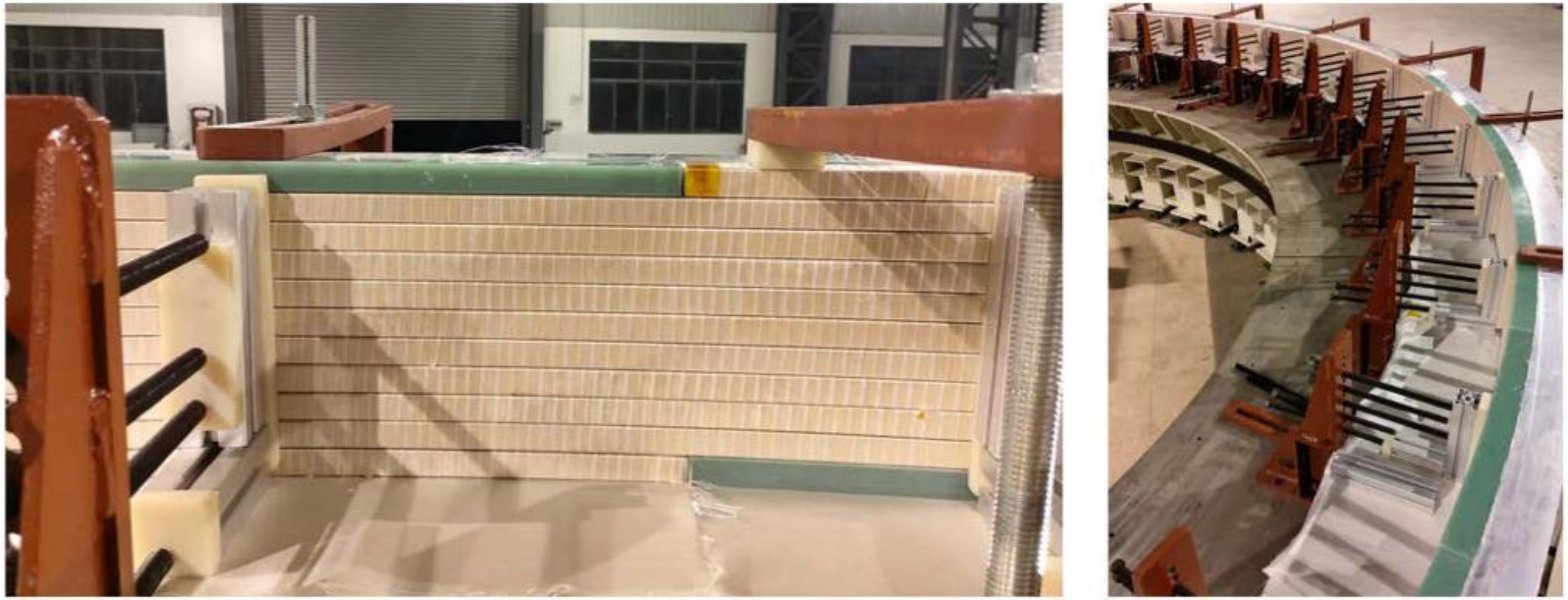


Figure 10.14: Axial and radial clamping fixtures

- Really very poor caption. Not clear at all what this is. These are sampling fixtures for what? The coil? or this is part of the platform? Explain in caption and/or text. Right now i have no idea what we are looking at
- Usually we read figures from left to the right. It seems like the right figure is the broader picture, and the right one is a further detail. In such case, you should swap the the two figures.

Chapter 10

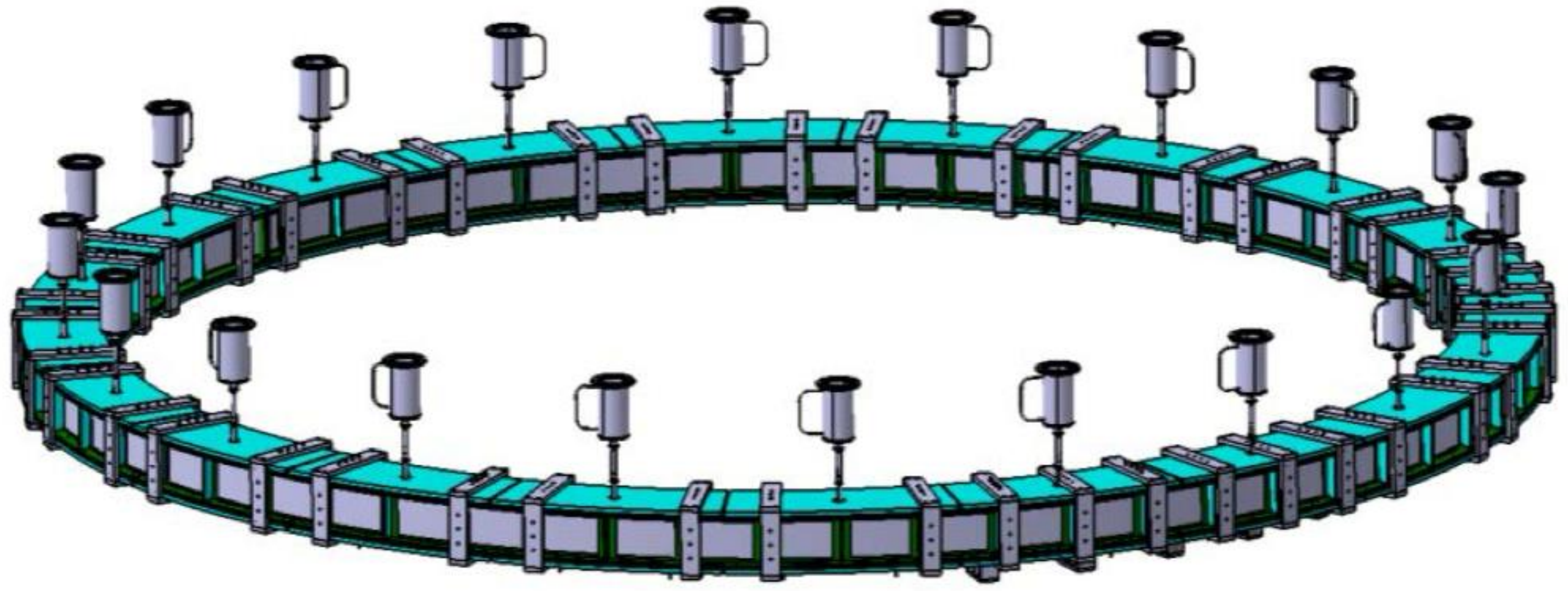


Figure 10.15: Schematic diagram of VPI mold

Modified

Figure 10.16: The Dummy coil after VPI. The inner diameter of the coil is 7.2 m. There are four layer and ten turns each layer.

- Captions are too simple, in particular the one for Fig 10.15. What are we looking at? What are those things on the top?
  Fig 10.16 show a stack of stuff. You should explain it. It is not possible to know what it is, unless one is an expert

Chapter 10

Modified

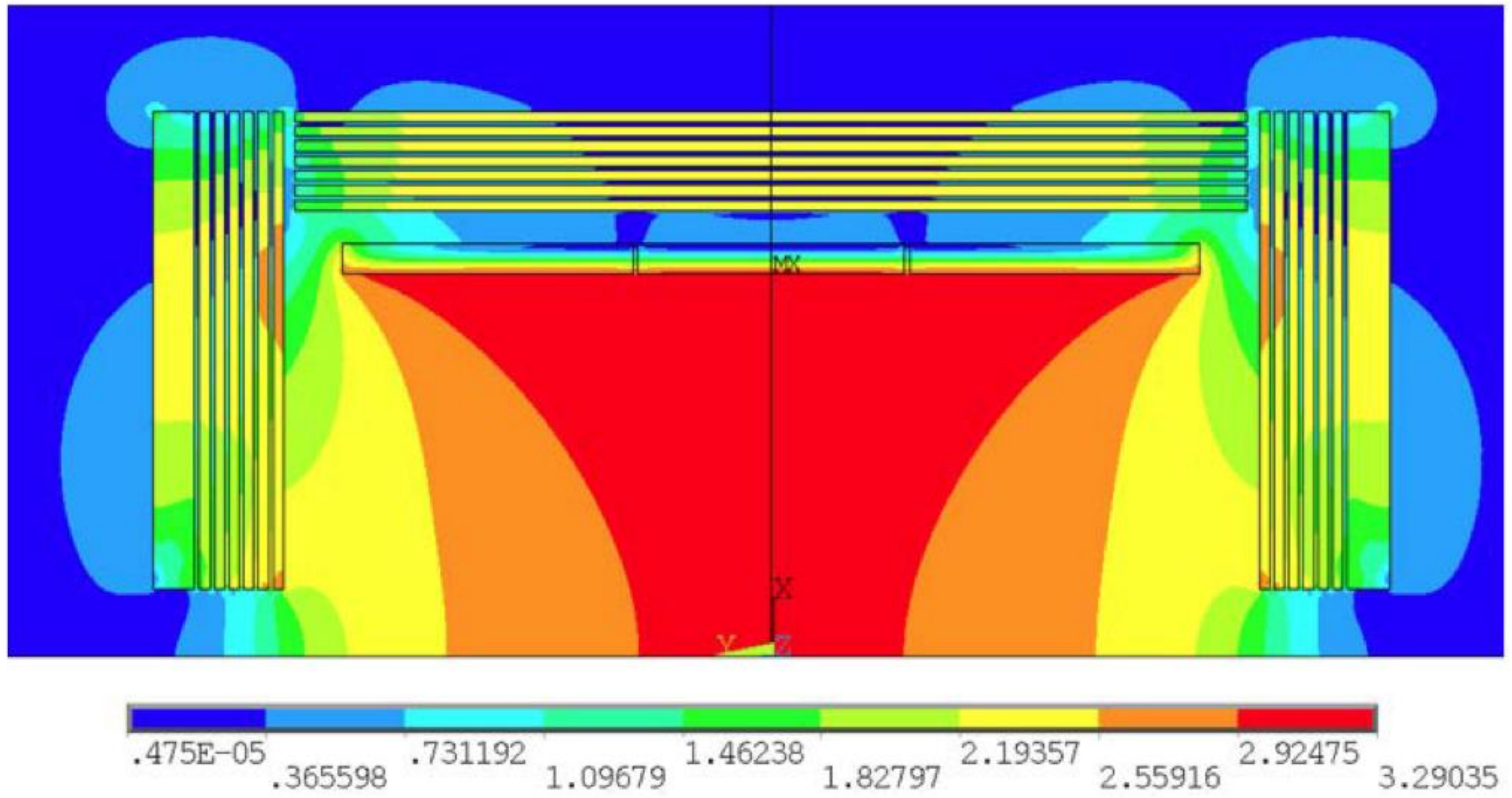


Figure 10.17: Two-dimension Magnetic field distribution of the solenoid. The barrel yoke adopts a symmetrical structure.

- This figure, and several other similar (10.22, 10.24, 10.29, ones still have too many significant figures (digits) in the legend. Three is the maximum needed and it would allow for larger font/numbers.

Chapter 10

Modified

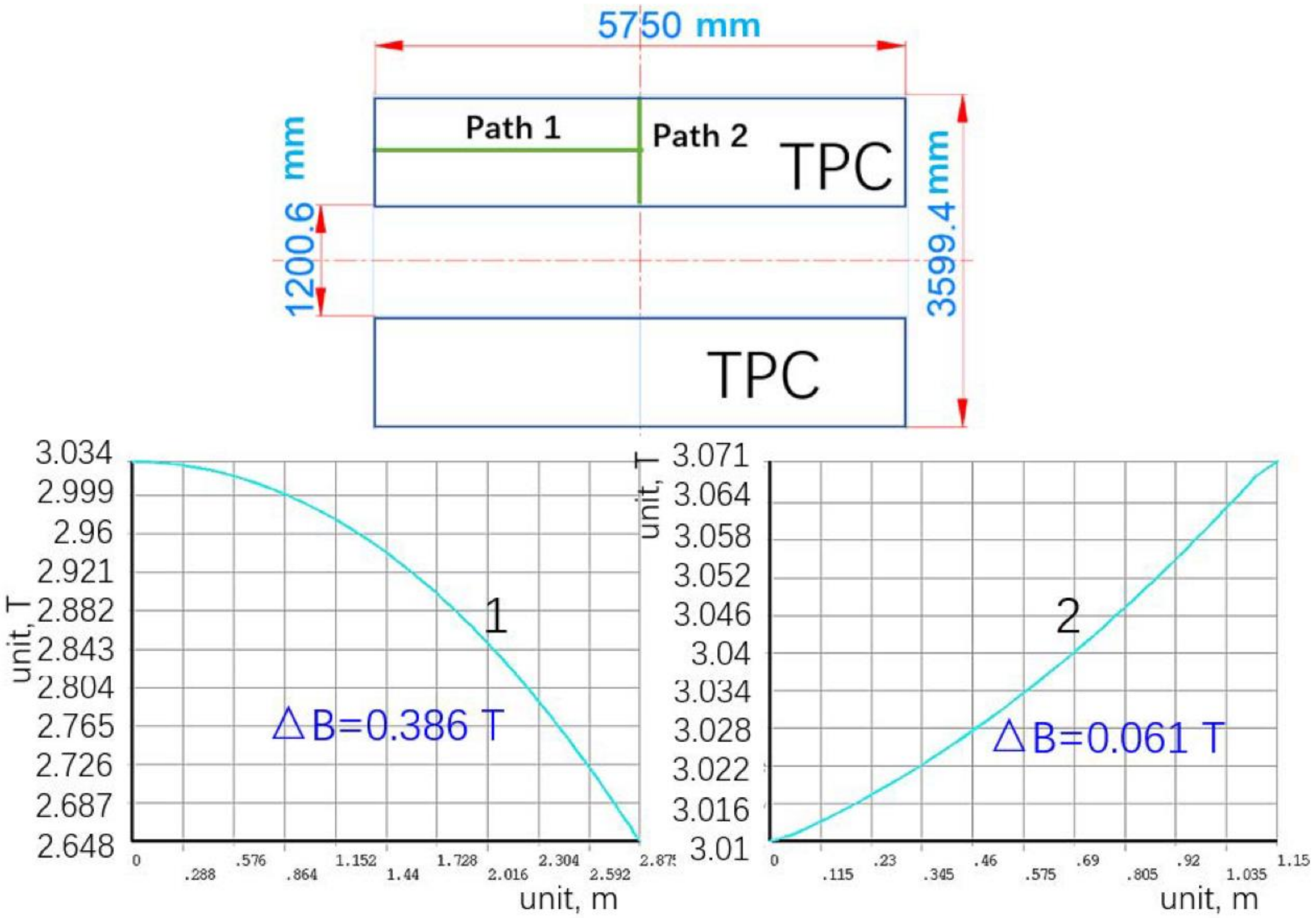


Figure 10.21: The dimensions of TPC. The inner diameter is 1200.6 mm. The outer diameter is 3599.4 mm. Magnetic field distribution on path 1 and path 2. The horizontal axis represents the axial position. The vertical axis represents the magnetic field strength. The magnetic field strength is a relatively uniform distribution with a small gradient.

- The size of the values in the x- and y-axis should be the same. The axis titles should indicate the variable being displayed, not just the units
  - Y-axis is Magnetic Field (T), the X-axis is Distance (m), or something similar

Chapter 10

Modified

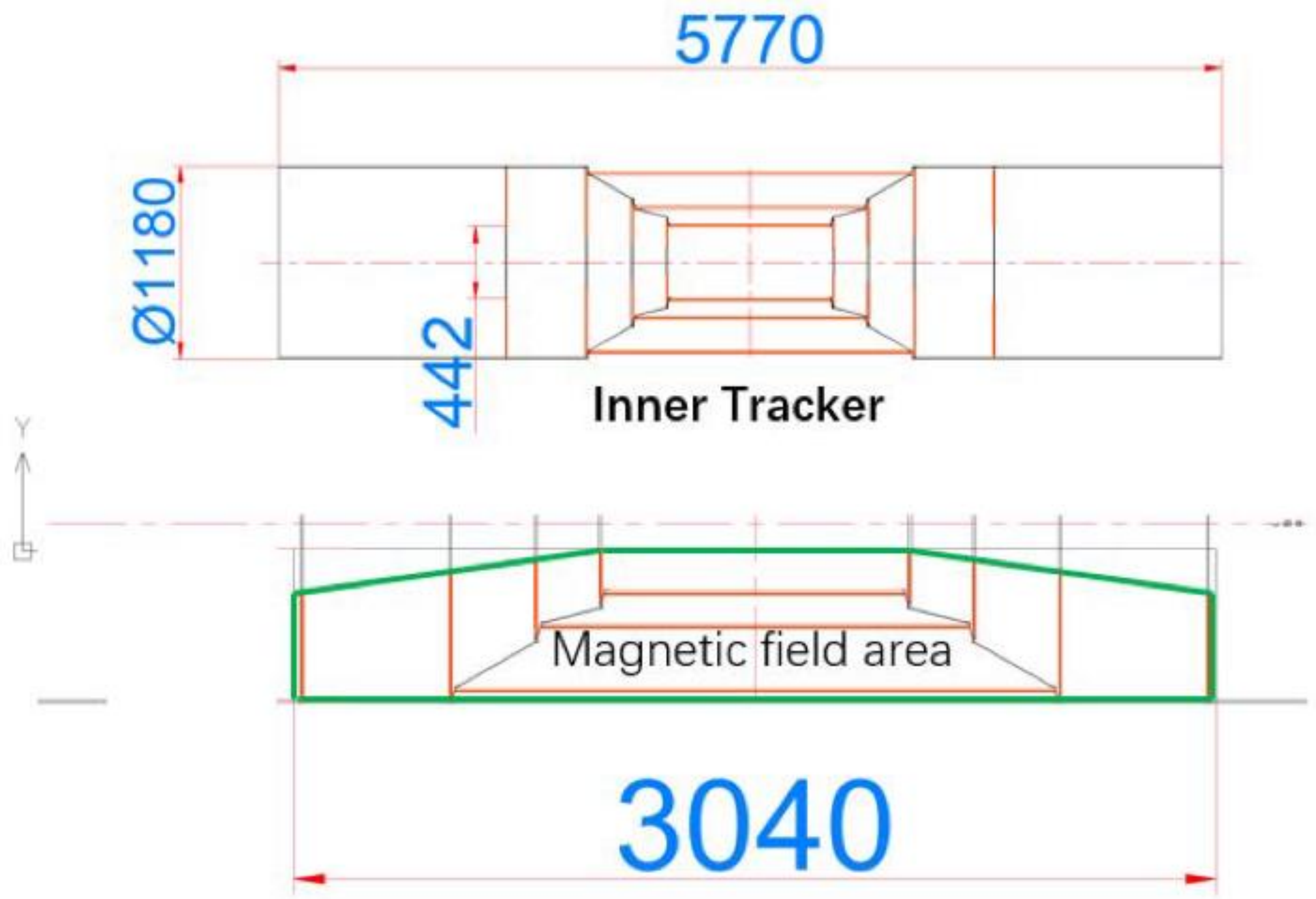
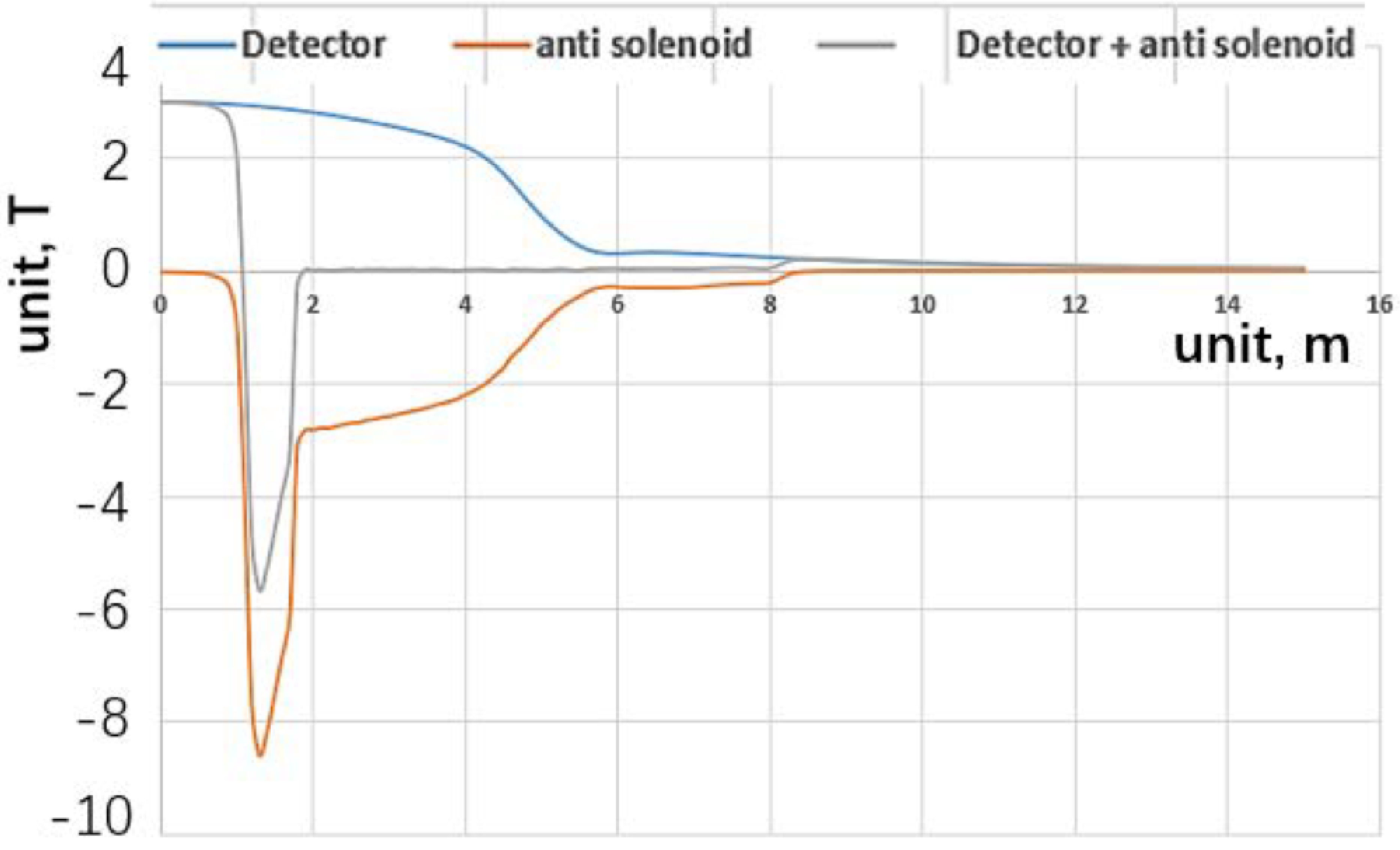


Figure 10.23: The dimensions of the ITK (unit, mm). For simplicity, it has been approximated as a rectangular-like area

- We don't need a figure to indicate the dimensions of the ITk. If I understand correctly, these are two figures (top and bottom), although that is not explained. The dimensions should be in chapter 5 (PLEASE CHECK NOW if it agrees with what you using here). The dimensions could just be put in Fig. 10.24 together with the magnetic field distribution, or mentioned in the text. People will assume that you know the correct dimensions…
    - A rectangular-like shape is not a proper description. That is not a rectangular…. You could say the shape of the green area, and explain why…. i assume it follows the acceptance

Chapter 10

Modified



Combined field

Figure 10.27: Magnetic field distribution combined solenoid and anti-solenoid. The horizontal axis represents the axial position, ranging from the collision point to 16 meters. The vertical axis represents the magnetic field strength with the unit Tesla

- “anti solenoid” in the legend should be capitalized when it shows up by itself
- The axis should have labels, not only units! Y-axis is Magnetic Field (T), the X-axis is Distance (m). Then, the caption adds more information

Chapter 10

Modified

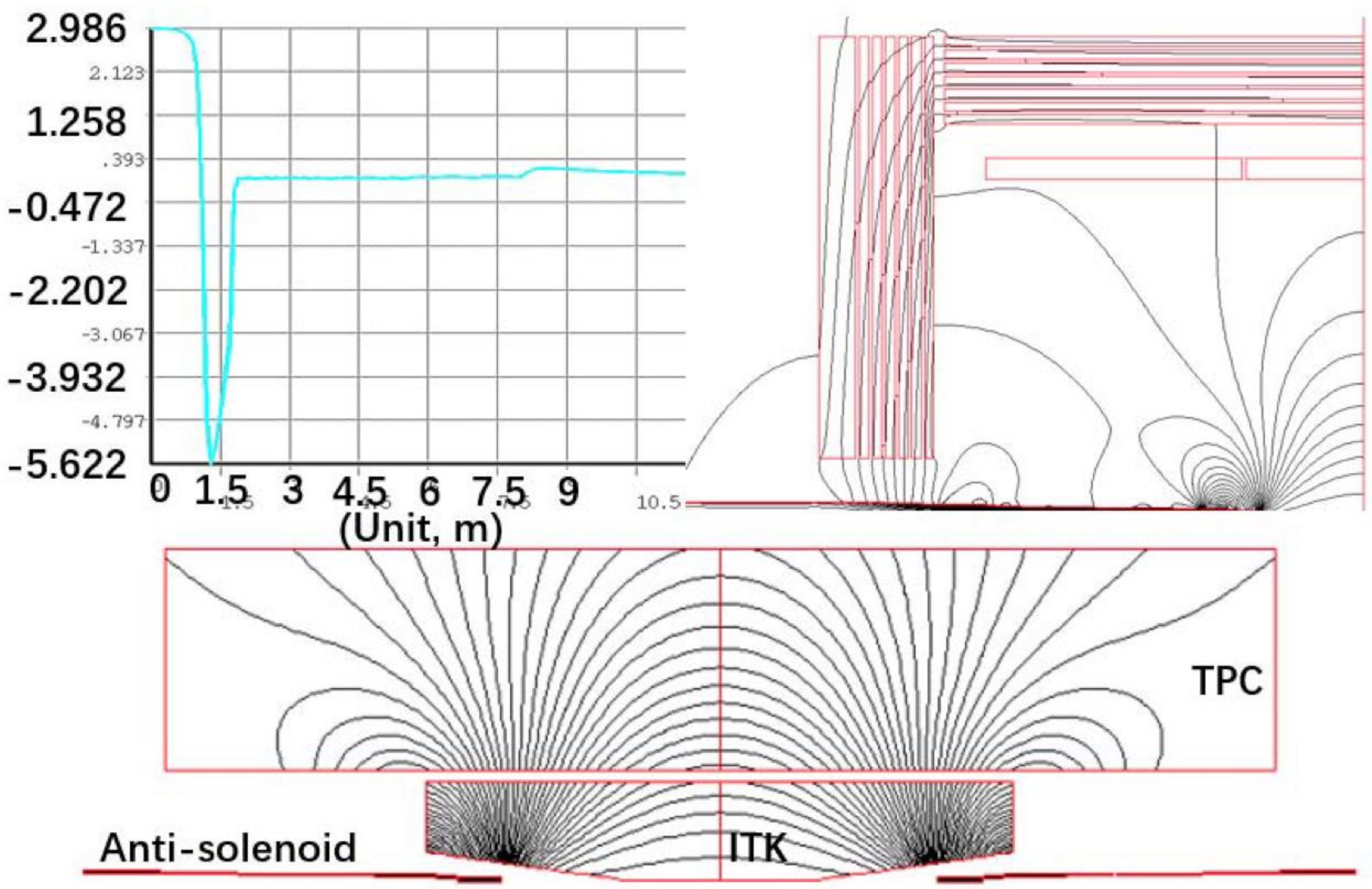


Figure 10.28: Magnetic flux of anti-solenoid and its influence on TPC and ITK. It is the magnetic field distribution of only anti-solenoid, without main solenoid.

- The axis should have labels, not only units! Y-axis is Magnetic Field (T), the X-axis is Distance (m).
- The graph has numbers over numbers, large numbers over small numbers. This is sloppy and should never happen
- The magnetic field in this Figure top left seems to be the total magnetic field, not of only the anti-solenoid, as mentioned in the caption. The total magnetic field is already given in the previous figure, it is not needed to repeat here
- Field lines have no meaning if there are no numbers, you should at least mention what is the scale for the lines in the caption, so that one could judge how uniform is the field
- Caption does not explain the top and bottom diagrams, why the two? The top one is more than the TPC, contrary to the caption

Chapter 10

Modified

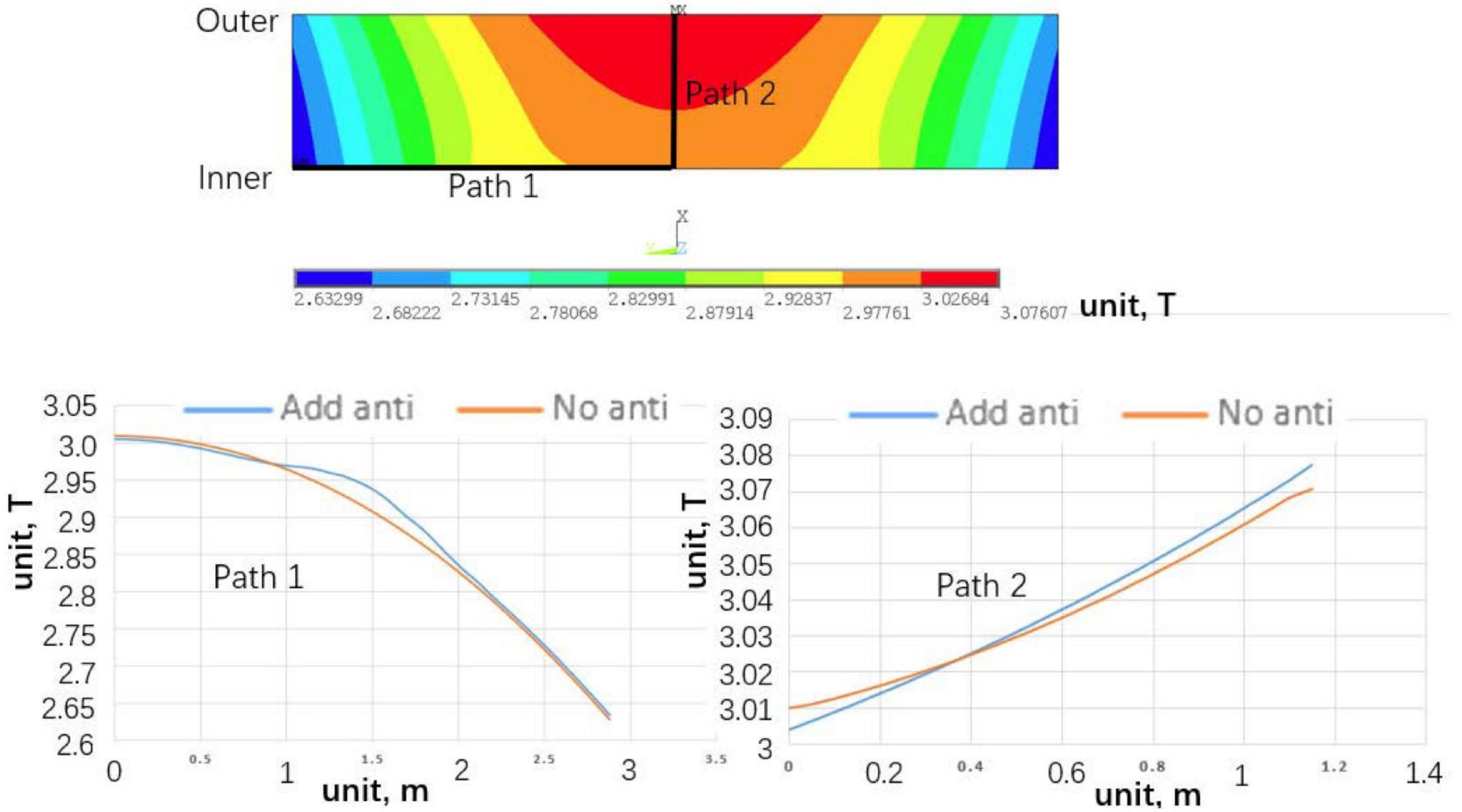


Figure 10.29: The horizontal axis gives the axial coordinate along Path 1 and Path 2; the vertical axis shows the magnetic-field magnitude in Tesla. Comparing the field profiles along the two paths reveals that the anti-solenoid introduces only minor distortions, leaving the TPC field highly homogeneous.

- Display quality of the graphs is very poor. This must be from jpeg or screenshot
  - Graph should not have a mixture of large and small numbers in the axis. The axis labels should not just be the units (as mentioned for other plots)
  - Legend is strange “Add anti” “No anti” has no meaning. In previous plot you used the full name: with anti-solenoid, without anti-solenoid
- Caption does not describe the top plot, only the bottom two.
- Information here seems to be very similar to Fig 10.28. Dimensions for the top plot should be provided. I see a coordinate axis in the top plot, but no numbers

Chapter 10

Modified

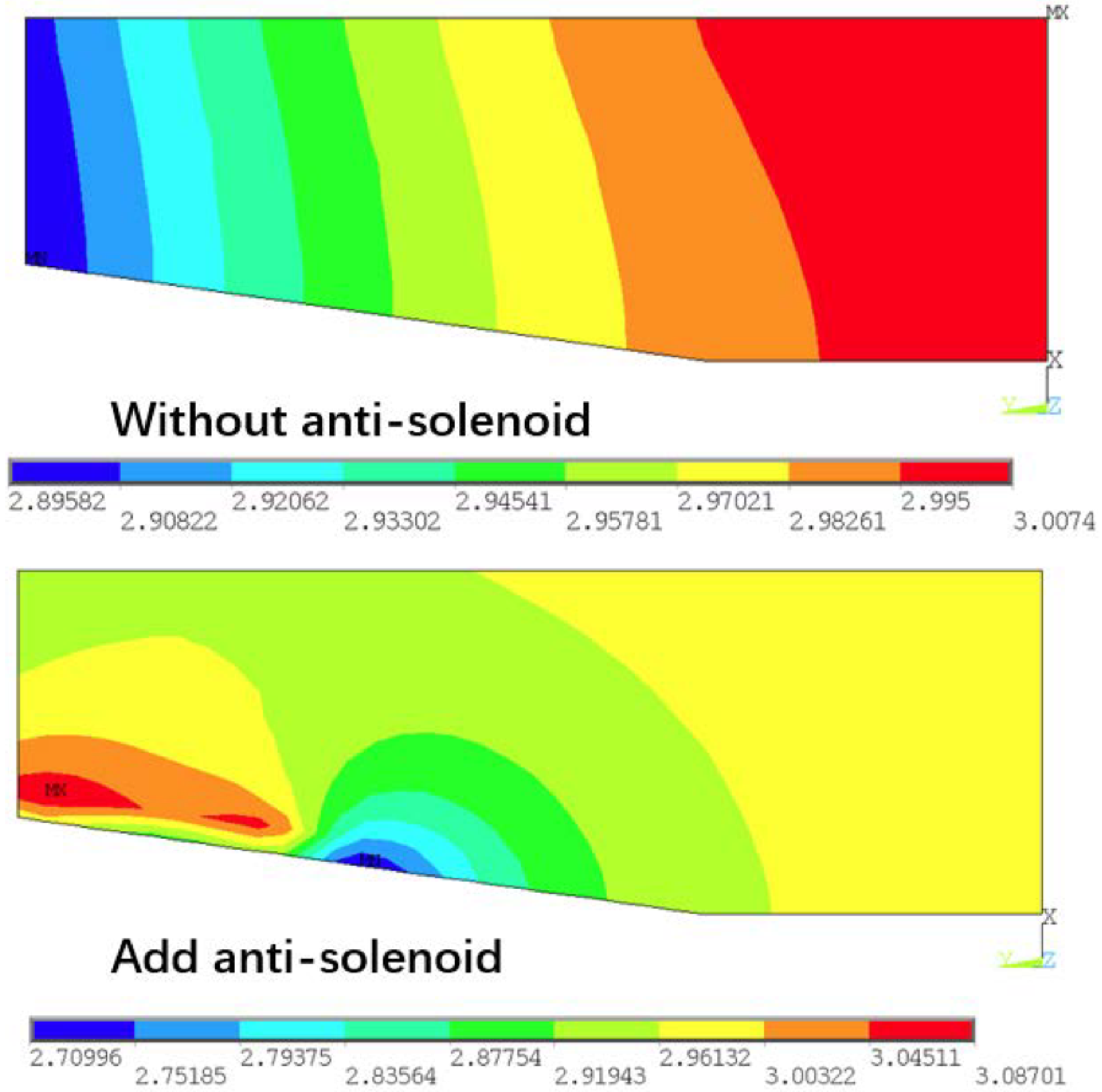


Figure 10.30: Comparison of the magnetic field distribution in the ITK region caused by the anti-solenoid. Owing to the close proximity of the anti-solenoid to the ITK, its magnetic field exerts a significantly stronger influence there.

- This is a good plot, but we should indicate the dimensions and where the ITk stops and the TPC starts
  - The plots should use (a) and (b) with Latex, and the caption should describe both properly. It is incorrect. The plot is not the comparison of the anti-solenoid field. I believe the top plot shows the field of the detector solenoid, and the bottom the total field after the anti-solenoid is taking into account.

Chapter 10

Modified

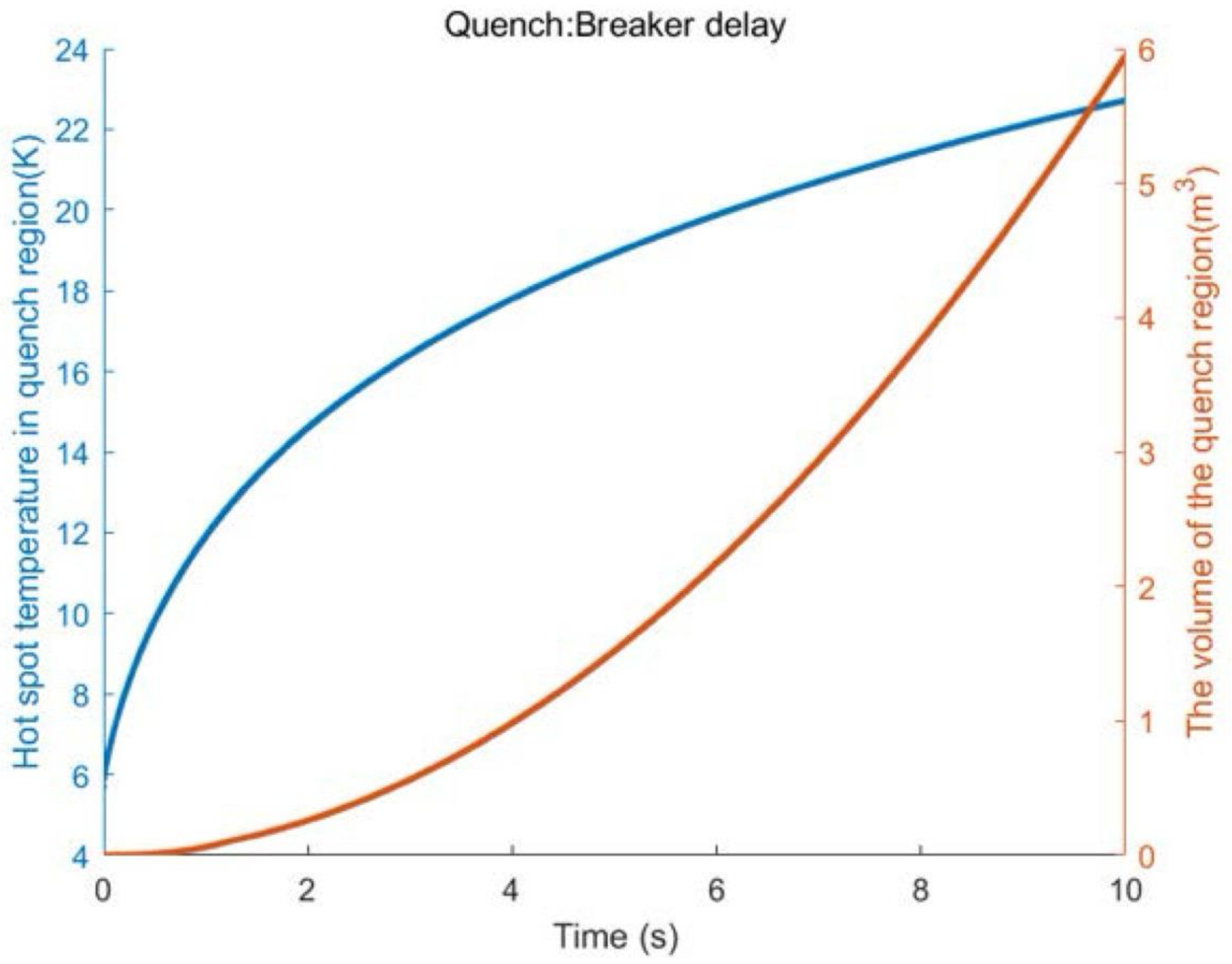


Figure 10.32: The hots pot temperature and the volume of the area affected by quench. The hot spot temperature and the volume of the area affected by quench after a local disturbance during the power-off delay period.

- Quality of the plot is not ideal. Still seems to be a screenshot
- No title needed. Information should be in the caption
  - Breaker delay seems to be the meaning of the x-axis, so just move that there, instead of time "Breaker delay time (s)"
  - "hots pot" is a typo
  - Better if "hot spot" was defined

Chapter 10

Modified

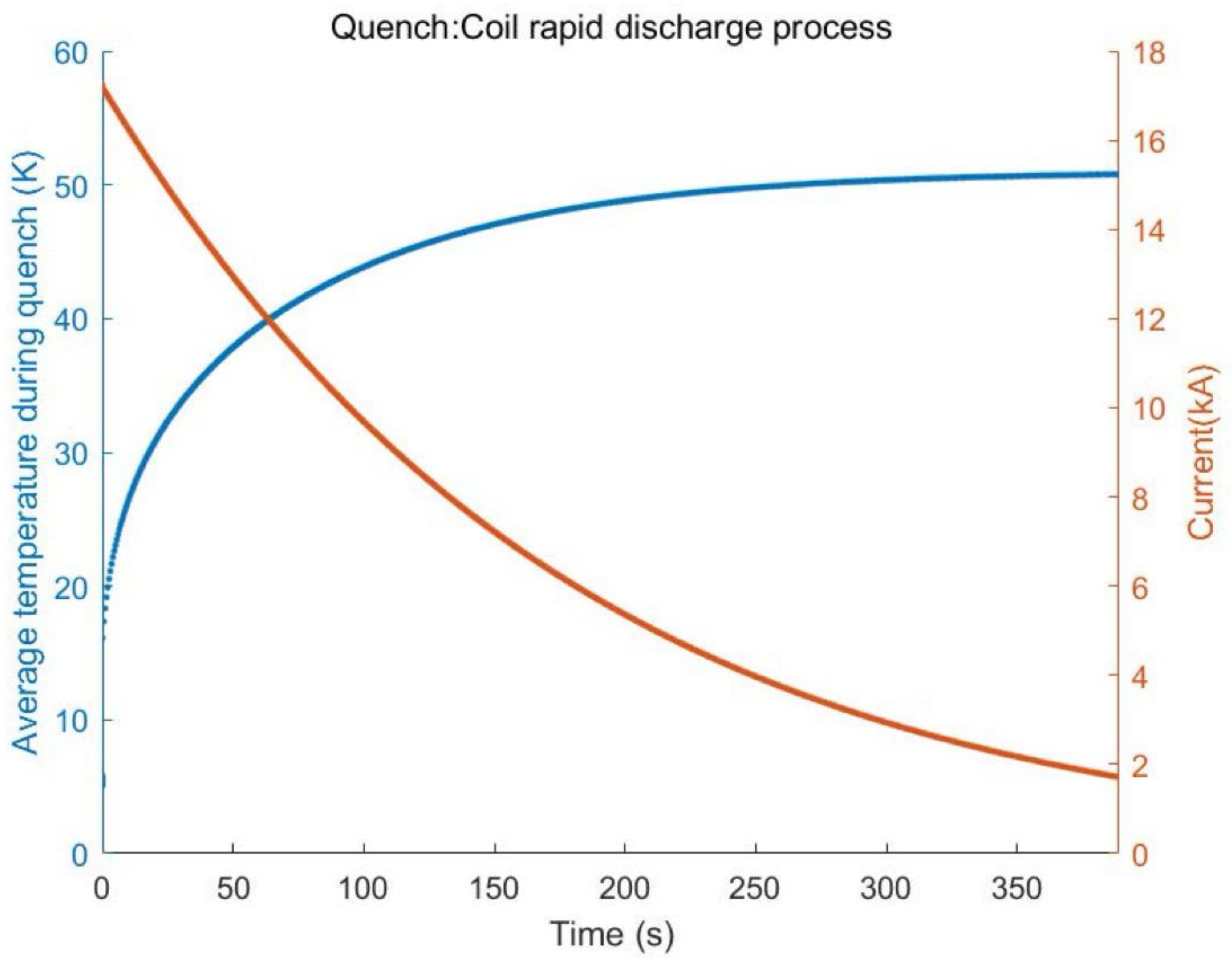


Figure 10.33: Quenching parameters of the coil based on the dump resistor. The decay curve for the coil current and temperature change of the coil based on 50 mΩ dump resistance and a stabilizer RRR value of 700.

- Quality of the plot is not ideal. Still seems to be a screenshot
- No title needed. Information should be in the caption
- First sentence is caption seems incorrect…"based on dump resistor" is not good english. Quenching characteristics seems more correct than parameters. Decay curve is jargon, the curve shows current.
- **Caption suggestion:** Coil conditions during quenching. Coil current during a rapid discharge process through a dump resistor of 50 mOhm and stabilizer RRR value of 700 is shown in yellow. The corresponding coil temperature is also shown.

Chapter 10

Modified

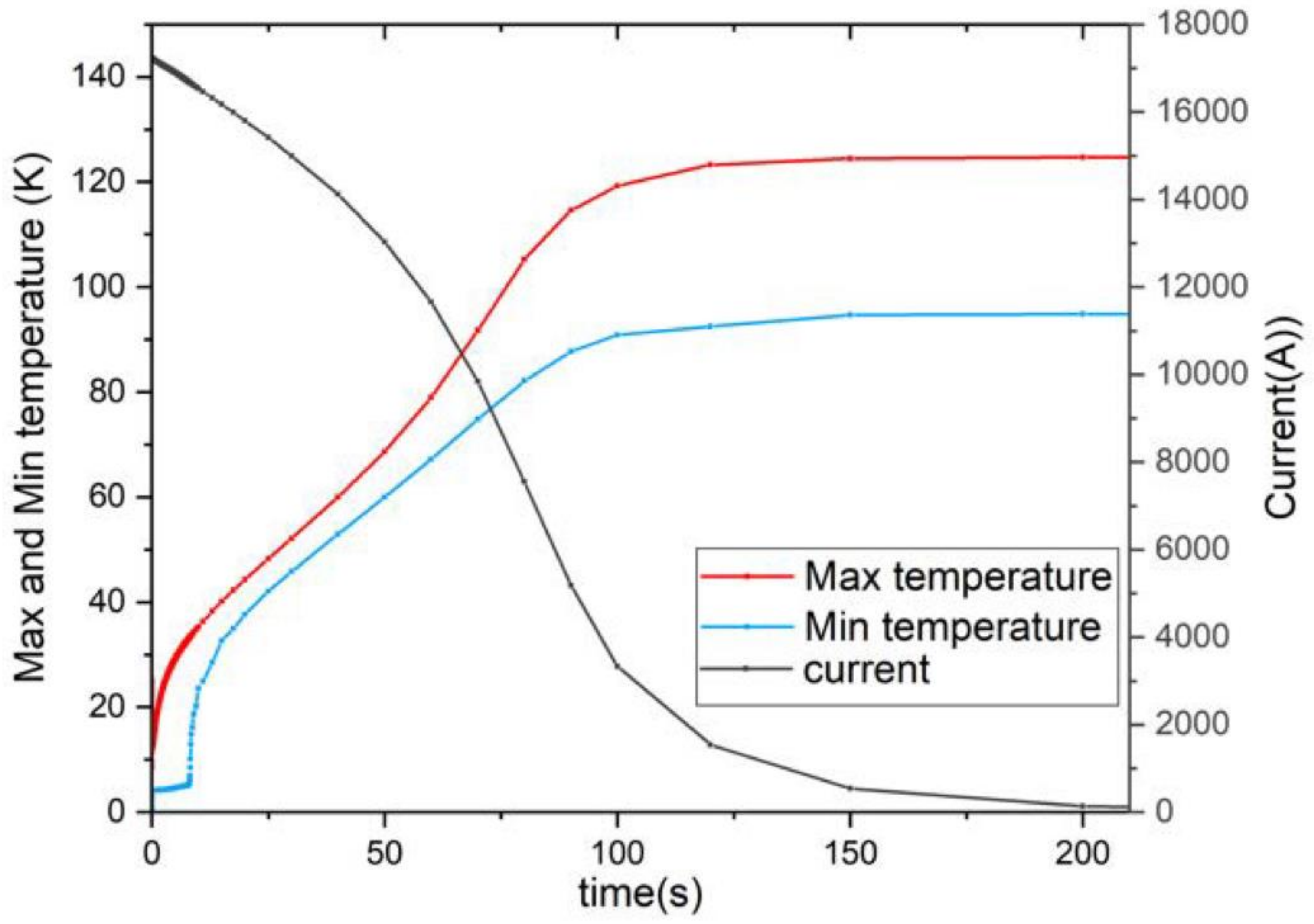


Figure 10.35: The maximum and minimum temperature distributions of the coil under different thermal perturbation energies

- Quality of the plot is not ideal. Still seems to be a screenshot
- Extra ")" in the Current (A) right y-axis: (A)) should be (A)
- The left y-axis should say only "Temperature (K)", not "Max and Min Temperature" that goes in the legend
- Time should be capitalized in the x-axis
- Current should be capitalized in the legend
- Caption: The plot includes the current in addition to the temperature. That should be mentioned in the caption as well. What does it mean "under different thermal perturbation energies?" This is the result of the simulation of one specific quench, right? The difference of temperature refers to locations in the coil, according to the text.

Chapter 10

Modified

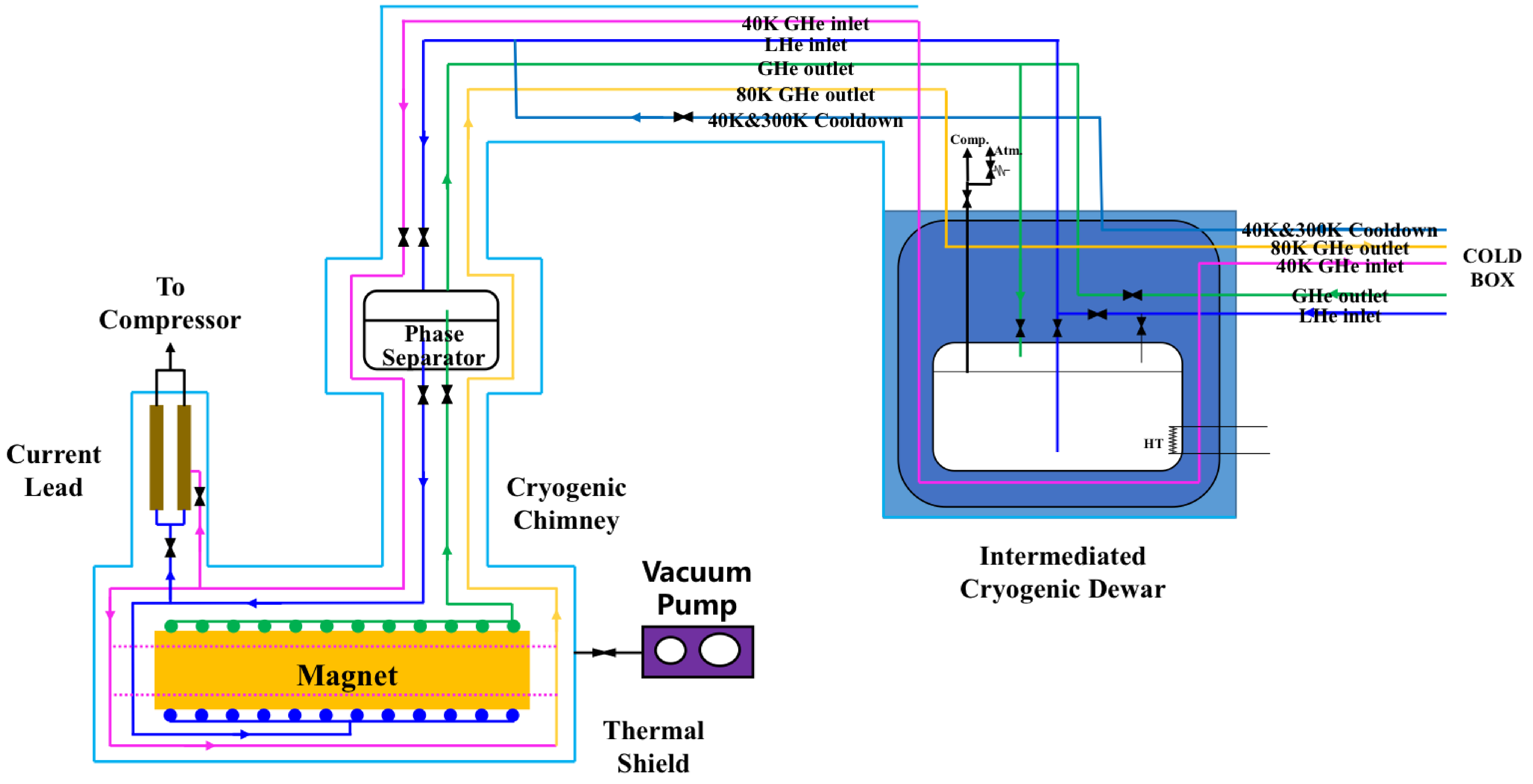


Figure 10.36: Coil cryogenic circuits. The cryogenic system features two independent circuits: a liquid-helium loop that cools the 4 K coil and current leads, and a separate line that maintains the cold shield at 40–80 K.

- The text over the lines is not readable. You can either increase the space between lines to be able to fit the text, or you can create a legend for the different colors. There is enough space to make this plot bigger
- The light blue line end in a random place at the top of the plot. Is this a mistake?
- The caption still does not explain much of the figure. Impossible for a non-expert to understand. I have already mentioned this twice.

Chapter 10

Modified

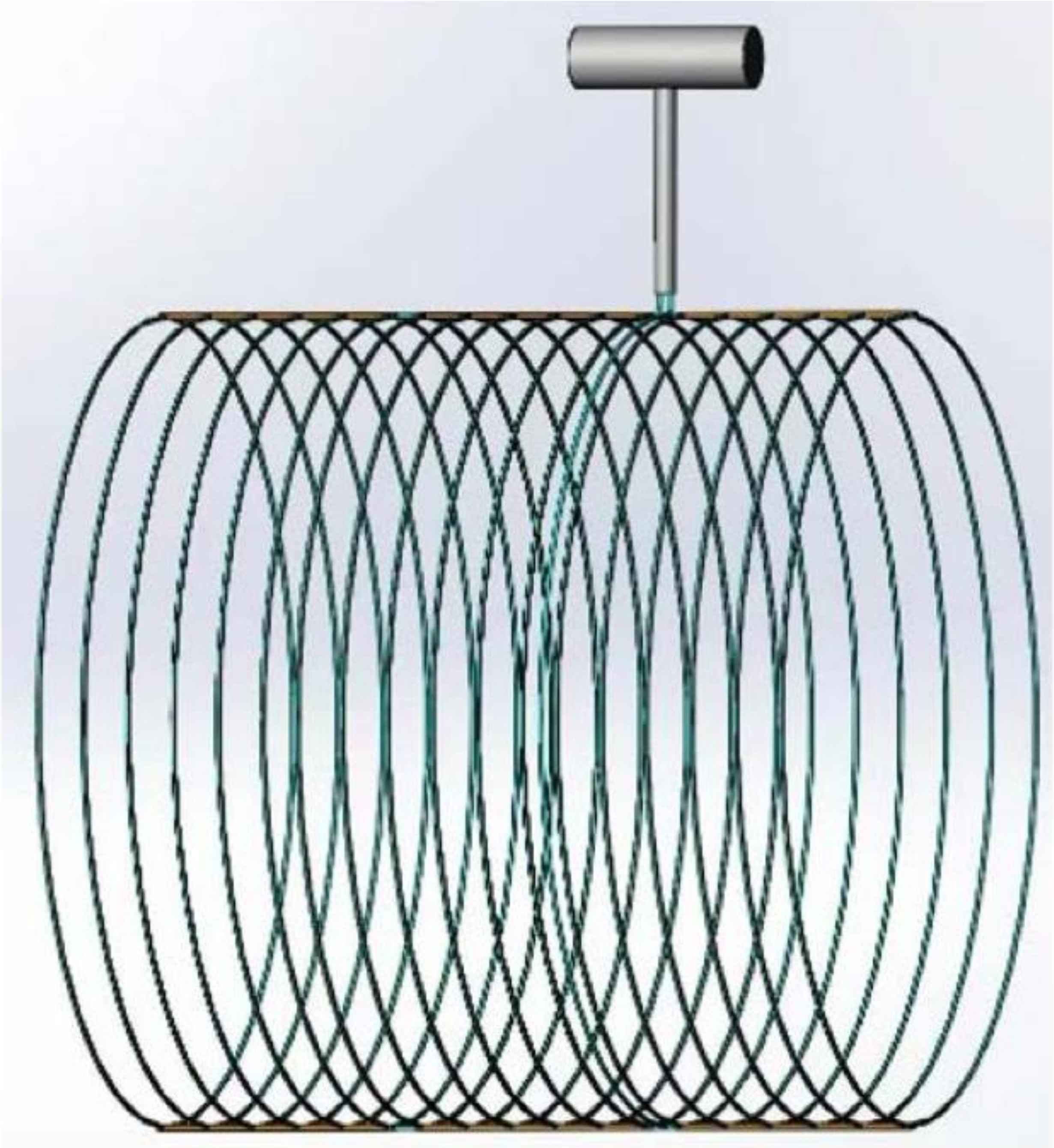


Figure 10.37: Layout of the thermal siphoning cooling channel. It is planned to use 33 parallel semicircular pipes as the main cooling channel, with an inner diameter of 15 mm for each pipe.

- “thermal shiphoning cooling” sounds wrong. In the CDR we called this “Thermosiphon cooling”
- Caption does not describe the chimney and the light blue lines, that remain a mystery to the non-expert
- All pipes are connected at the top and at the bottom? This is not mentioned anywhere.
- 33 semicircular pipes, will result in 16.5 full circles!!…. I see 18 parallel full circles. What am i missing?
- I see no reason for this figure because the coil is again represented in Fig 10.38. What is this figure adding? Specially if the points above are not included?

Chapter 10

Modified

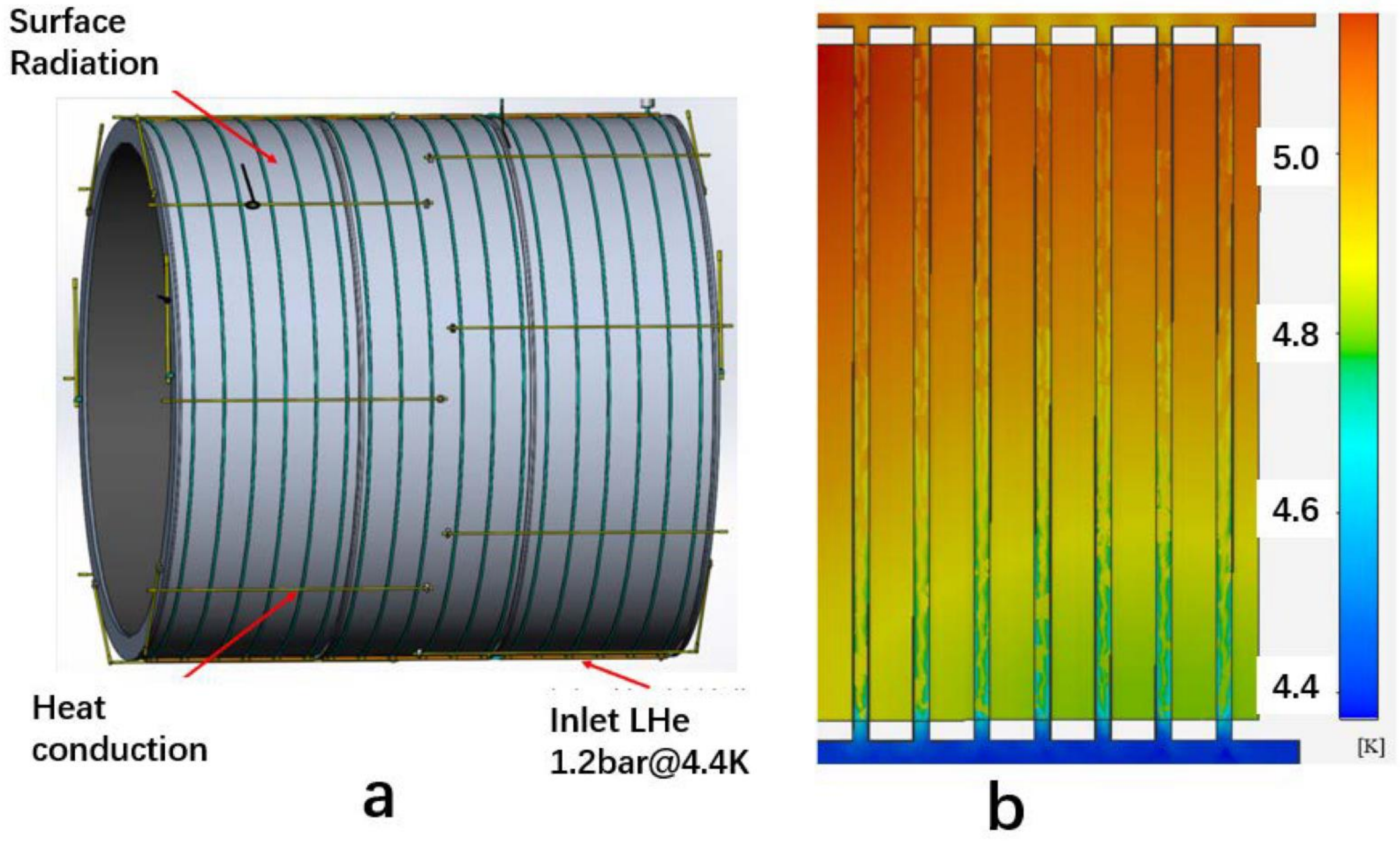


Figure 10.38: Boundary Conditions and Temperature Contour of the coil

- The labeling of figure (a), (b) should be done in Latex, using latex sent by Zhaoru
- The number labels white background is overlapping the picture, which looks sloppy
- 1.2bar should be 1.2 bar, 4.4K should be 4.4 K, etc… (always leave one blank between the number and the units)
- Not clear what surface radiation and heat conduction mean at those points. It is not mention in the caption or text
- Caption: I don't understand what boundary conditions are being mentioned here. It seems irrelevant to the figure

Chapter 10

Modified

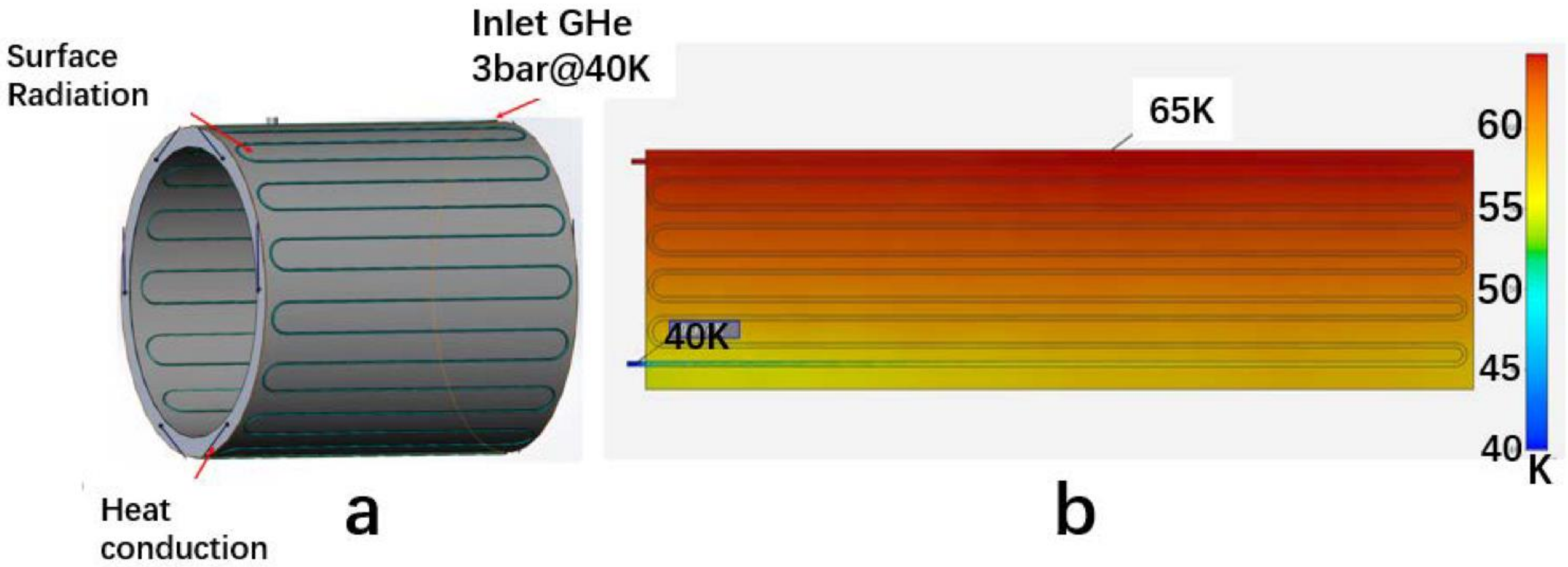


Figure 10.39: Boundary Conditions and Temperature Contour of the thermal shield.

- The labeling of figure (a), (b) should be done in Latex, using latex sent by Zhaoru
- The 40K label is overlapping the drawing… It should be somewhere else, e.g. below
- 3bar should be 3 bar, 40K should be 40 K, etc… (always leave one blank between the number and the units)
- Not clear what surface radiation and heat conduction mean at those points. It is not mention in the caption or text
- **Caption**: I don't understand what boundary conditions are being mentioned here. It seems irrelevant to the figure
- This plots 10.39b does not show the average temperature, as it is mentioned in the text

Chapter 10

Modified

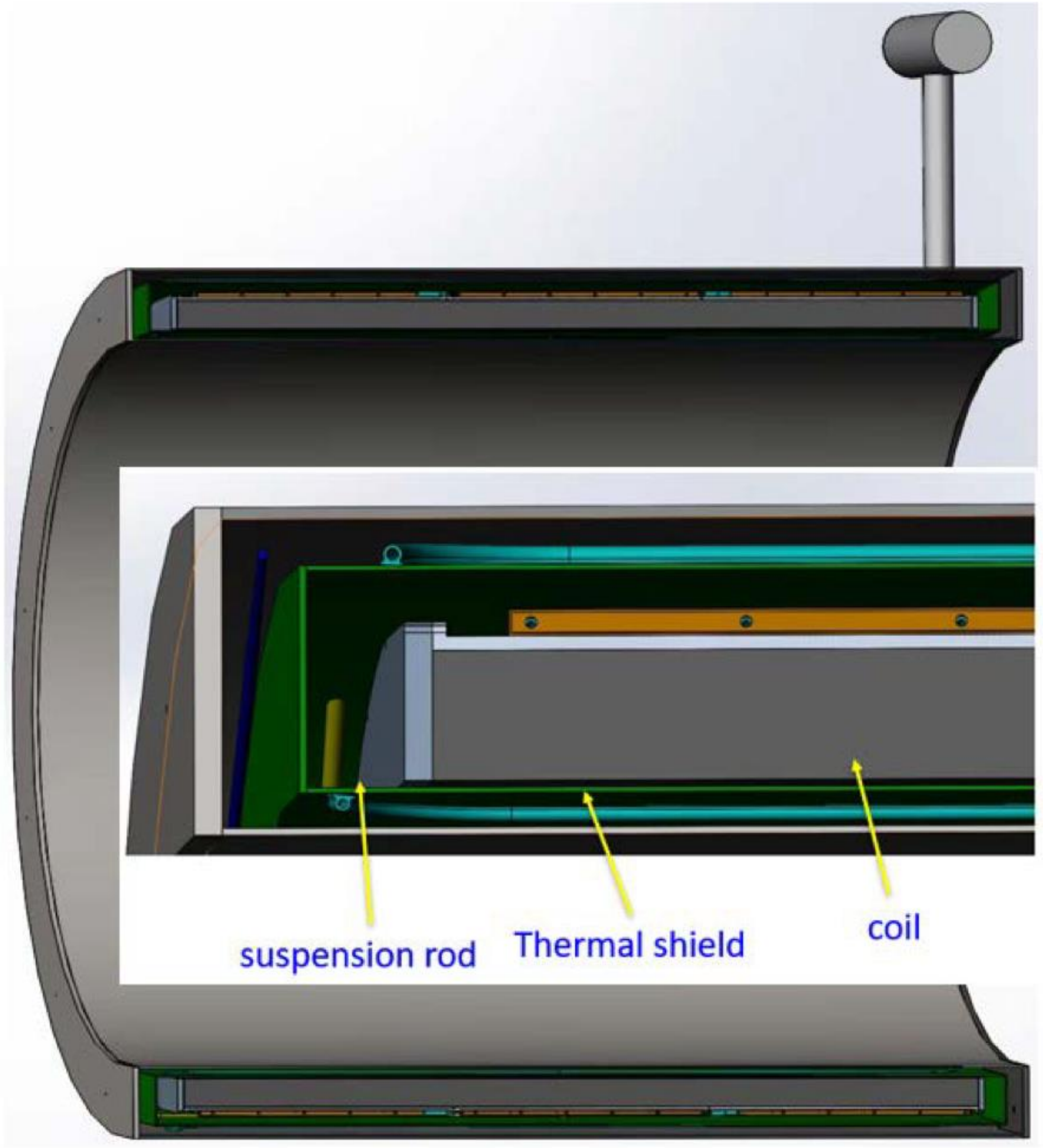


Figure 10.40: Structure of the detector magnet.

- This goes with Figure 10.6, i guess
- We should not overlap the two plots. They could be displayed side by side, with emphasis to the cut-out, which is the one with the most information. There is enough space for a side by side display, with (a), (b) labels in Latex.
- **Caption**: needs to be expanded to explain what we are seeing

Chapter 10

Modified

Figure 10.41: Structure of the thermal shield. The cooling is achieved by forced flow method using 40 K cold helium gas.

- Delete
- This figure of the thermal shield is already in figure 10.39a. No need to repeat here. Just reference that figure.

Chapter 10

Modified

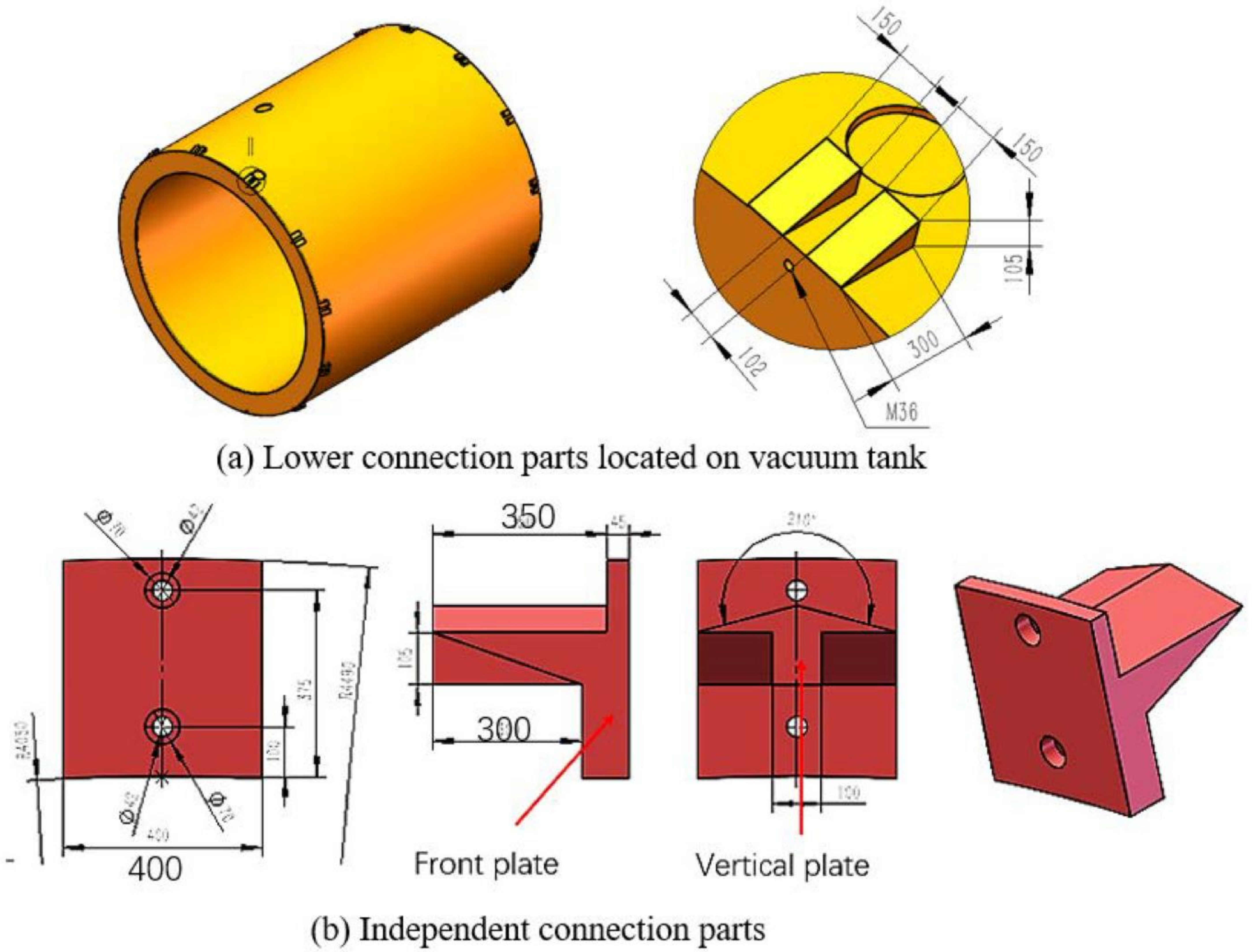


Figure 10.42: Magnet support system structure.

- Overall quality of the figure is poor. JPEG?
- Quality of some of the numbers is too low to be seen, font is too light and too small
- Do not right numbers on the top of numbers
- There are no units in this plot
- What is the cylinder? the magnet? Not clear without dimensions or clear caption
- Is this is a repeat of chapter 14? If so, we should delete one of them. I had understood that these mechanical aspects would be in chapter 14. If adding more detail, chapter 14 should be referenced

Chapter 10

Modified

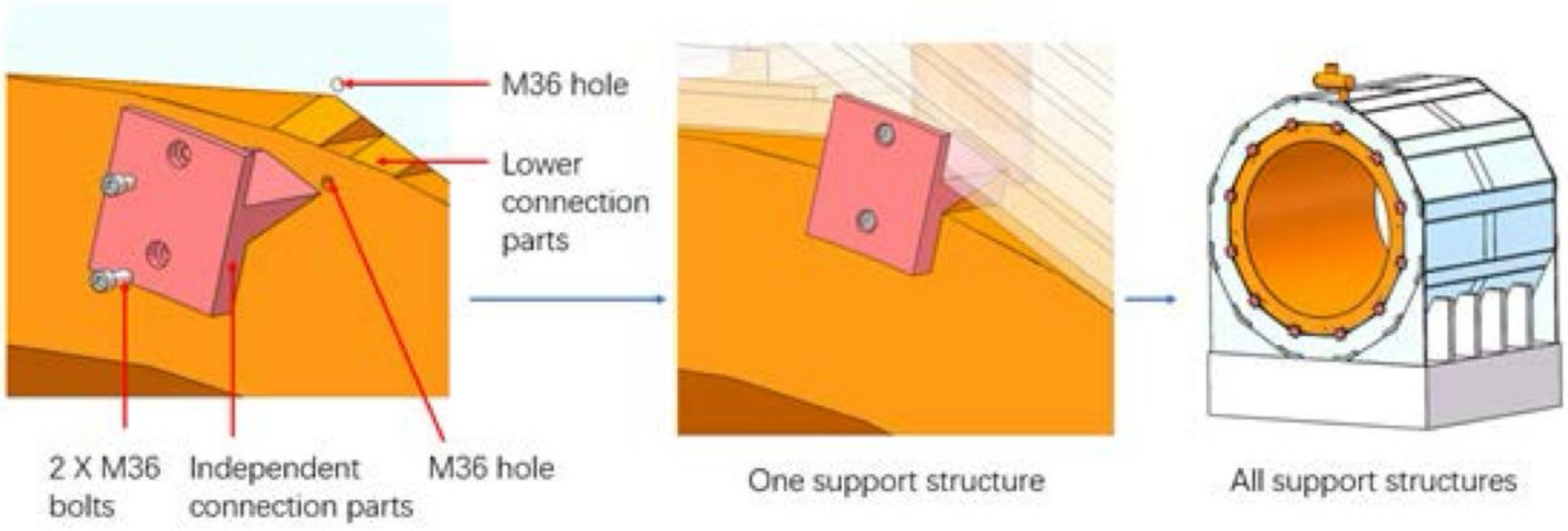


Figure 10.43: Final connection structure.

- Overall quality of the figure is poor. JPEG?
- Figures should be labeled a, b, c in latex
- Is this is a repeat of chapter 14? If so, we should delete one of them. I had understood that these mechanical aspects would be in chapter 14. Do not right numbers on the top of numbers

Chapter 10

Modified

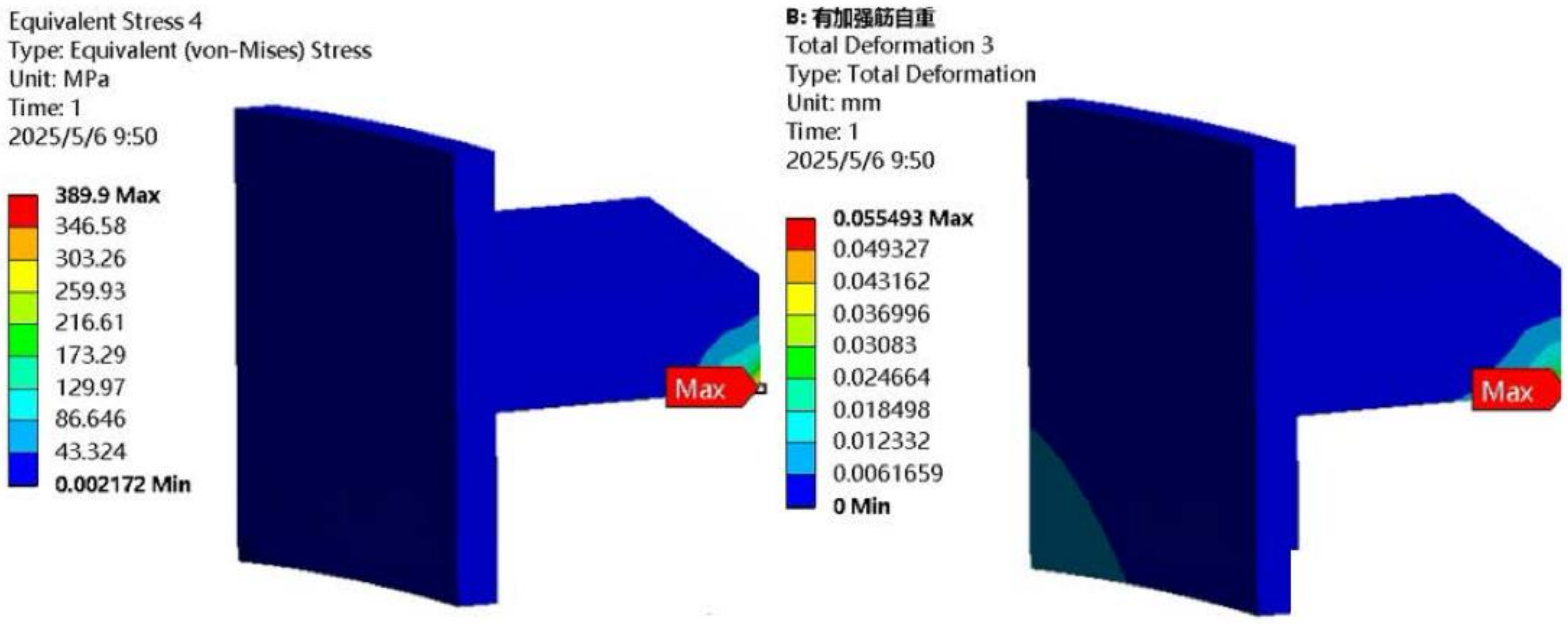


Figure 10.44: The deformation and stress of support system under gravity condition.

- Overall quality of the figure is poor. JPEG?
- No chinese characters in the TDR
- Too many significant figures in the legend
- Caption does not explain what we are seeing. What is the object?
- Figures should be labeled (a) and (b) and the caption should have the same order

Chapter 10

Modified

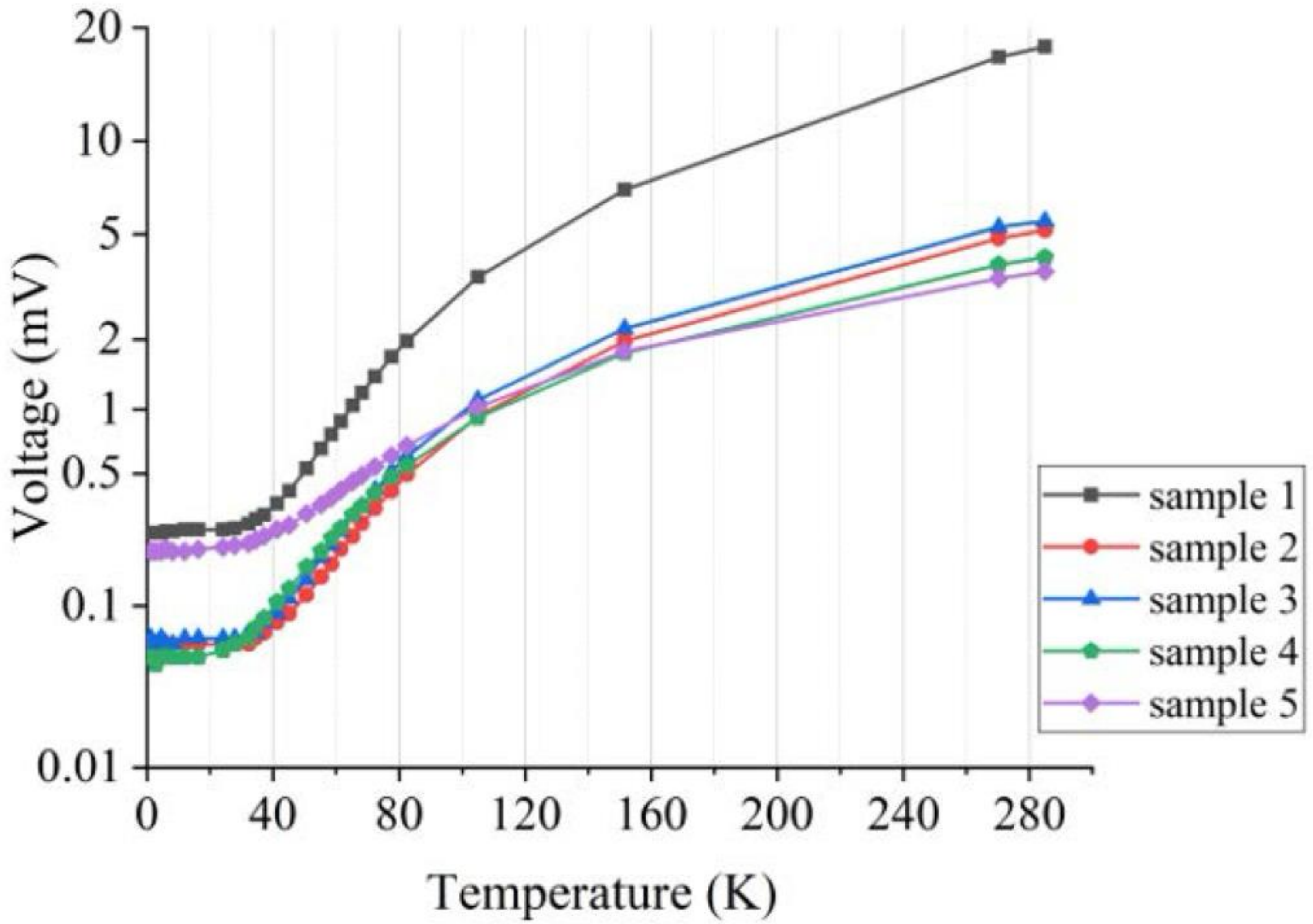


Figure 10.46: The voltage of the sample during the cooling process.

- Overall quality of the figure is poor. JPEG?
- What are these 5 samples. Not mentioned in the caption or text. It needs to be mentioned. Just “sample 1, 2, …” is not OK. Some explanation should be at least added to the caption

Chapter 10

Modified

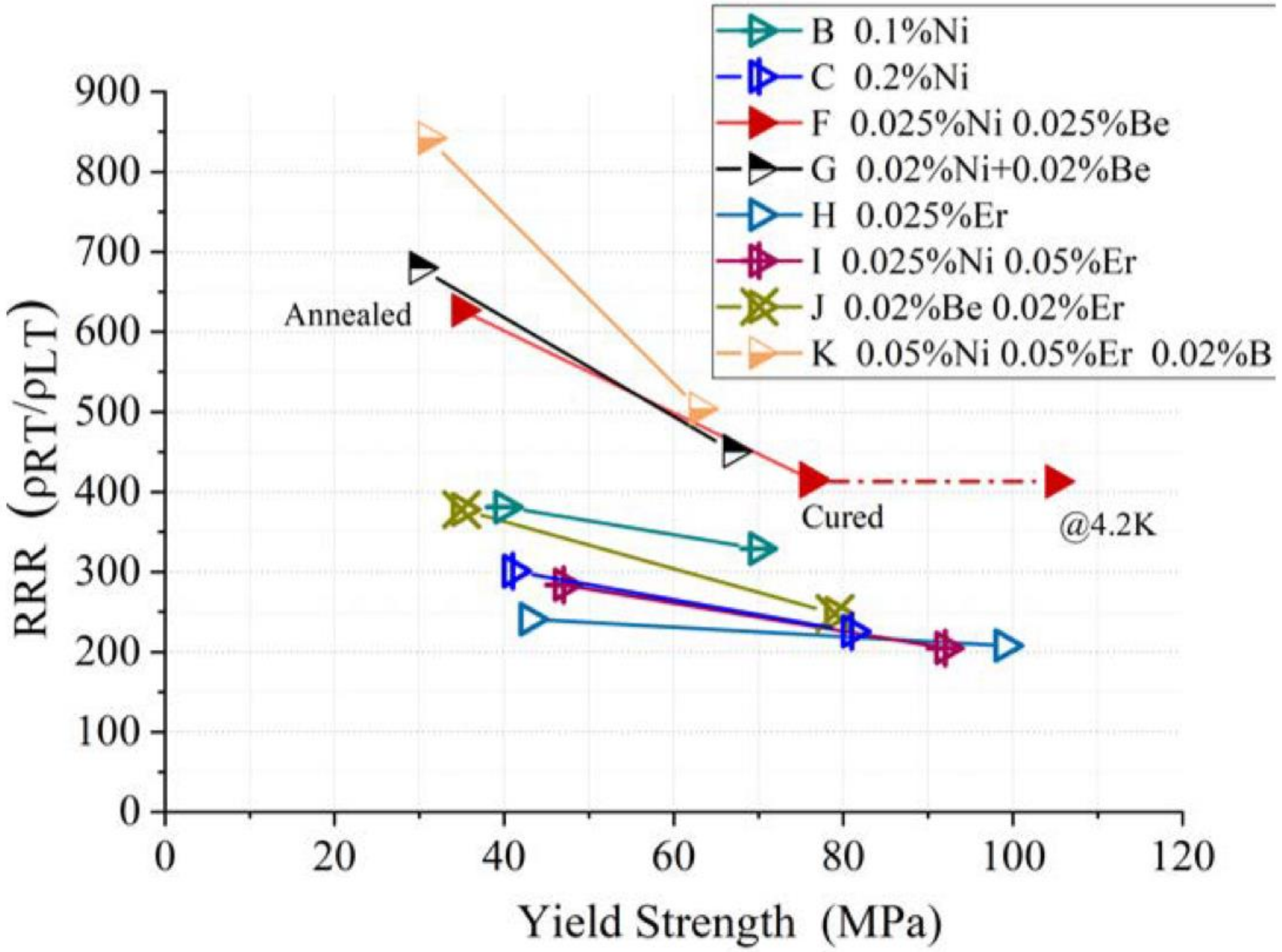


Figure 10.47: The RRR values and yield strengths of eight different types of doped aluminum samples

- Overall quality of the figure is poor. JPEG?
- Caption suggestion: "…. of eight different aluminum samples doped with Ni, B, Be, and Er (what is Er??)

Chapter 11 - Electronics

Comments based on version from 2025-07-25 at 11:27 am

- Figures look generally very good

Modified

Chapter 11

Modified

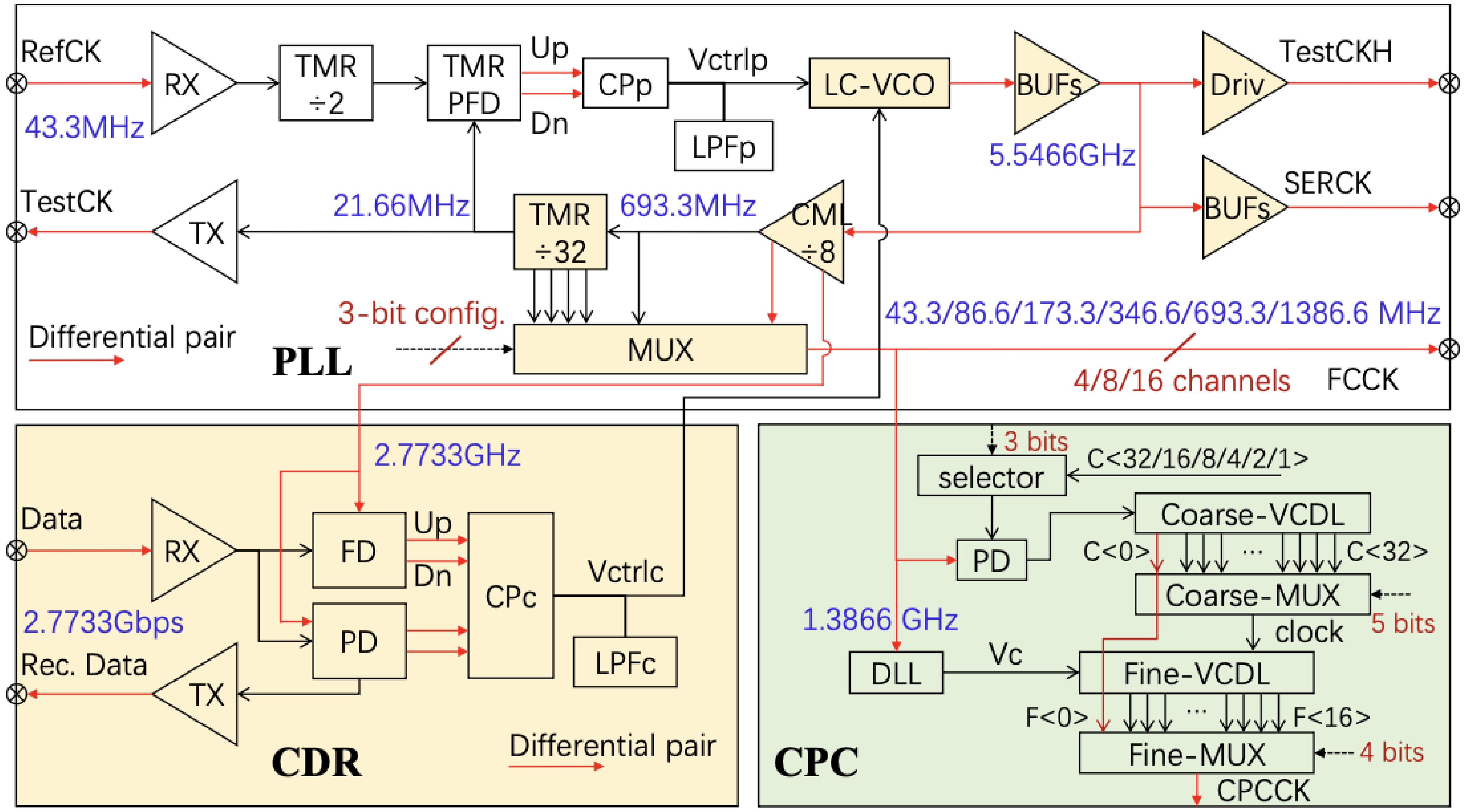


Figure 11.6: The on-chip clock system mainly comprises PLL, Conceptual Design Report (CDR) and CPC.

- You have an electronics block called "Conceptual Design Report"…
- Usually, it is better to redefine the acronyms in the caption, otherwise you need to explain their functionality. This might still be needed if it is not clear from the name.
- --CDR was due to the wrong linked glossary

Chapter 11

Modified

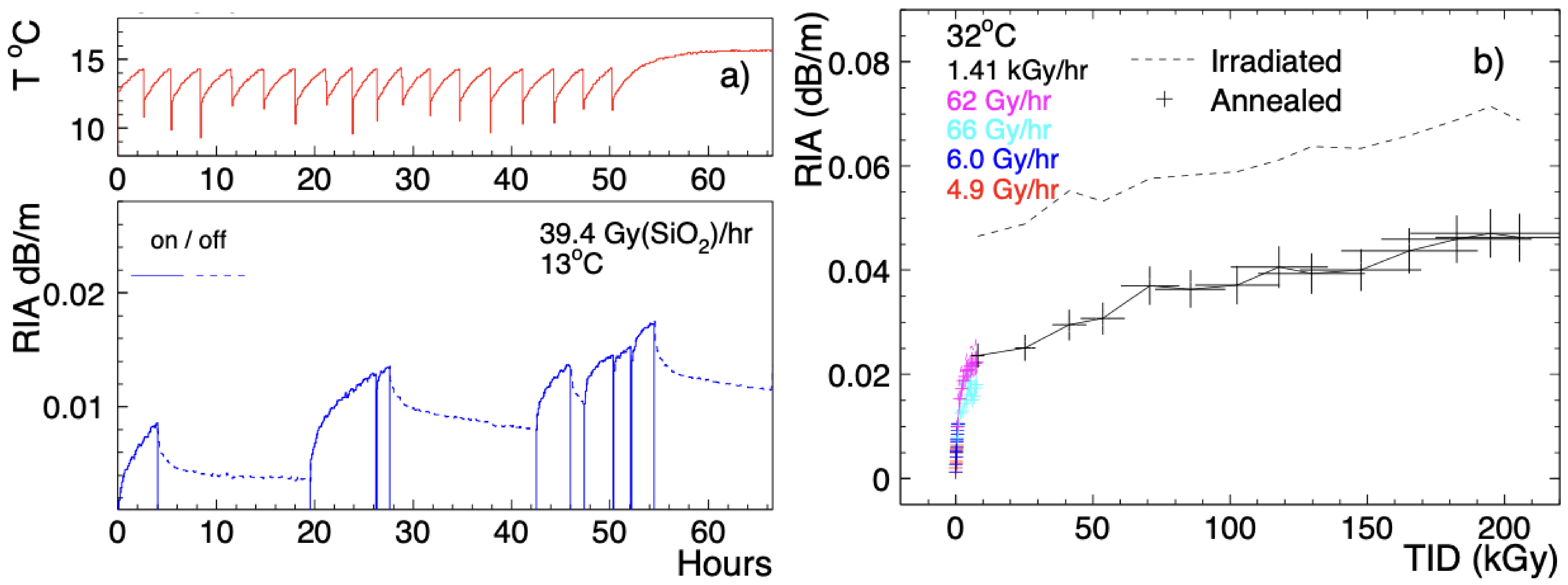


Figure 11.12: (a) The RIA of a rad-hard Ge-dope fiber sample is plotted in irradiation test at dose rate of 39.4 Gy/hr at 13 °C, in irradiation (solid line) and in annealing (dashed line). (b) The daily RIAs of five fiber samples tested at 32 °C at various dose rates are plotted in irradiation (dashed line) and after 10 hours annealing (points).

- Define what is an RIA in the caption
- Mark (a) and (b) in latex, using format Zhaoru indicated
- Plot (a) is of temperature, but caption says it is RIA. What is the goal of this temperature plot? The caption says the measurement was done at 13C, is that an average temperature and this is the actual fluctuating temperature, or 13C is an actual fixed temperature (then the plot would be meaningless)?
- Usually, it is better to redefine the acronyms in the caption, otherwise you need to explain their functionality. This might still be needed if it is not clear from the name.

Chapter 11

Modified

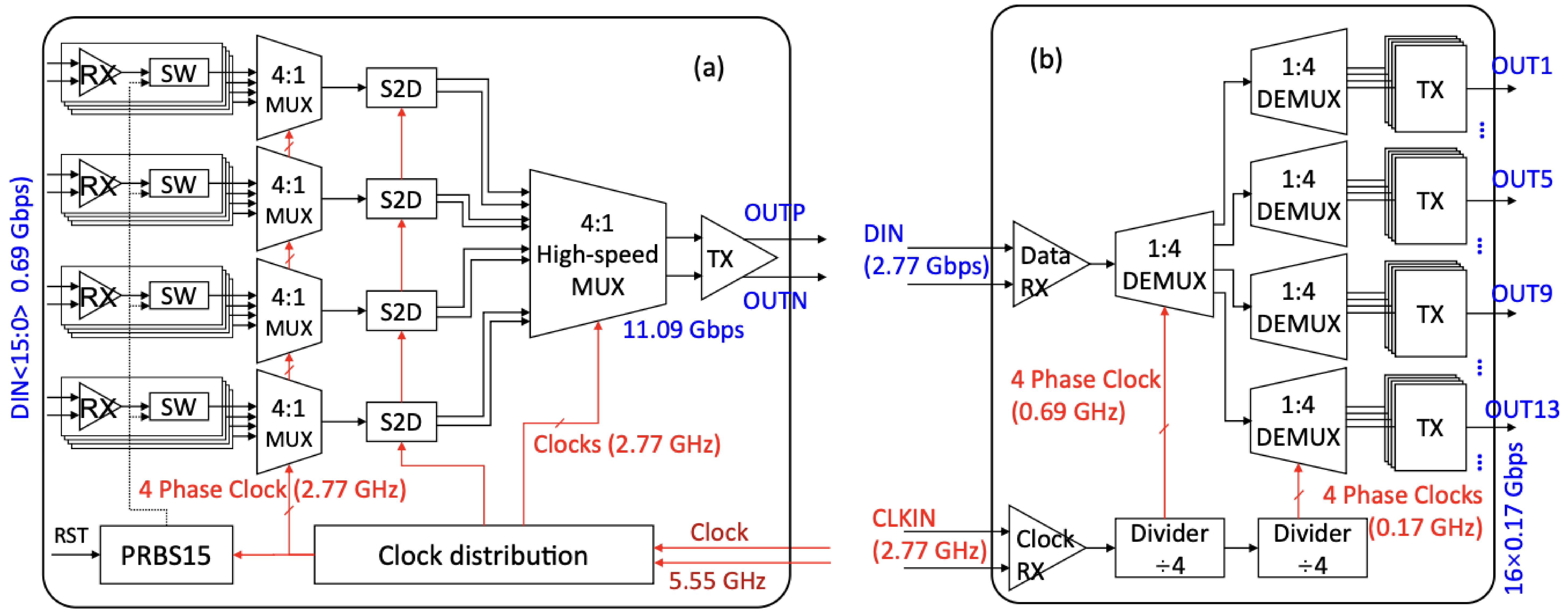


Figure 11.7: (a) The serializer employs a two-stage 4:1 MUX circuit in a cascaded configuration to serialize 16 channels of 693.33 Mbps parallel input data into a serial 11.09 Gbps output. (b) The deserializer consists of a Data Receiver Circuit (DRX), a 1:4 Demultiplexer (DEMUX), a Single-Ended-To-Differential (S2D) circuit, an Low-Voltage Differential Signaling (LVDS) output circuit, a Clock Receiver Circuit (CRX), and a divide-by-4 circuit (Divider/4).

- Mark (a) and (b) in latex, using format Zhaoru indicated

Chapter 11

Modified

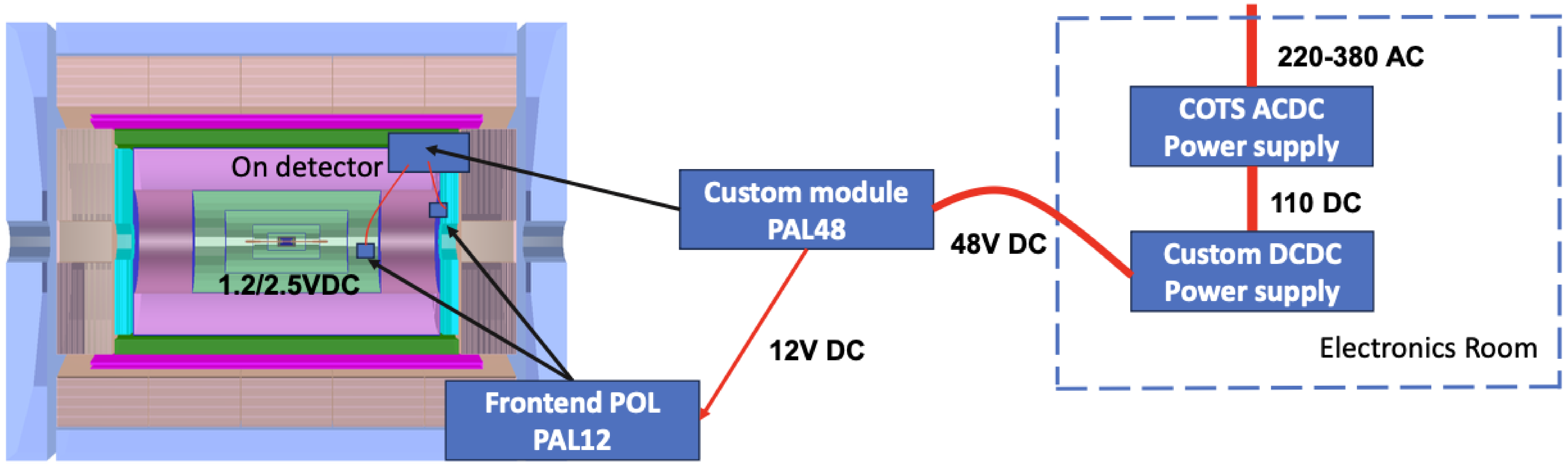


Figure 11.19: Low-voltage power distribution. The system utilizes a two-stage DC-DC conversion architecture: the PAL48 module reduces 48 V input to 12 V near the end-cap to minimize high-voltage transmission losses, while the PAL12 module on the front-end board further converts 12 V to the required 1.2 V, 2.5 V or 3.3 V.

- The image of the detector seems to be an old one. The other pictures of the detector have the solenoid reaching the full width of the endcap HCAL and the vertex detector seems larger than the latest design

- ---replaced with the new detector image.

Chapter 11

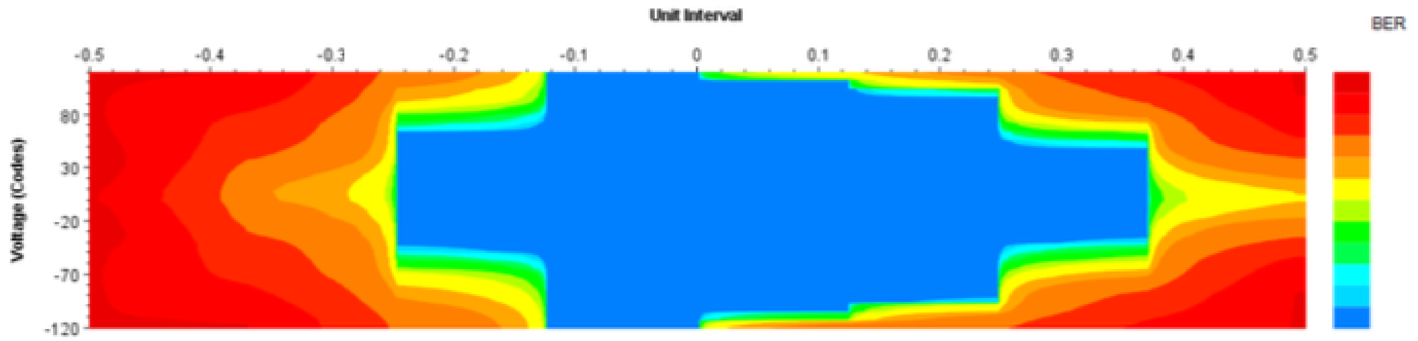


Figure 11.25: GTH eye diagram. The loopback tests used a PRBS at conditions of 120 Gbps (single channel at 10 Gbps, PRBS $2^{31} - 1$). The tests were carried out until the error rate reached a Bit Error Rate (BER) of 10^{-15} (the Ethernet transmission standard for 10 Gbps requires an error rate of below BER 10^{-12}).

Modified

- Font in the figure is too small to be readable
- --original plot is hard to modify. We removed it and put the main results in the context.

Chapter 12 - TDAQ

Comments based on version from 2025-07-26 at 12:41 pm

- Figures look generally very good
- Fixed caption typos on 12.3, 12.4
- Don’t put \label (e.g. \label{fige:triggerelectronicsplugin}) inside the caption. This should go inside the figure environment.

Modified

Chapter 12

Modified

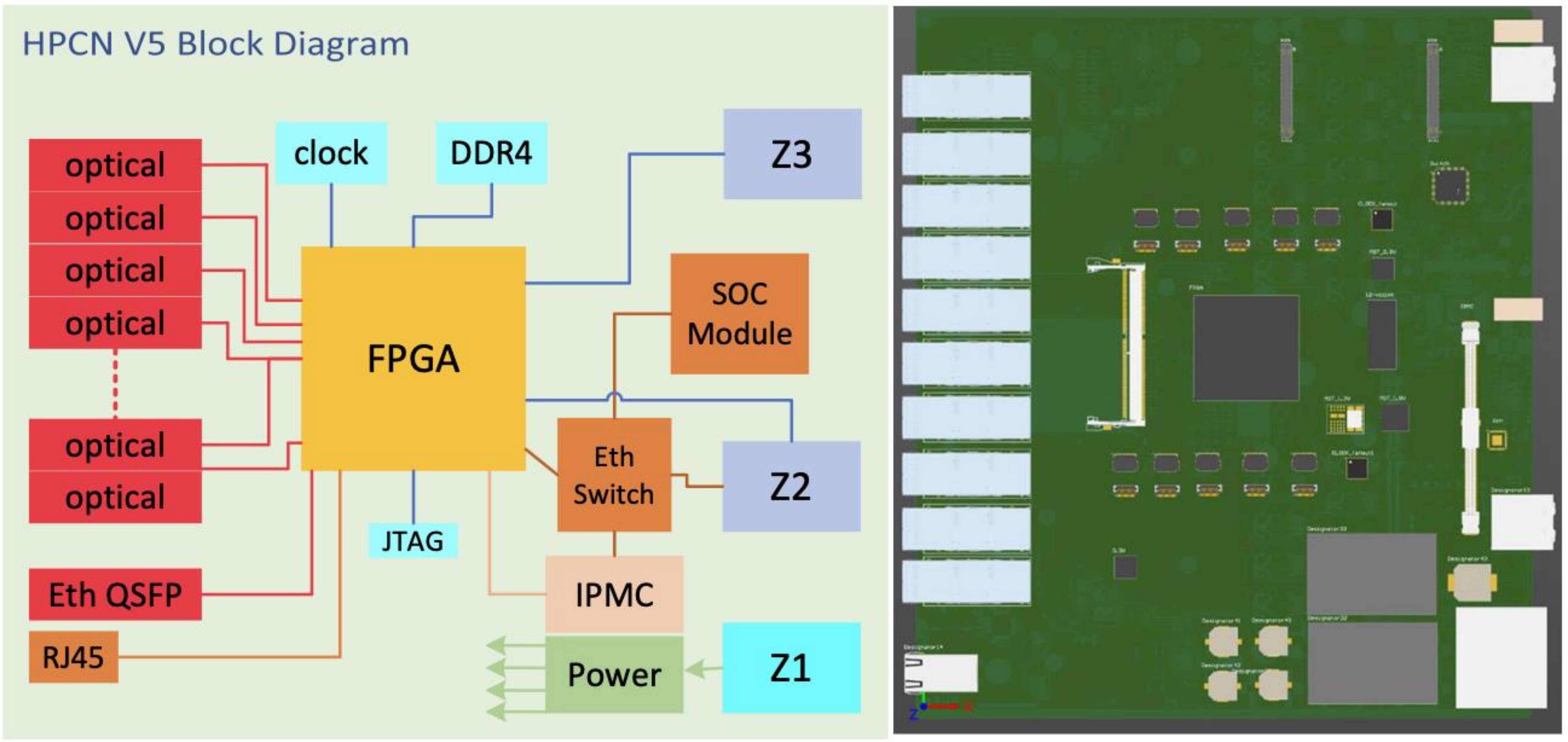


Figure 12.3: Diagram of the proposed structure of the trigger electronics plug-in principle prototype.Left part is the connection structure. Right part is the 3D view of the layout..

- Use (a) and (b) to reference figure, not left and right.
- However, it is not clear that the 3D view of the layout is needed. What is the goal to show this? Is there any extra information that provides? The text does not reference to it, so it should be removed. We should only have figures that we reference in the text.
- Removed extra "." at end of caption

Chapter 12

Modified

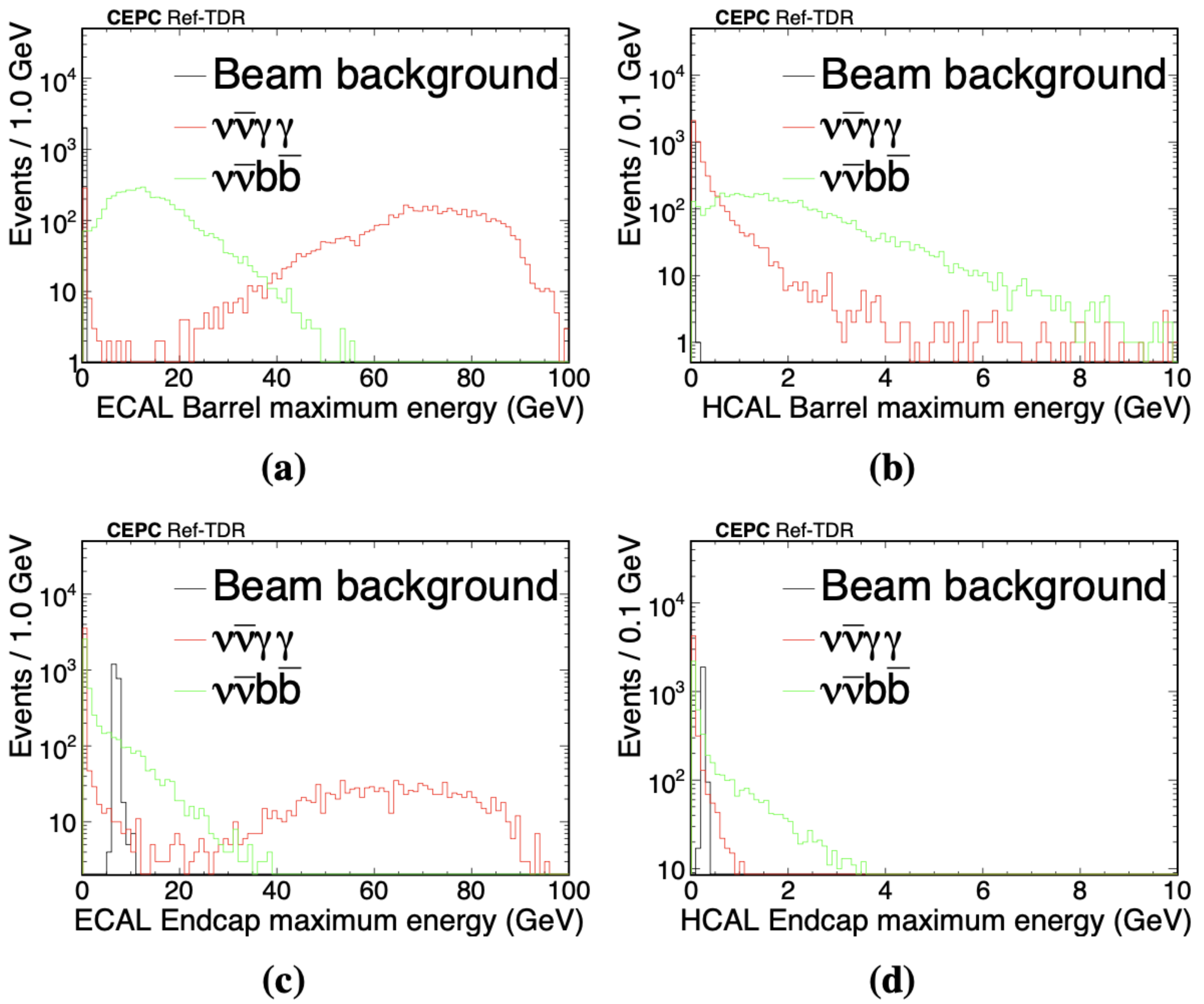


Figure 12.6: Maximum energy distribution of the supercell of beam background, $e^+e^- \to Z(\nu\bar{\nu})H(\gamma\gamma)$ and $e^+e^- \to Z(\nu\bar{\nu})H(b\bar{b})$. (a): ECAL Barrel; (b): HCAL Barrel; (c): ECAL Endcap; (d): HCAL Endcap.

- Ok figure but the green light color will not be visible in presentations, if we want to show this plot later
- CEPC label is very small compared to the other text. Not critical issue, but if remake the plot, it could be improved

Chapter 13 - Software

Comments based on version from 2025-07-25 at 14:00 am

- Figures look generally very good
- Fixed caption 13.6, 13.7, 13.10, 13.11

Modified

Chapter 13

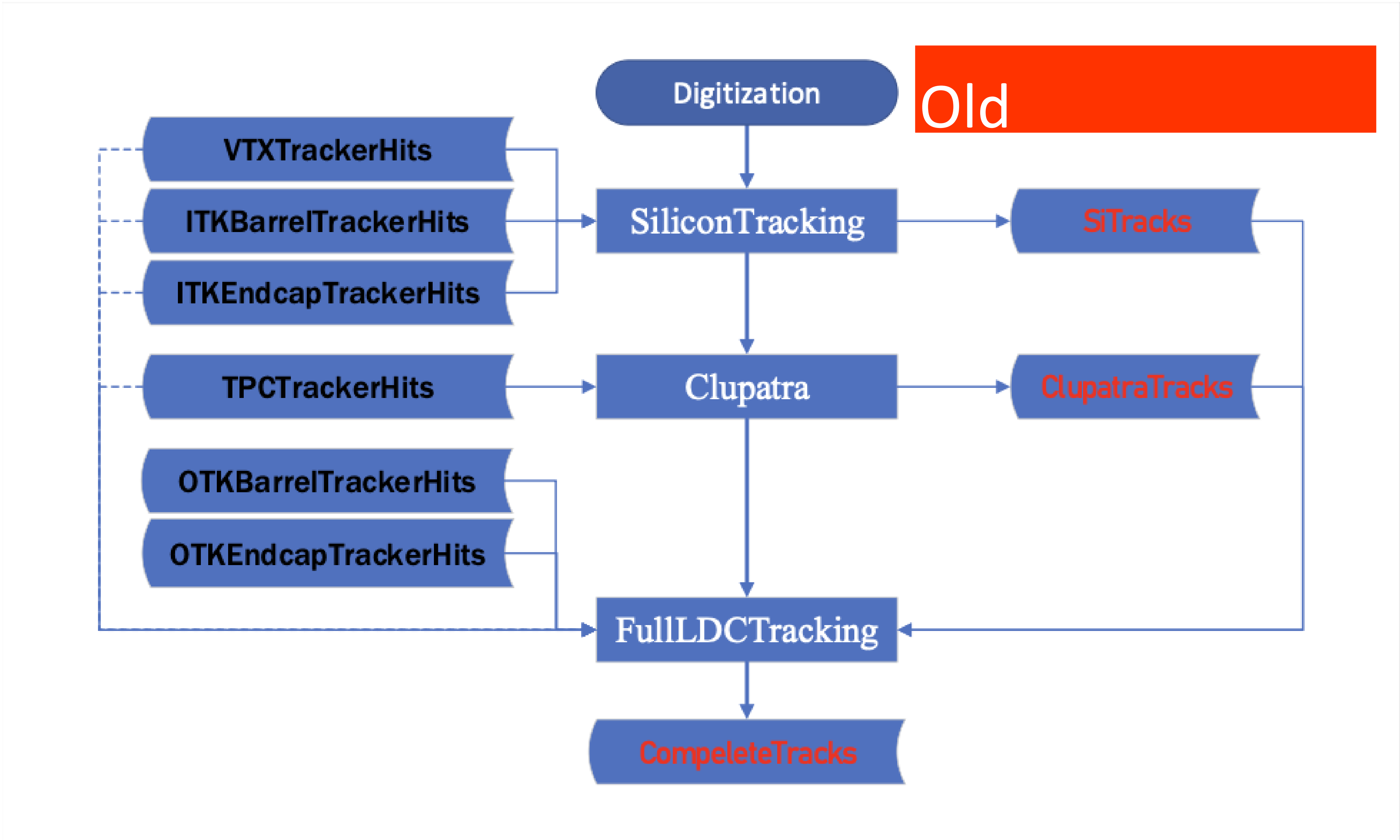
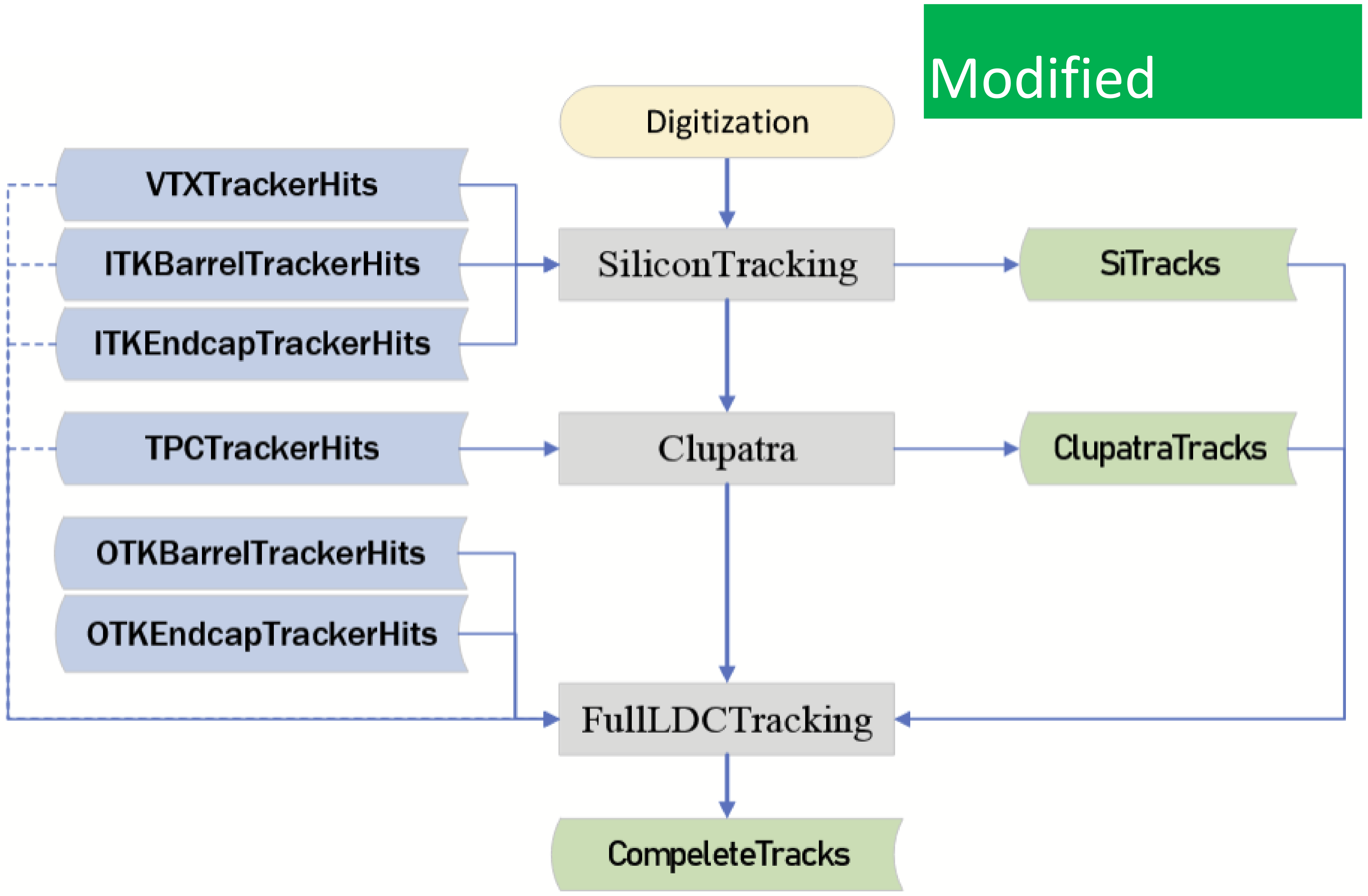


Figure 13.5: Flow of tracking reconstruction from digitized `TrackerHit` objects: the input hits are processed through track finding to create track candidates and fit track objects and the non-assigned hits undergo a secondary tracking test during the track combining phase to ascertain their potential association with specific tracks.



- Color scheme is problematic. It is difficult to read both the black and the red on this dark blue. Use a lighter color, like light blue.

Chapter 14 - Mechanics

Comments based on version from 2025-07-26 at 10:32 am

- Most of my comments are a repeat from previous comments because they were not taken into consideration
- There are many drawings that are small additions to prior ones. All information could be much more compact
  - People have little patience to read long documents, so sometimes more is less.
- Dimensions should not be mentioned as “boundary dimensions”
- Detectors are usually described inside out, not outside in. This is rather confusing.
- Terms like “are adopted”

Modified

Not modified

Chapter 14

Modified

Not modified

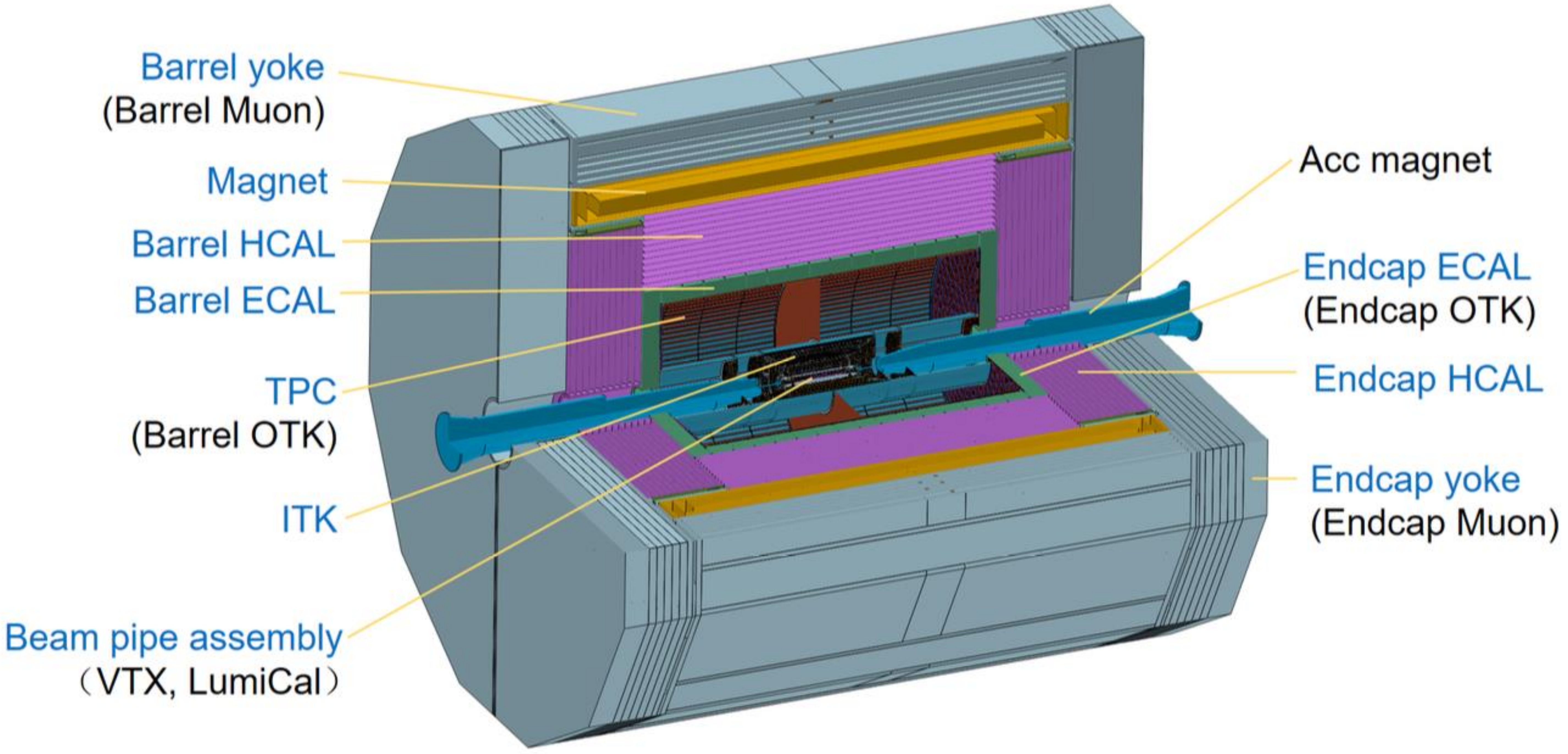


Figure 14.1: The overall installation components of the CEPC reference detector. The barrel yoke with the barrel Muon detector, the TPC with the barrel OTK, the beam pipe with the VTX and LumiCal, the endcap ECAL with the endcap OTK, the endcap yoke with the endcap Muon detector, will be assembled as one component before proceeding to the final installation.

- Still have trouble to understand how to make the best use of this figure, when we have many other figures in this section with the same information
  - Will either still improve english of the caption or remove

Chapter 14

Modified

Not modified

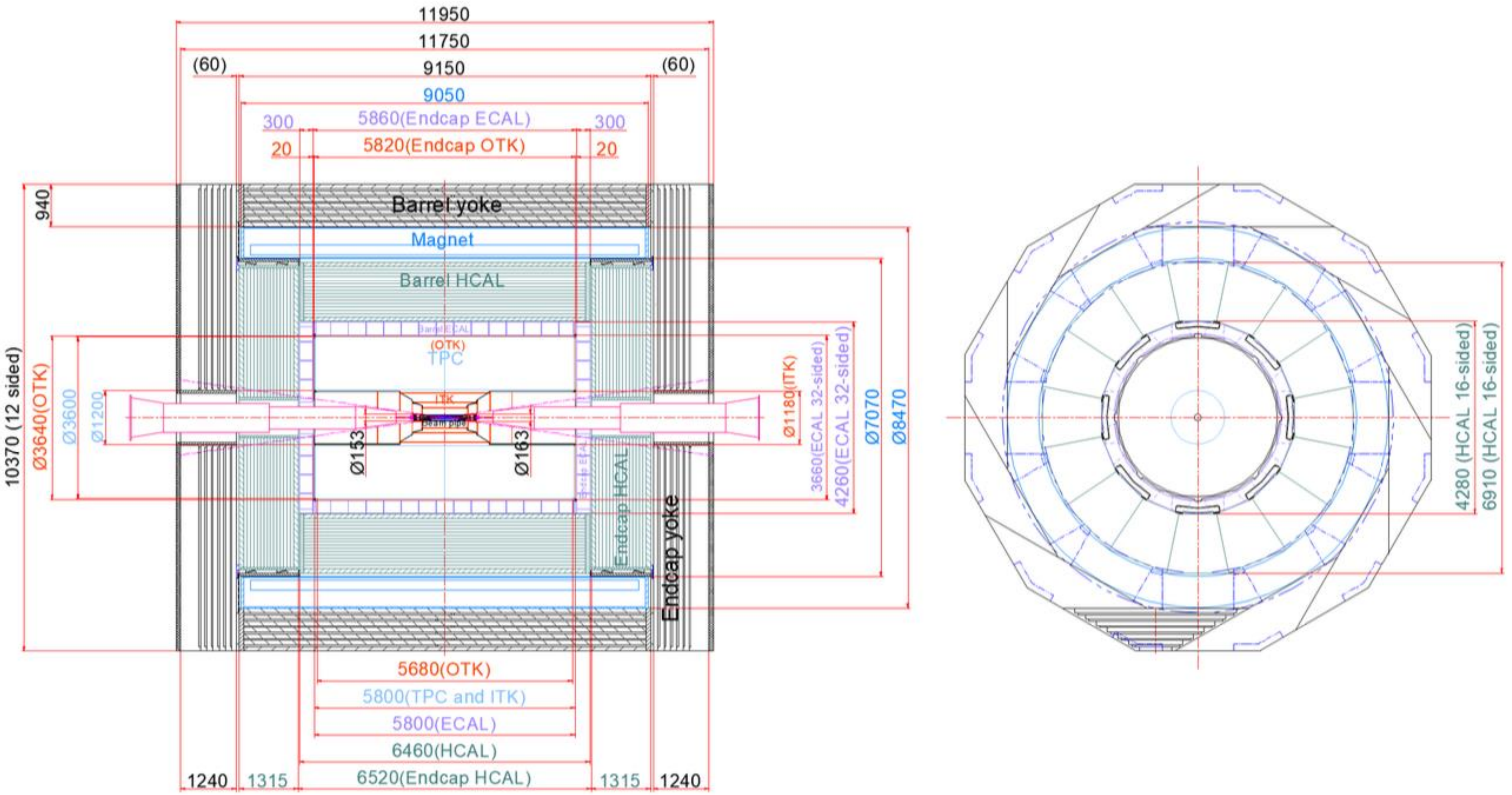


Figure 14.2: The overall layout of the CEPC reference detector and the dimensions of each sub-detectors. (unit:mm)

- As asked before, this figure should be larger so that the details can be seen. Just complex figure needs a full page
- Use (a) and (b) to describe picture
- The layer of paraffin here seems to still be outside of the yoke. I had understood that we agreed it needs to be included inside, like the muon chambers.

Chapter 14

Modified

Not modified

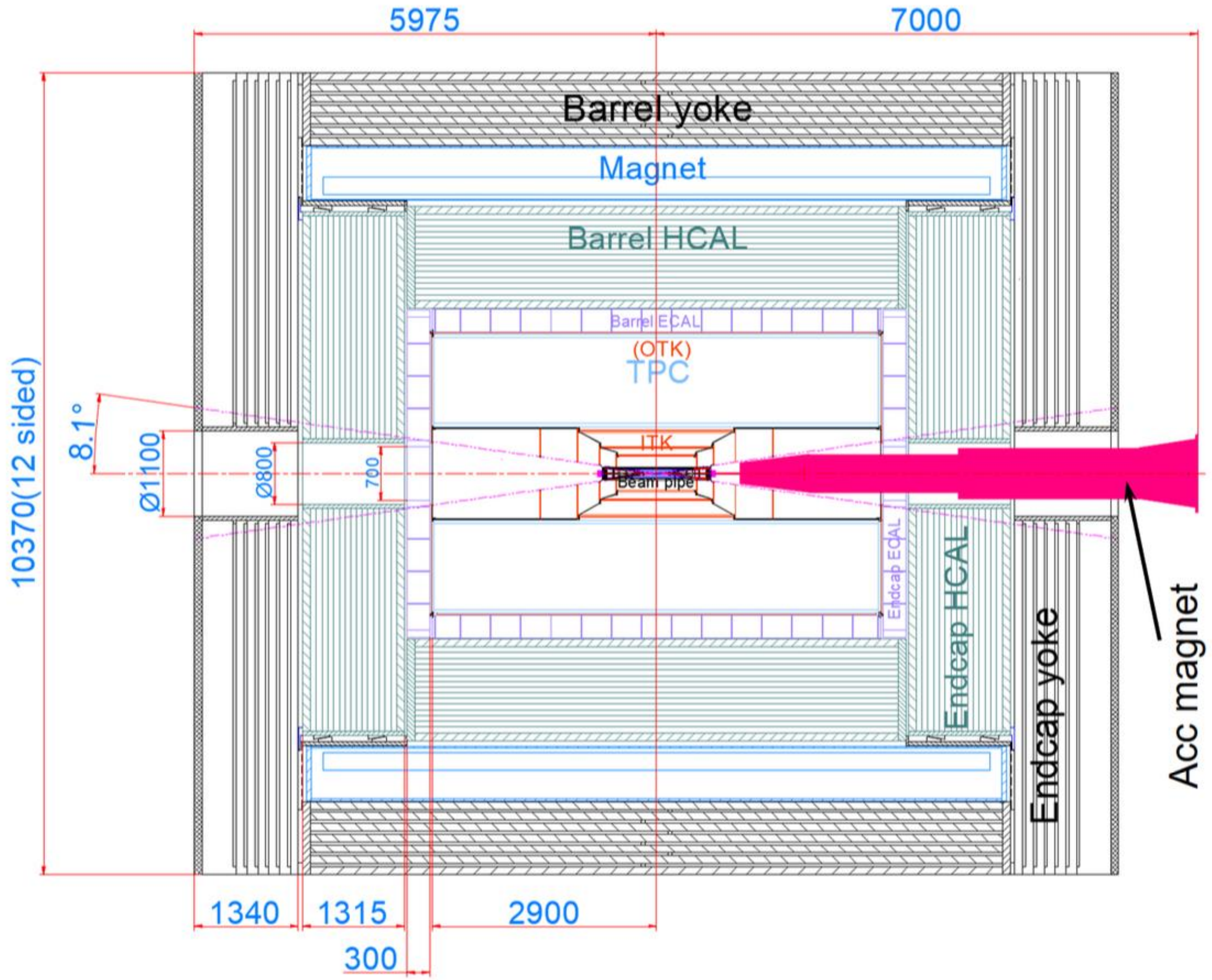


Figure 14.3: Interface between detector and accelerator. The detector and accelerator design boundary includes one tapered hole and three step holes. (unit:mm)

- Not clear what new information this figure brings, when compared to the almost identical figure in 14.2.
- Should select one figure and provide all information

Chapter 14

Modified

Not modified

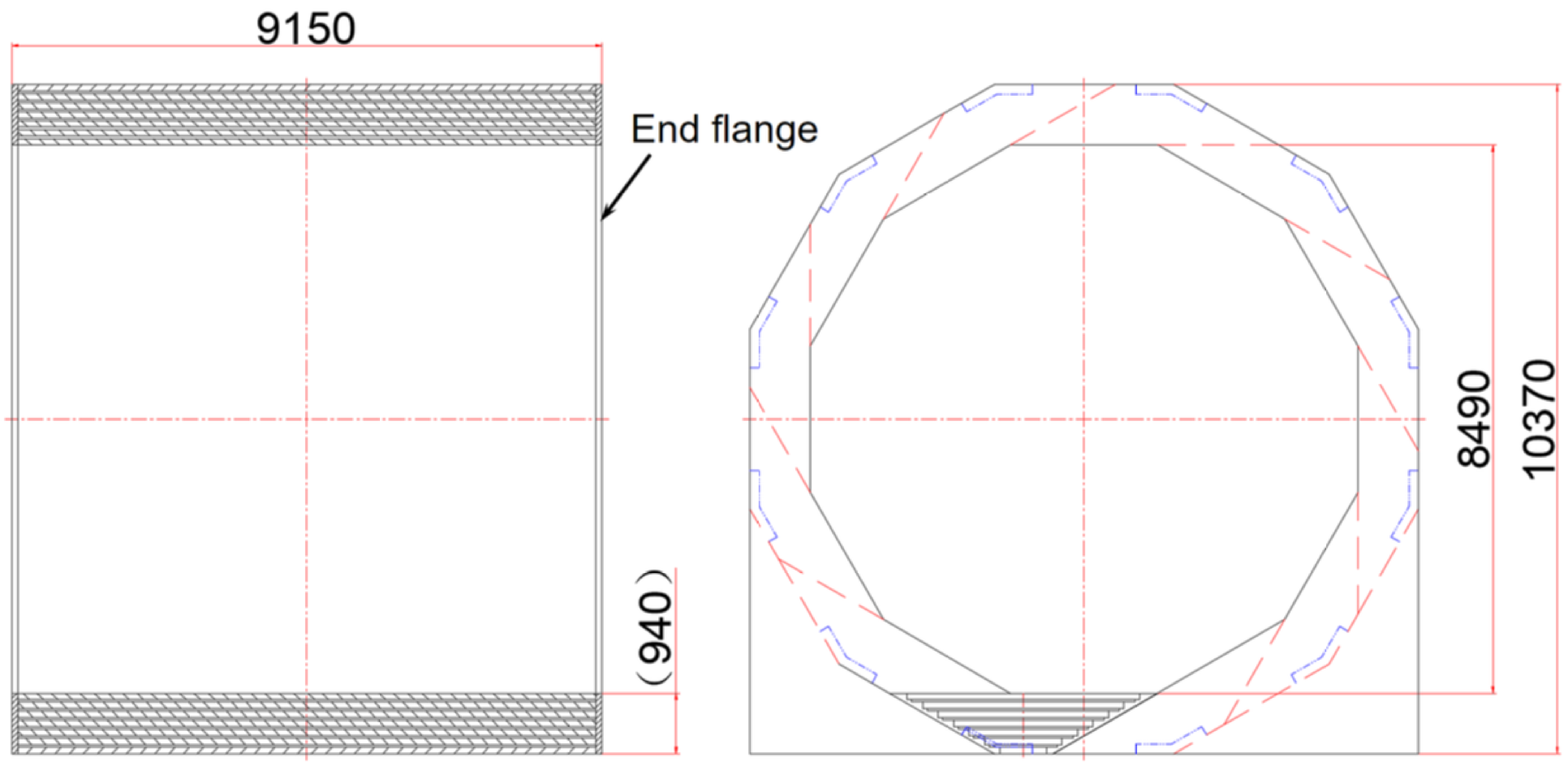


Figure 14.4: Boundary dimensions of the barrel yoke, as a 12-sided spiral assembled structure. Two additional end flanges serve as the support for the barrel yoke modules. (unit:mm)

- Caption text different from the magnet. This shape is not a **spiral.** The magnetic calls it a dodecagon, which is much better. This is a “regular dodecagon”.
  - The end flanges has a cut-out in the right drawing, so that should be mention it in the caption.
  - Talking about “boundary dimensions” is bizarre in a physics document. Caption should focus on the object, not the dimensions which are clearly there on the drawing
- **Caption suggestion:** Axial and transversal view of the barrel yoke structure. In the transverse plane, the yoke has a regular dodecagon shape. Two additional end flanges serve as the support to the barrel yoke modules. Six layers of muon chambers are embedded in the yoke, and are seen through a cut-out on the end flange at the bottom.

Chapter 14

Modified

Not modified

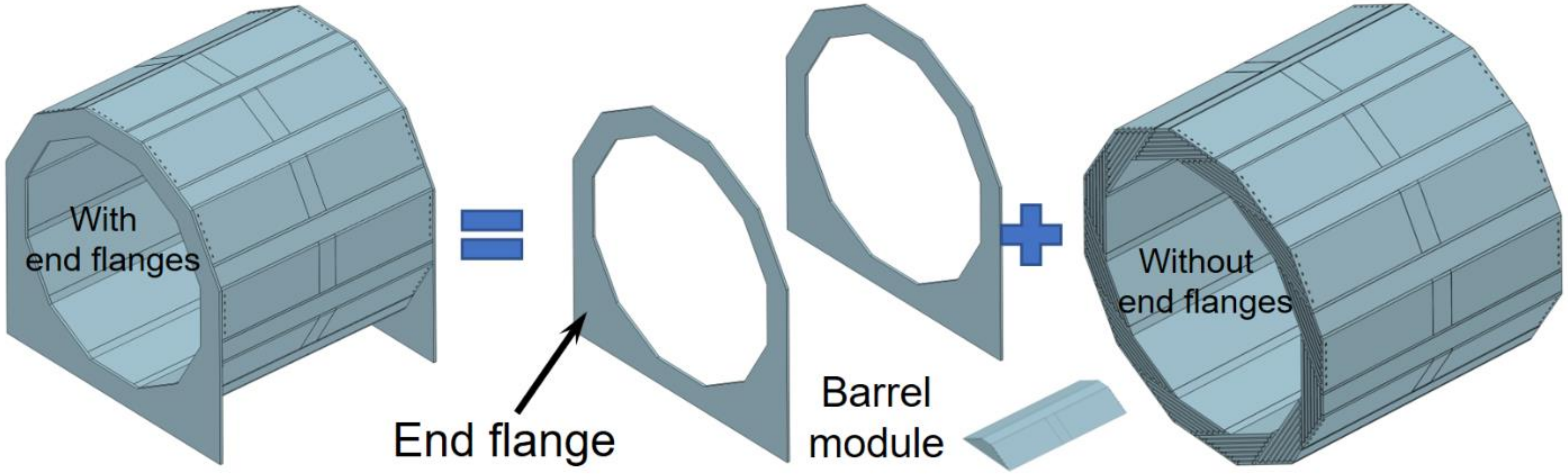


Figure 14.5: The idea of the inter-supporting connection structure, the two end flanges facilitate the yoke installation.

- This figure does not seem necessary since the same information is in figure 14.6. We should just keep one of these.
- The flanges in this figure are different from the ones in the drawing in 14.6

Chapter 14

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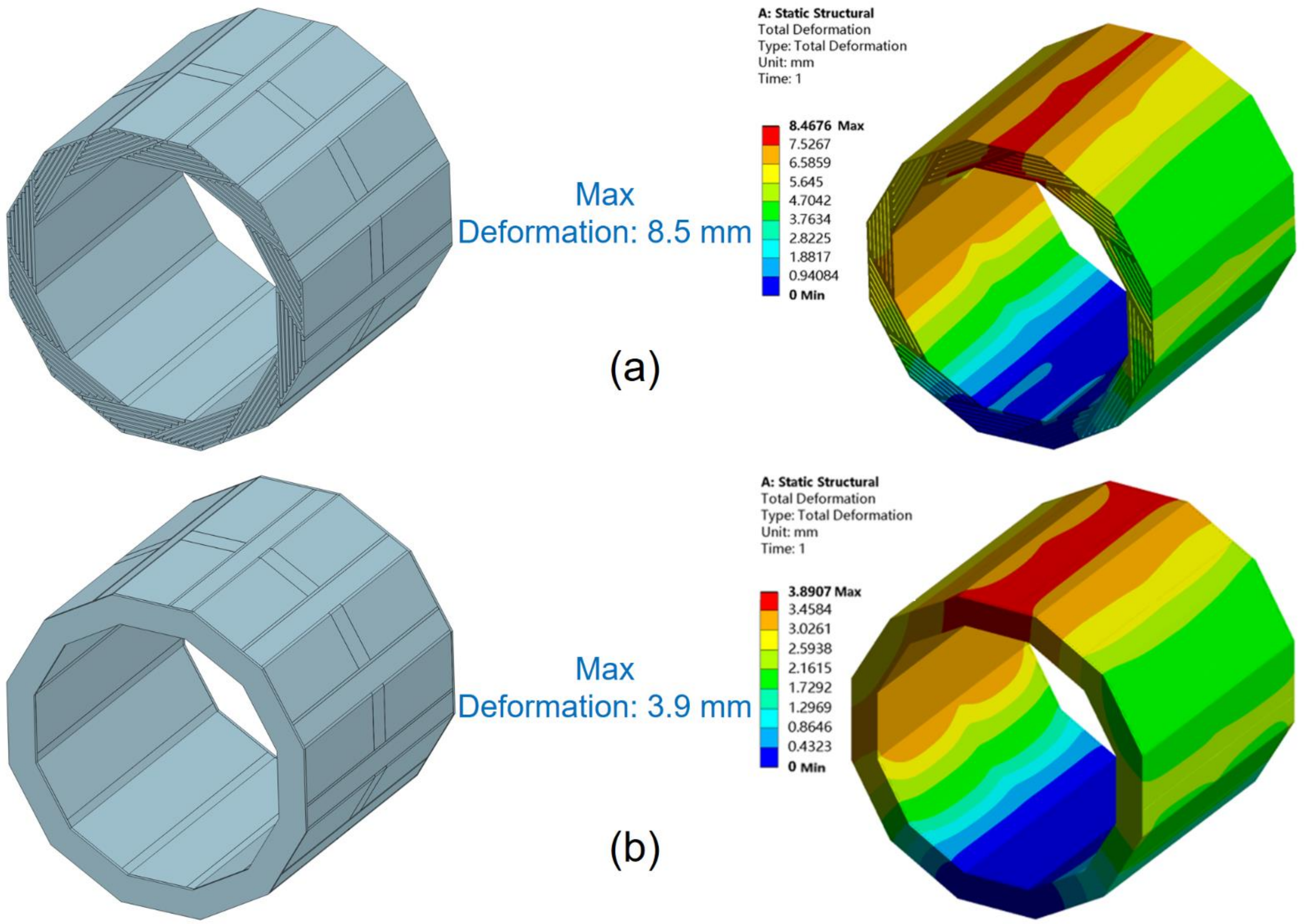

Figure 14.6: Overall deformation comparison of FEA results for the barrel yoke without and with the end flanges. (a): maximum deformation is 8.5 mm without the end flanges. (b): maximum deformation is 3.9 mm with the end flanges.

- The font is still small and the number of significant figures (digits) is still large
  - Reducing the number of figures to 2, would allow plenty of space to increase the font size.
  - BTW, the information provided in these plots could easily be reduced to text, or to the deformation figures, since the yoke is already shown with and without the flanges in figure 14.5
    - (The flanges are different between Fig. 14.5 and 14.6)

Chapter 14

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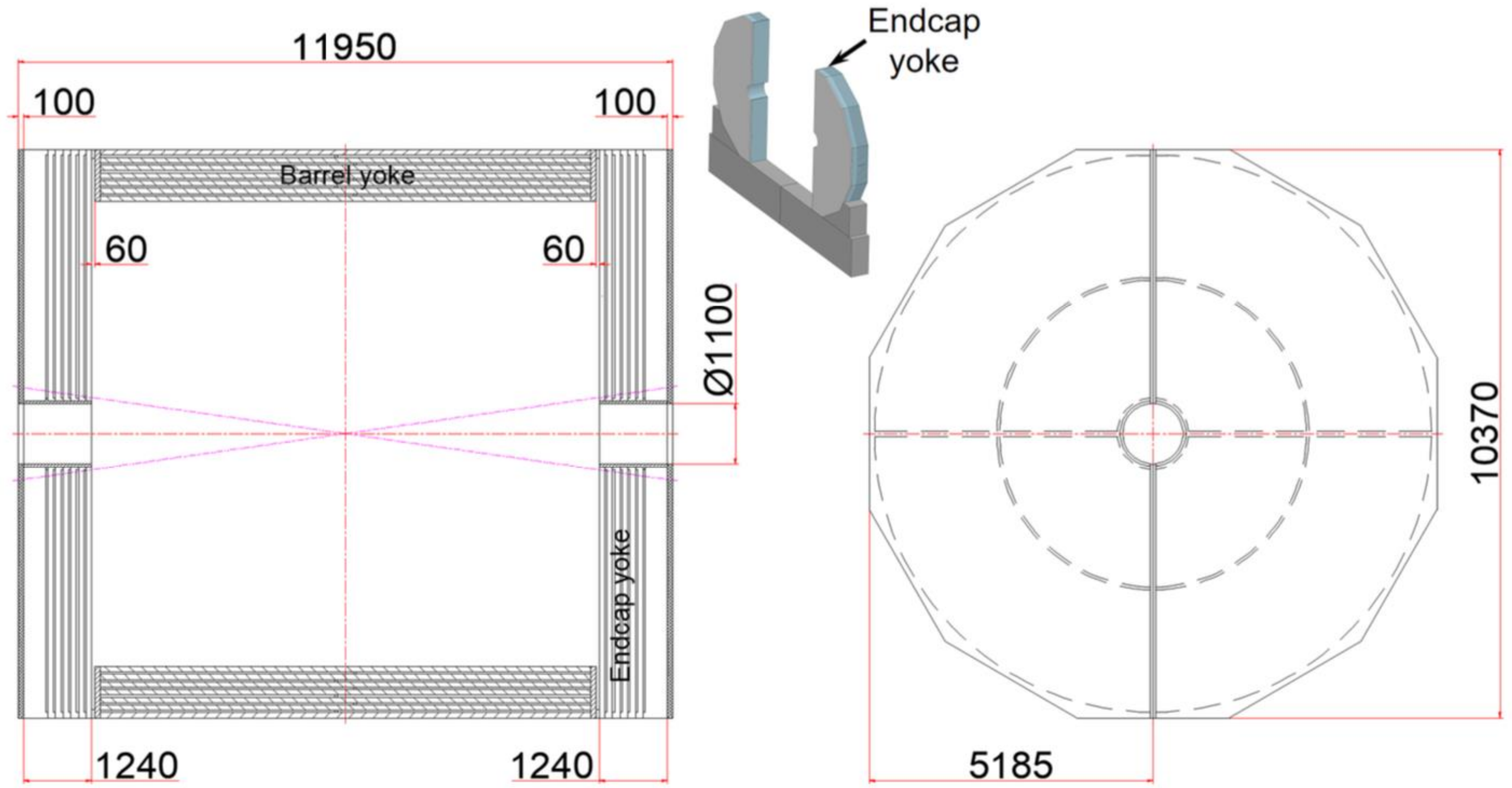

Figure 14.7: Endcap yoke dimension and location. The clearance between the endcap yoke and the barrel yoke is 60 mm for the internal sub-detectors' piping. (unit:mm)

- This figure for endcap yoke dimensions, actually has the barrel yoke dimensions as well.
- The dimensions on the location of the endcaps was already in previous plots. So, i don't see the point of the left plot.
- The small plot showing the endcap open, could provide information about how we open the endcap but it is not mention is either in the caption or text. Either remove or make the explicit point.
  - The fact that the endcap is split into two is made in the right drawing
- The clearance between barrel and endcap is not only for piping. I assume it is for pipes and cable.
  - **Suggestion**: The clearance of 60 mm between the endcap yoke and the barrel yoke serves as passage for the cables and pipes from the inner sub-detectors.

Chapter 14

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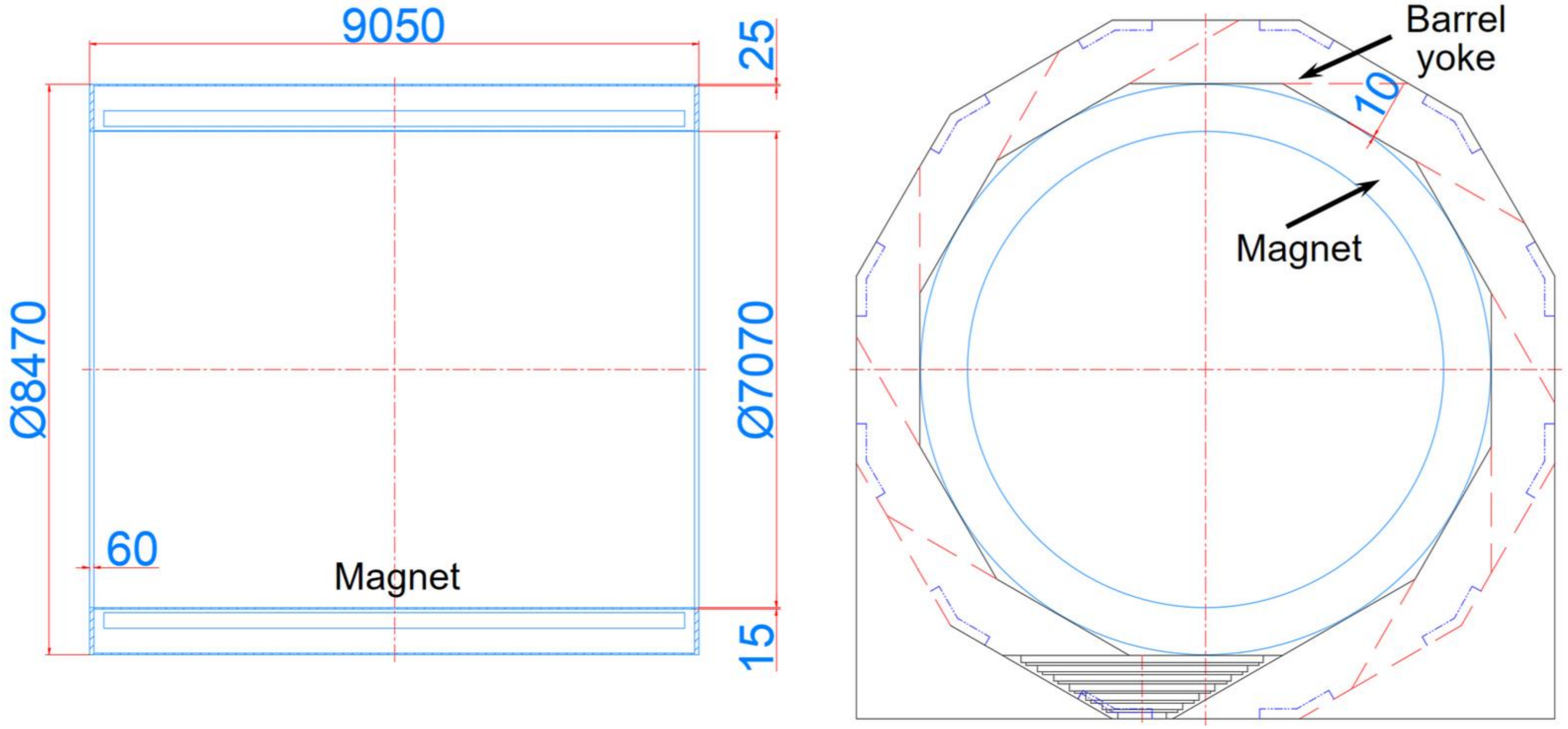

Figure 14.8: Boundary dimensions and location of the superconducting solenoid magnet. The minimum clearance with the barrel yoke is 10 mm. (unit:mm)

- This figure is also mostly a repeat from before
- Should add (a) and (b) in latex for better description
- “Boundary dimensions” is strange
  - **Suggestion**: Superconducting solenoid magnet positioning within the barrel yoke. (a) Dimensions of the solenoid; (b) The minimum clearance with the barrel yoke is 10 mm.

Chapter 14

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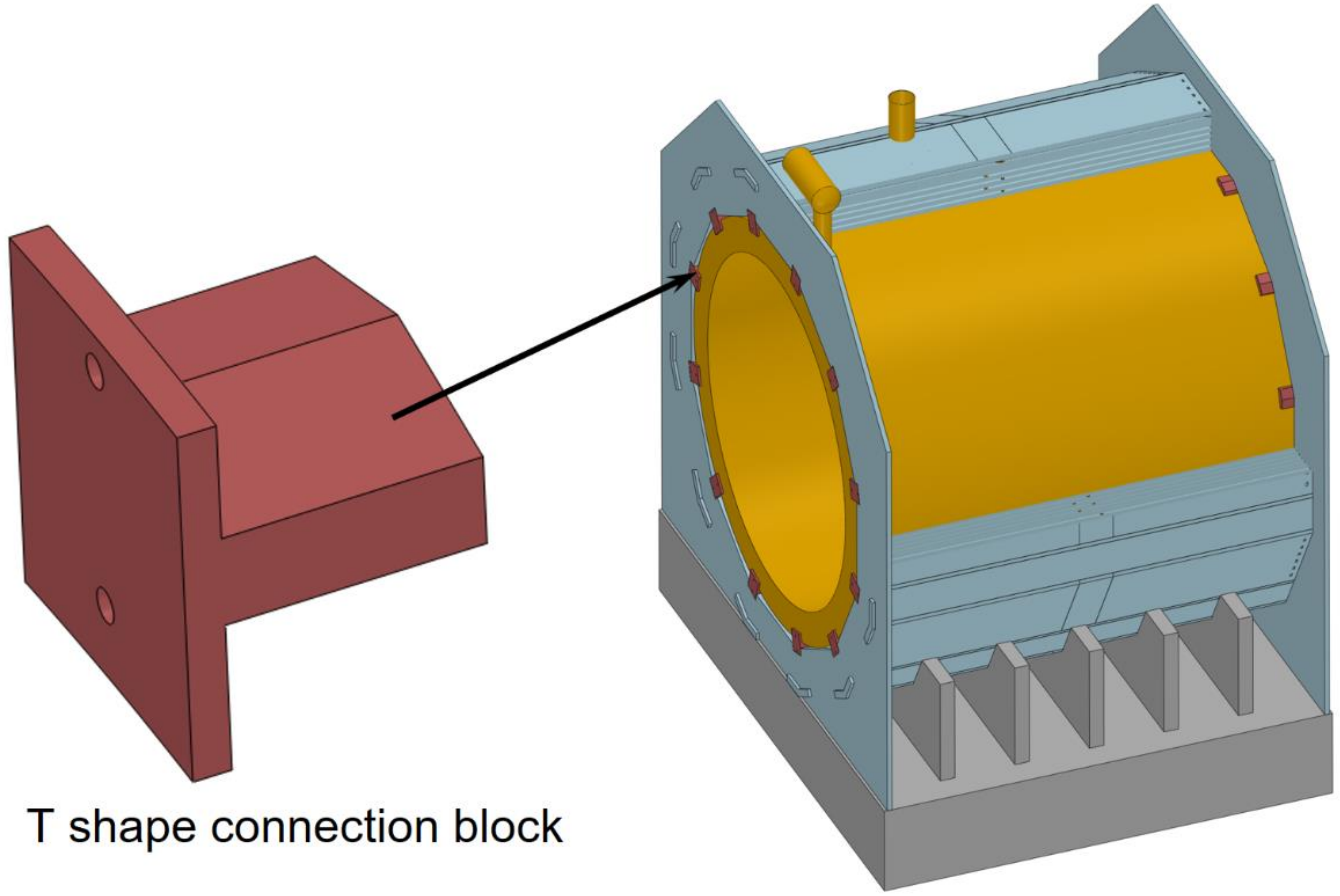

Figure 14.9: Connection structure of the superconducting solenoid magnet.

- Figure caption does not explain much about this connection, and the text does not reference this figure either

Chapter 14

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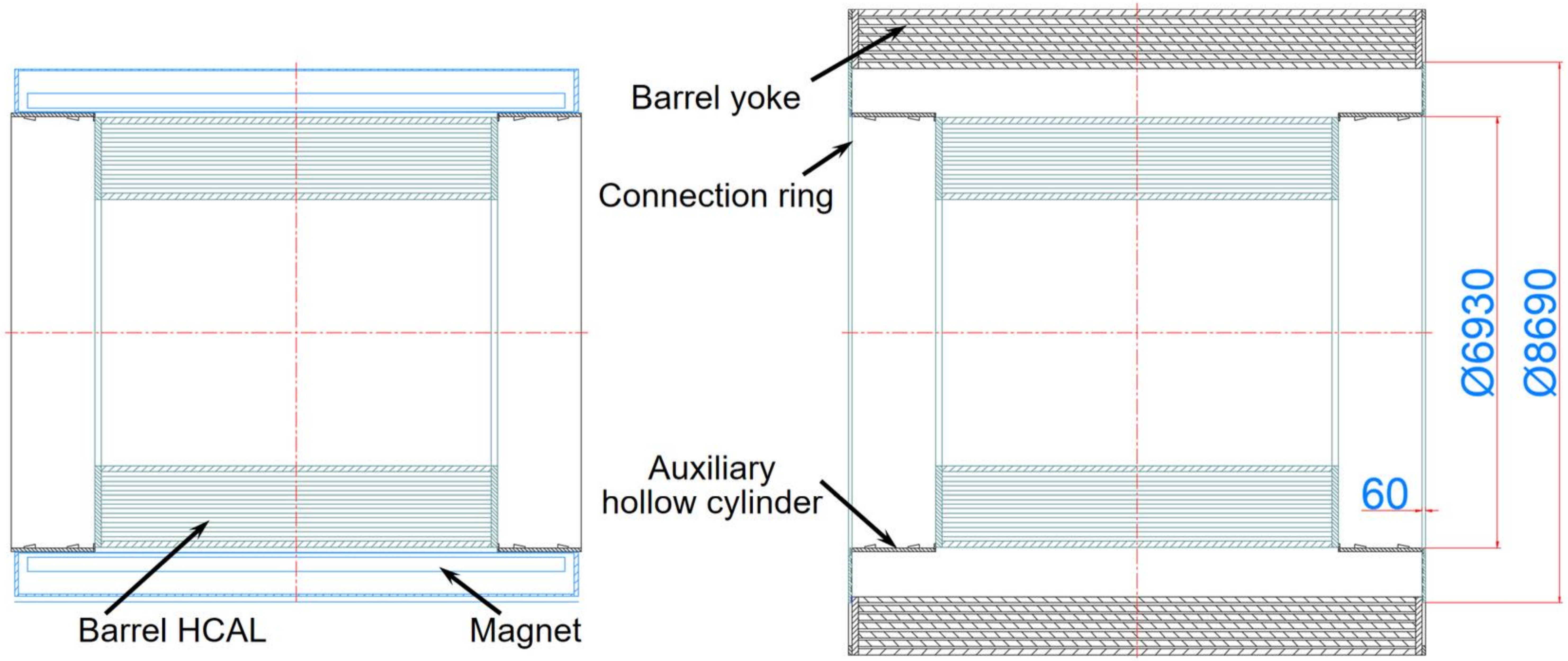

Figure 14.10: Location of the barrel HCAL. It is directly connected to the barrel yoke using the rings. (unit:mm)

- Not sure having another figure showing what has been shown before is that important.
- The figure should be split in (a) and (b)
- The caption can have english improved.
- The most interesting here is the "connection ring" but this figure does not really show them in any detail. It would be more useful to have a blow up of that.
  - That seems to be the same shown in Fig. 14.12

Chapter 14

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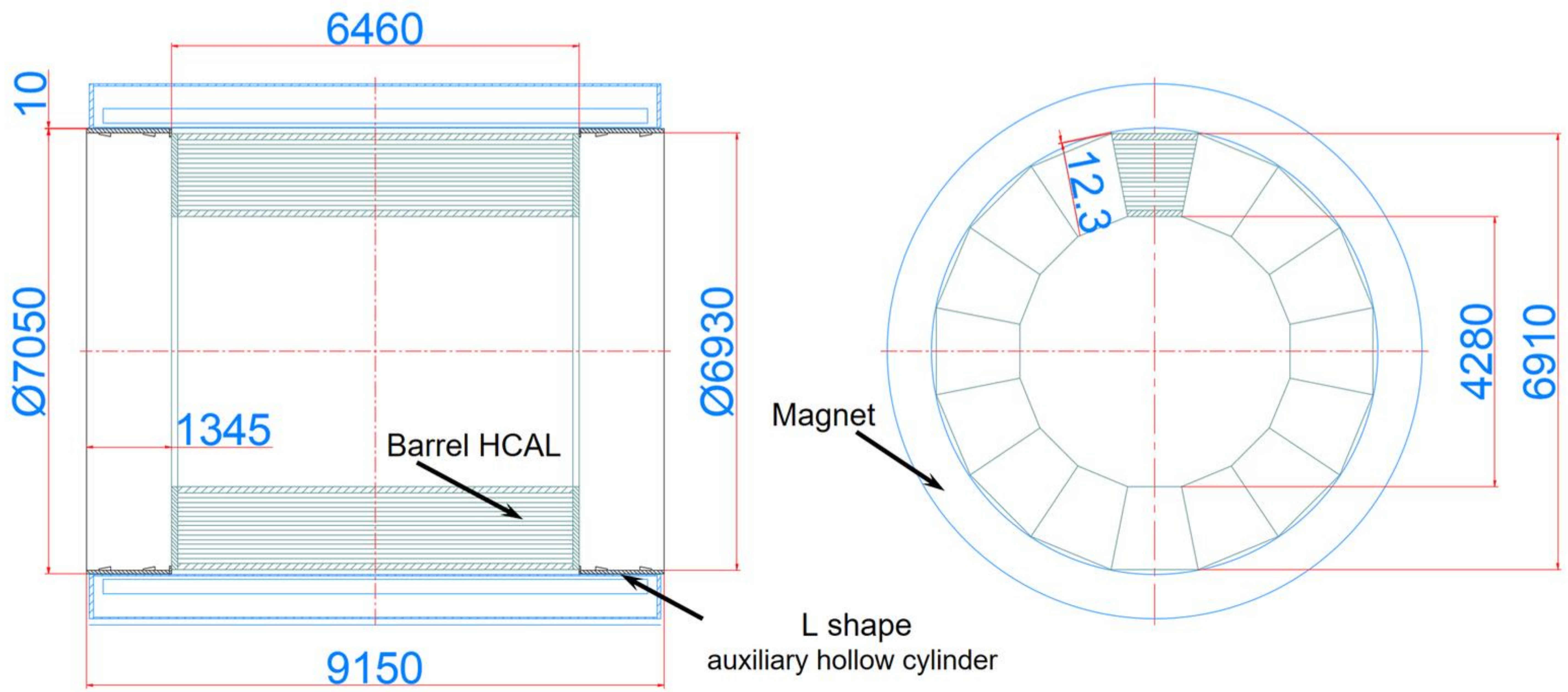

Figure 14.11: Boundary dimensions of the barrel HCAL. The L-shaped auxiliary hollow cylinders serve as both assembly fixture and the key connection interface, with 10 mm clearance between to the magnet. (unit:mm)

- This figure really could be merged with 14.10. The auxiliary hollow cylinder is already mentioned there. Make clear what this figure is adding
- The figure should be split in (a) and (b)
- The caption can have english improved. Don't use the term "boundary dimensions". This is not just the dimensions of the boundary.
- With all these plots it is still not clear to me how the barrel HCAL attaches to the Yoke.

Chapter 14

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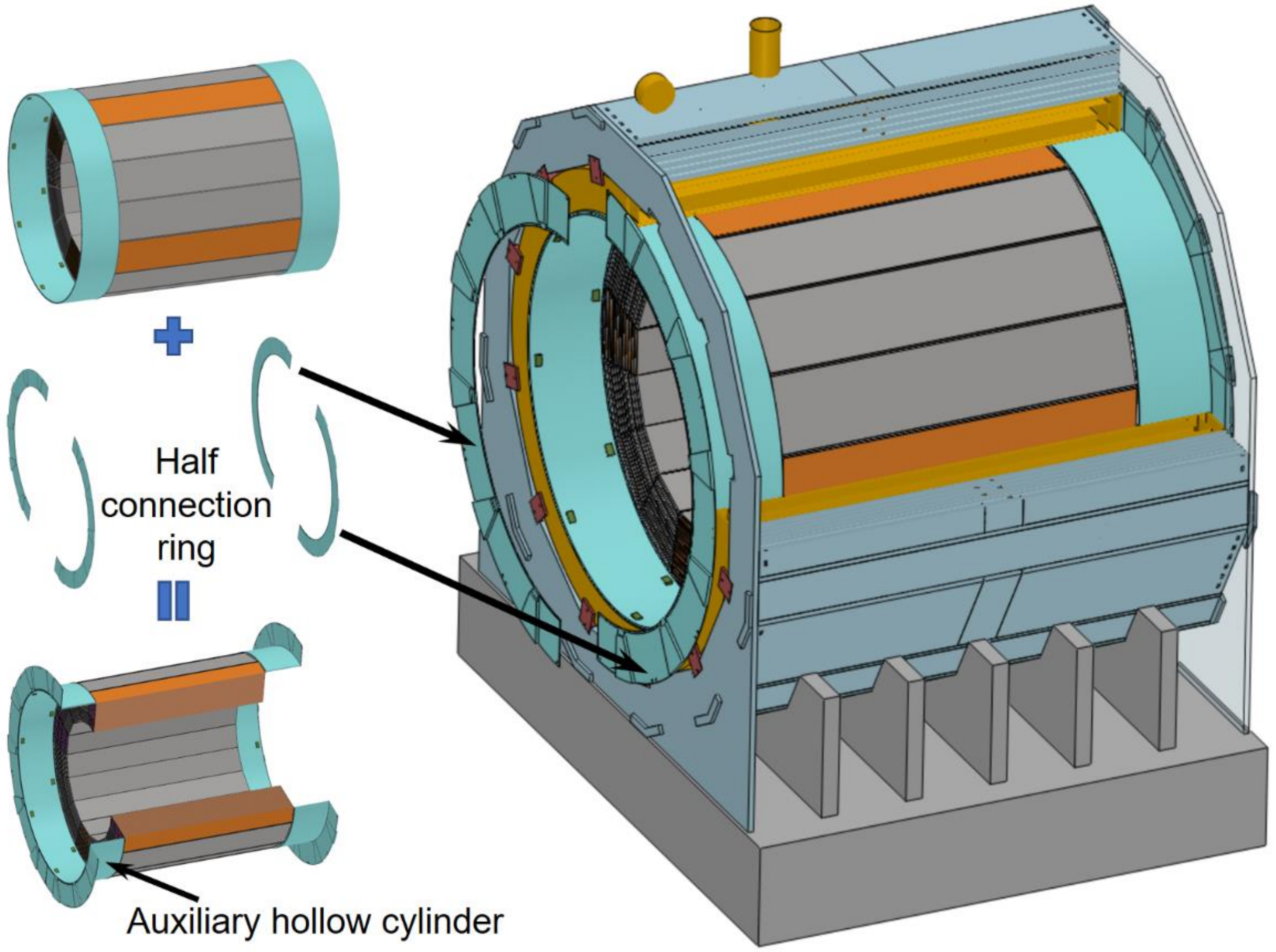

Figure 14.12: Connection structure of the barrel HCAL. Split rings with wire slots connect theHCAL auxiliary cylinder to the barrel yoke flange.

- Not clear what “wire slots” refers to
- Still not clear how the connection is effectively made

Chapter 14

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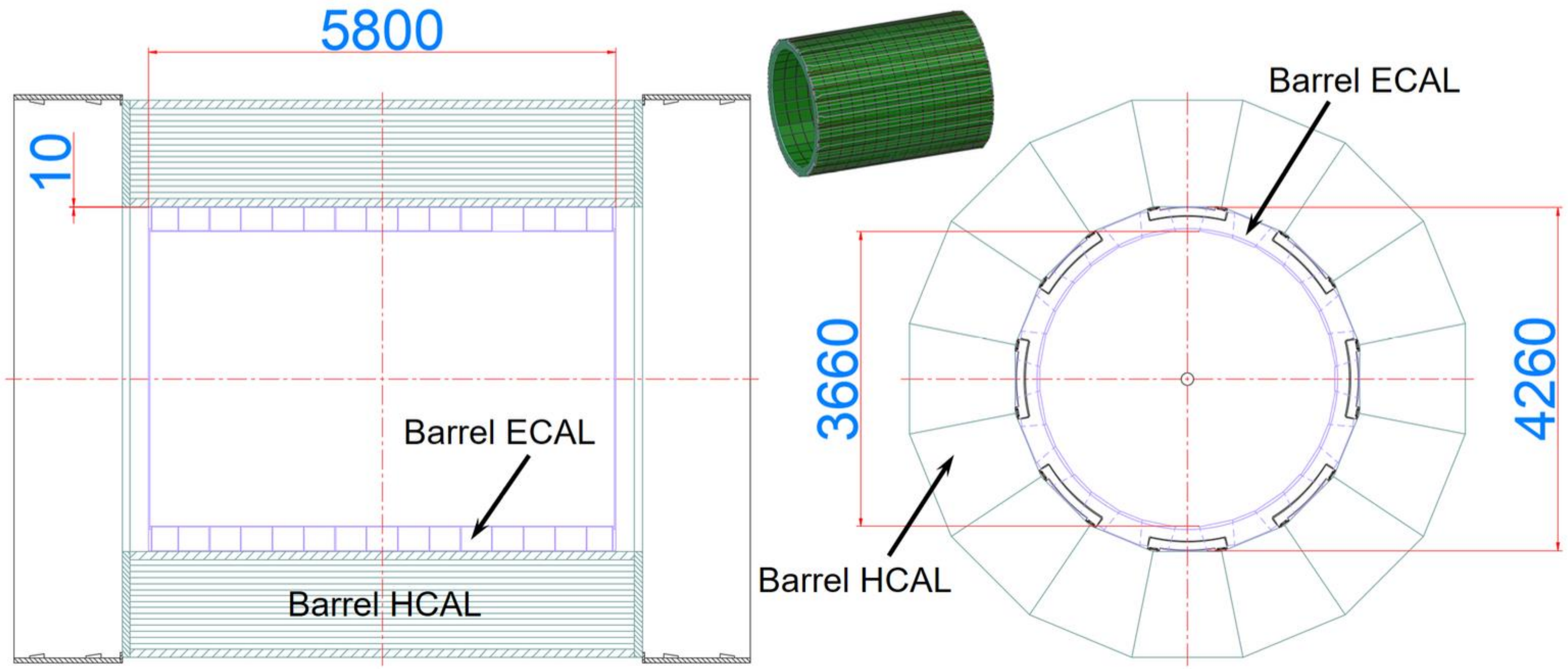

Figure 14.13: Boundary dimensions and location of the barrel ECAL. It is installed inside the barrel HCAL, with a minimum clearance of 10 mm. (unit:mm)

- The figure should be split in (a) and (b)
- There is no description of 8 black rectangular shapes on the ECAL that seem to be the only new features in this drawing
- The TDR is to support a physics project. It is more relevant to give the thickness of the ECAL, than two diameters and then making people doing that calculation
- 3D ECAL figure is not mentioned anywhere. It should be at least be mentioned in the caption, otherwise should be removed

Chapter 14

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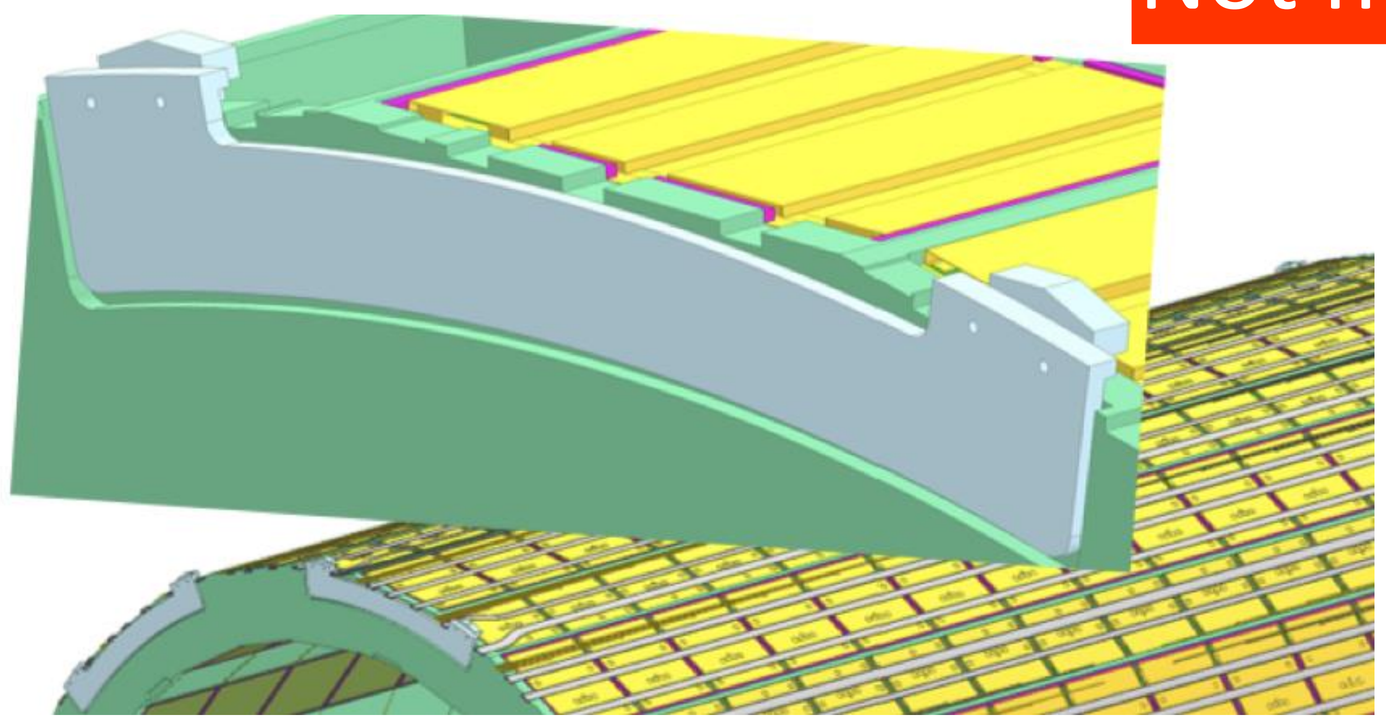

Fig 7.11 from ECAL

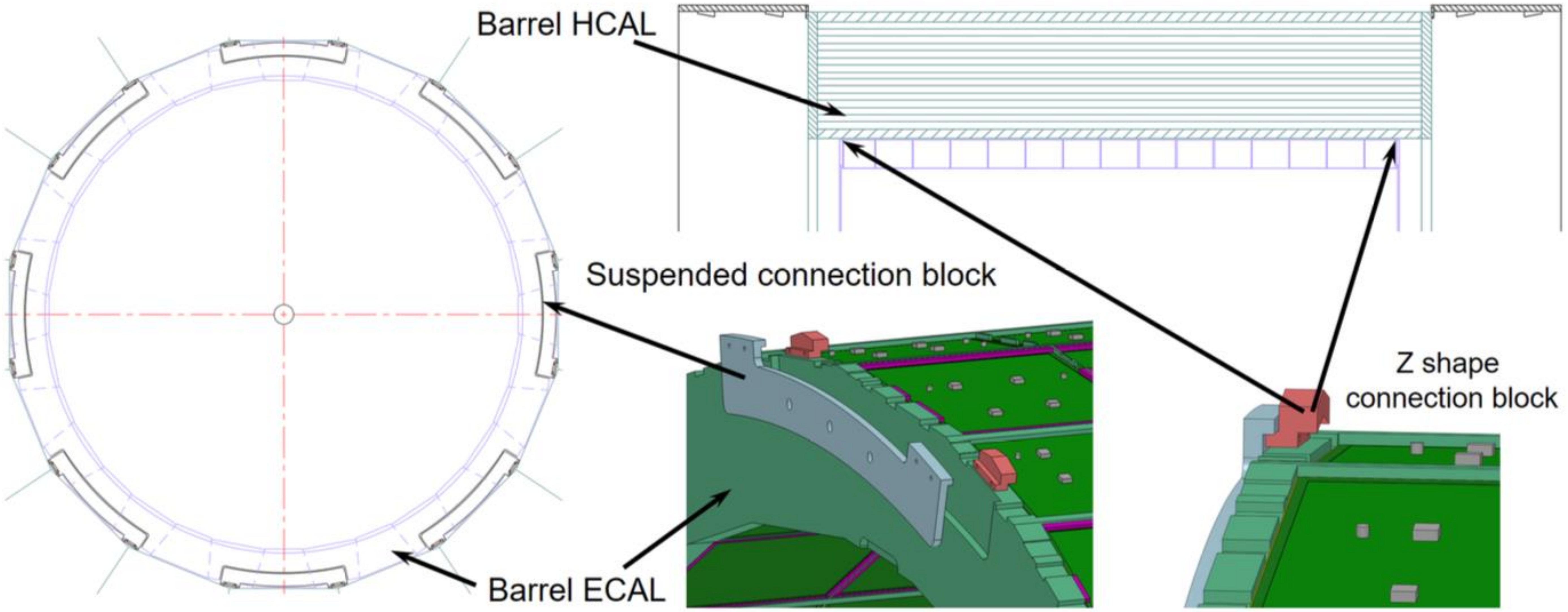

Figure 14.14: Connection structure of the barrel ECAL. Eight-point circular suspension structure are adopted to connect the barrel ECAL and the barrel HCAL.

- The 2D components on this figure are repeated from the previous figure, making it irrelevant
- Now the rectangular shapes first introduced in the previous picture are explained….. This is too late because they show up first in the 14.13
- The lighter green colored ring got me very confused. Having a different color than the rest of the ECAL seems to indicate this is a different part. Is this just a support structure, or an active part of the ECAL? Why the different color? We probably need to be more explicit in the caption
- This bracket and surface of ECAL are different between this chapter and the ECAL chapter, Fig. 7.11

Chapter 14

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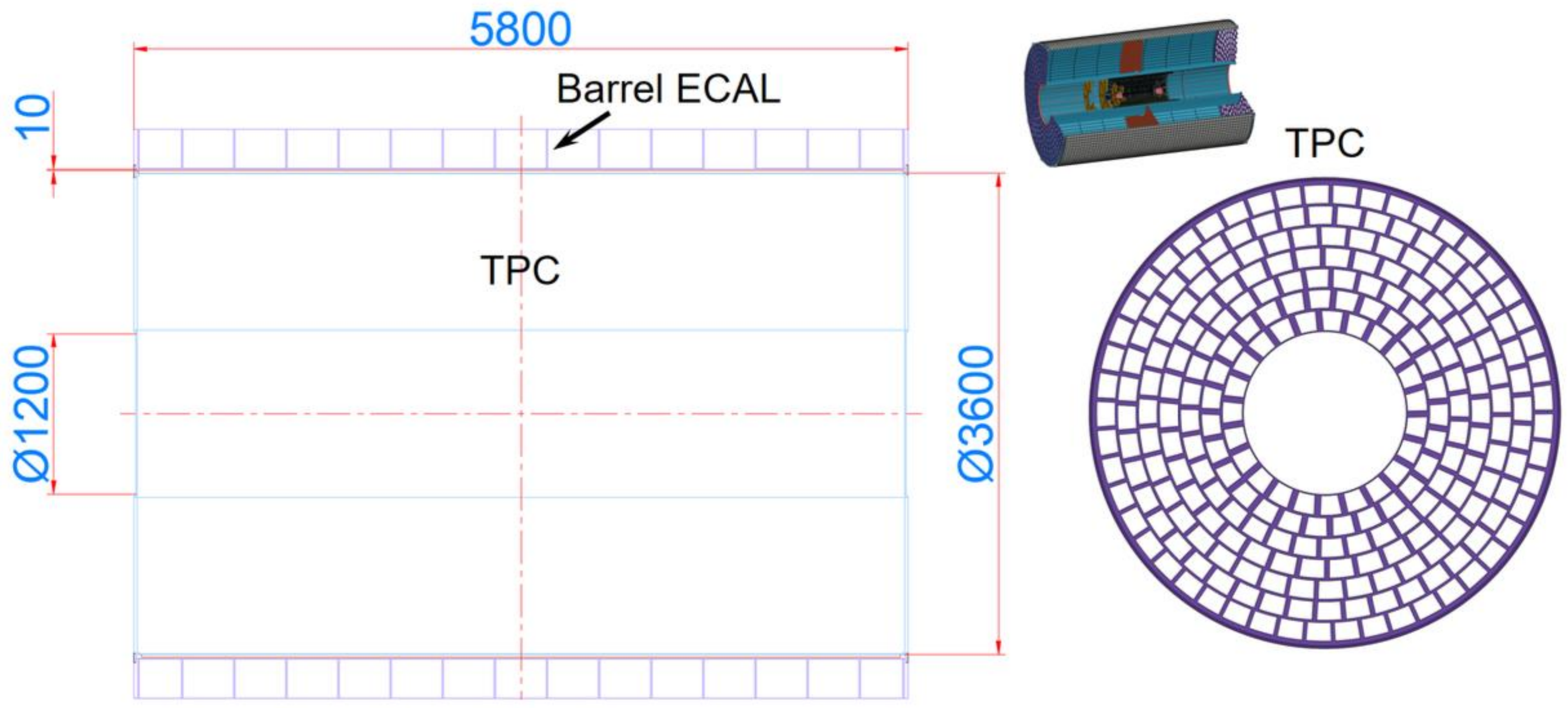

Figure 14.15: Boundary dimensions and location of the TPC. It is mounted inside the barrel ECAL with a minimum clearance of 10mm. (unit:mm)

- Comments similar to the other similar pictures
- The figure should be split in (a) and (b)
- 3D TPC figure is not mentioned anywhere. It should be at least be mentioned in the caption, otherwise should be removed. I don't think it is particularly needed.

Chapter 14

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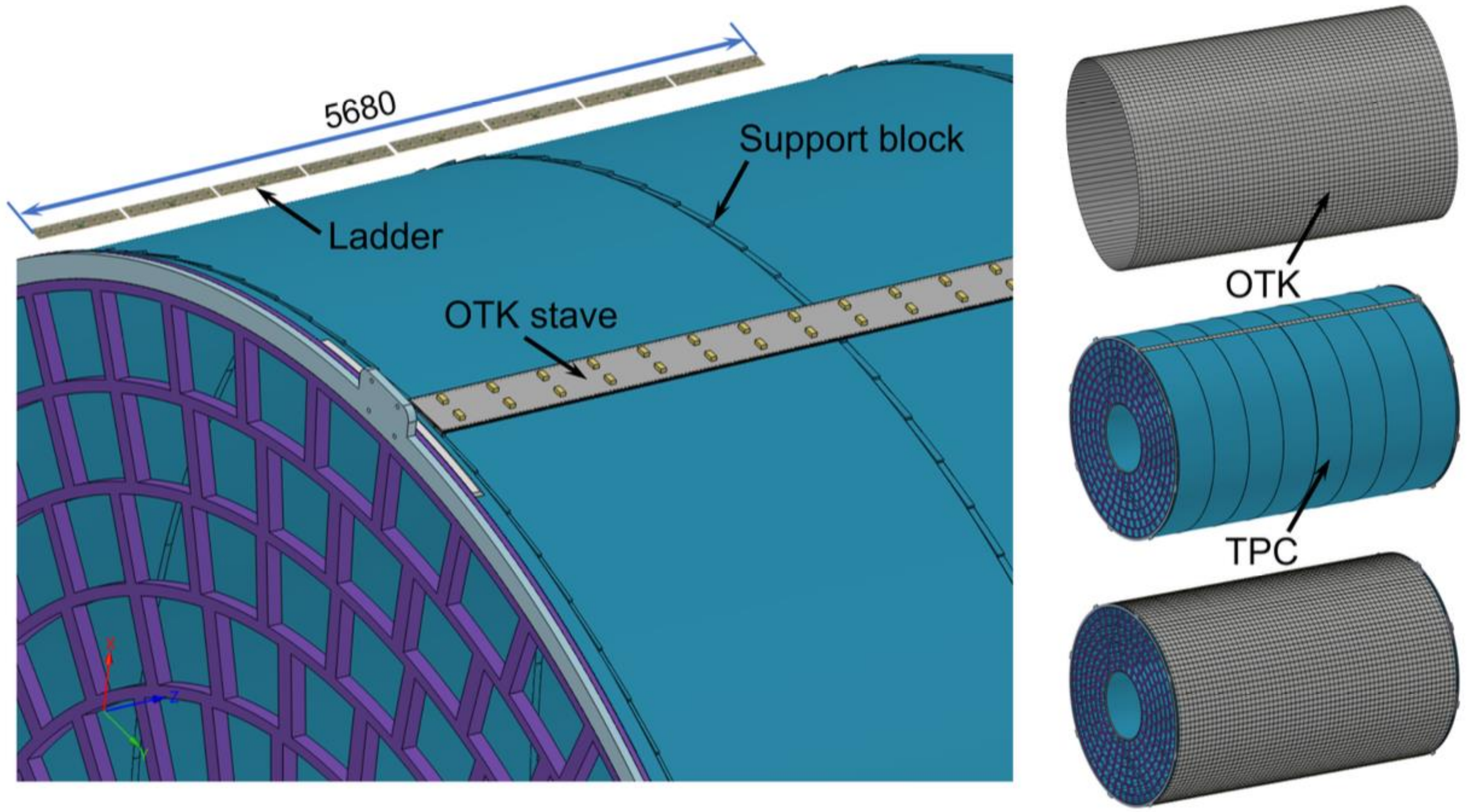

Figure 14.17: Connection structure of the barrel OTK. The barrel OTK contains 110 staves with a total length of 5680mm, each stave is divided into 8 ladders, the ladders are fixed to the outer cylinder of the TPC by support block. The barrel OTK will be assembled with TPC for integrated installation. (unit:mm)

- This figure is nice.
- Check if the information in this figure caption is consistent with the tracker chapter

Chapter 14

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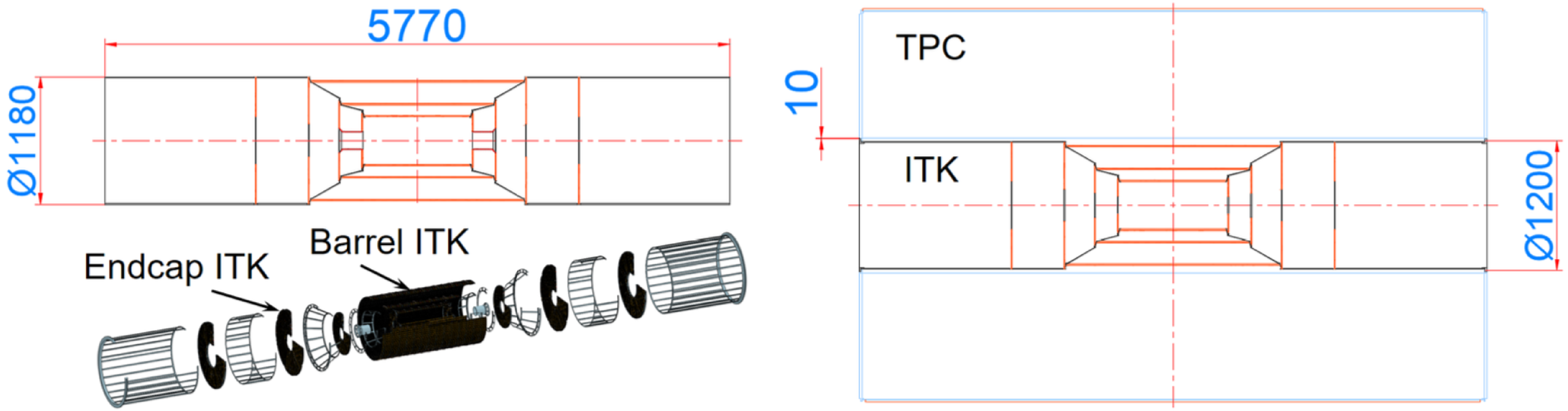

Figure 14.18: Boundary dimensions and location of the ITK. ITK is located inside TPC with a 10mm clearance, total length of it is 5770mm and the outer diameter is 1180mm. (unit:mm)

- Figure should have an (a), (b) division
- The top left figure is completely redundant. Just add the length of the detector to the left drawing and all the other information is the same
    - Too many figures will confuse readers… they don't help
- Don't use red lines for the detector elements since you are using red for the lines indicating the dimensions

Chapter 14

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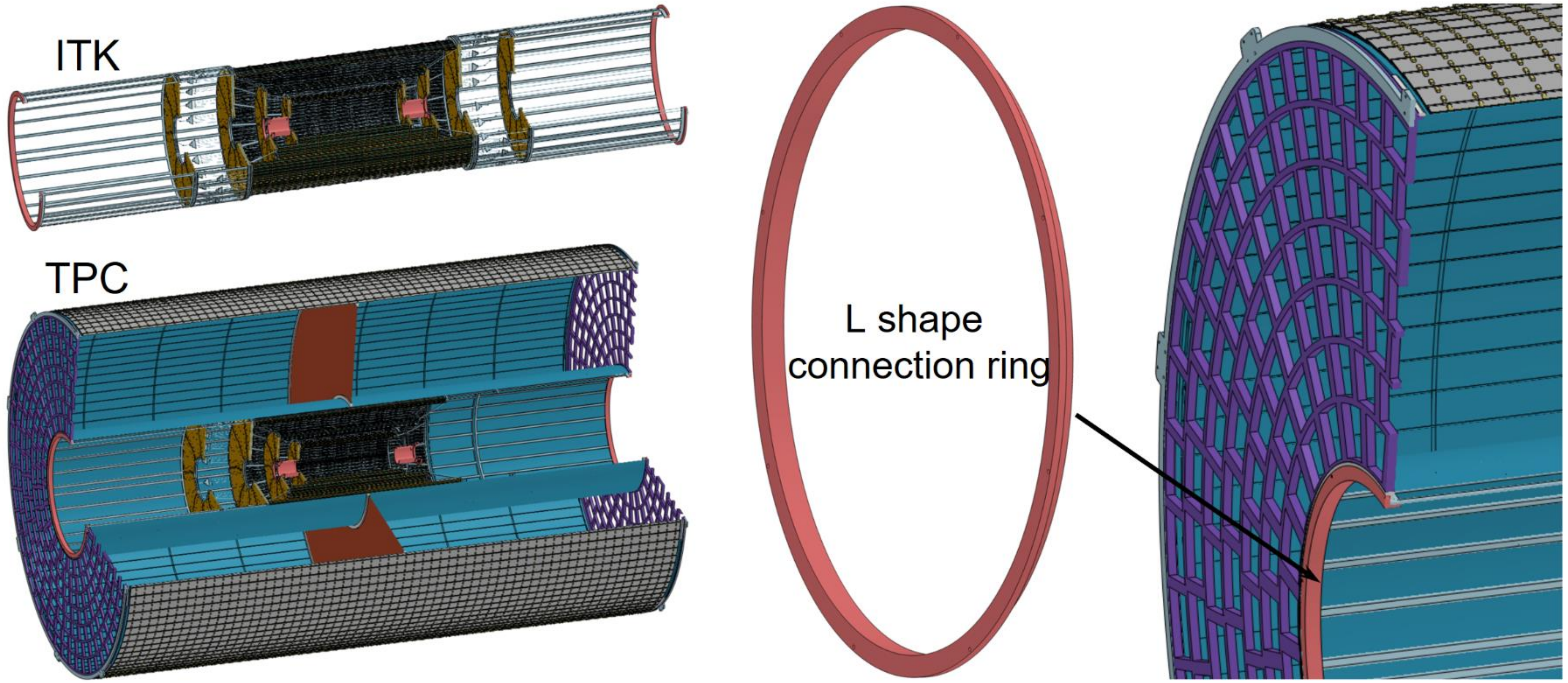

Figure 14.19: Connection structure of the ITK. The L shape rings at both ends connect the ITK to the TPC

- Figure is ok, but i would prefer to see details on how the L shape ring actually connects, and how the cables will exit through it. The TPC closes cable exit above, so i guess, they go below…
- What about details on the rod structure connecting to the ring? That is a key mechanical aspect of the detector

Chapter 14

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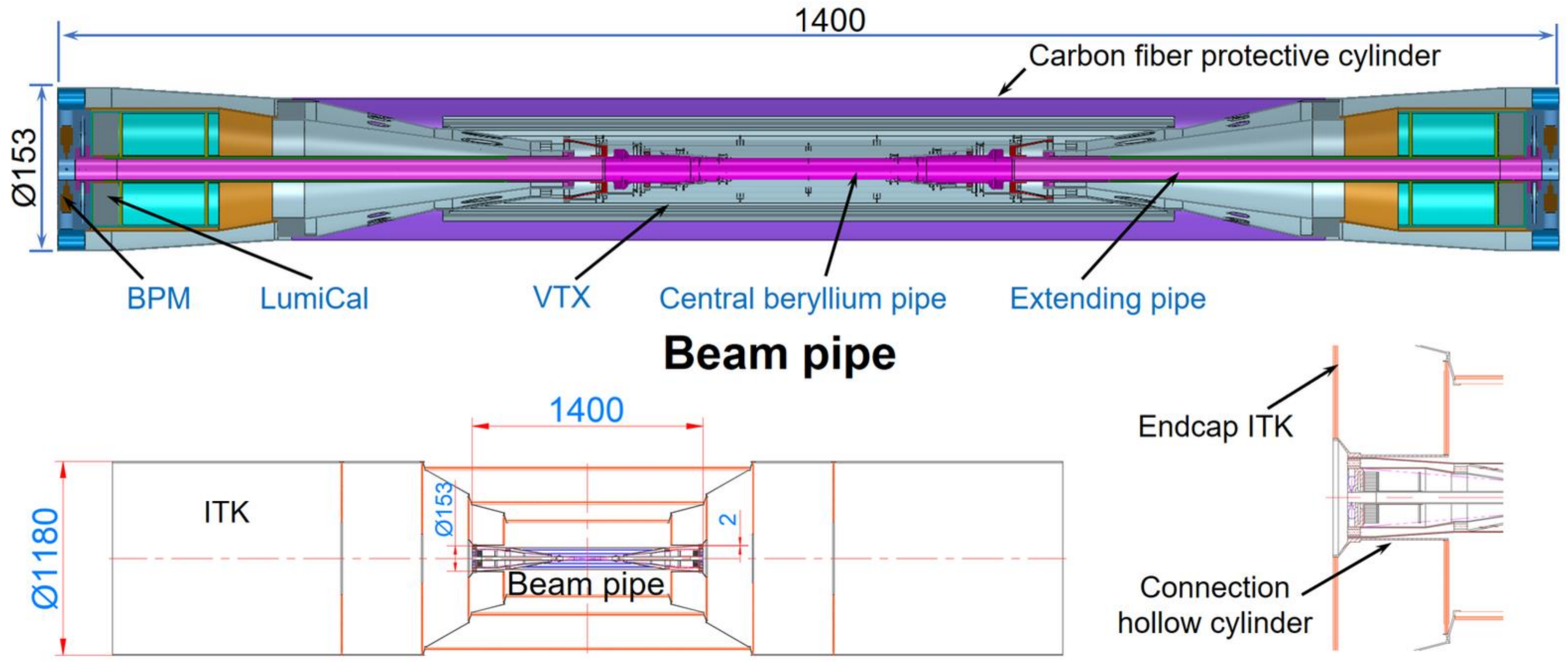

Figure 14.20: Boundary dimensions and location of the beam pipe. The beam pipe is located inside the ITK with 2mm clearance, the length of it is 1400mm and the outer diameter is 153mm. (unit:mm)

- This structure it is NOT the beam pipe. This structure includes the vertex detector. We can call it the "Beam pipe assembly" for lack of a better name.
  - Please change here, and everywhere in all drawings that this shows up
- Don't use red lines for the detector elements. It becomes very confusing since the dimension lines are also red
- This drawing is very complex and the explanation is not detailed enough. The details inside the connection cone could be left for Fig 14.21 where it shows up again. It should be only in one Figure and it should be explained.
- One could also split this figure into several, with the detail inside the cone as a separate figure

Chapter 14

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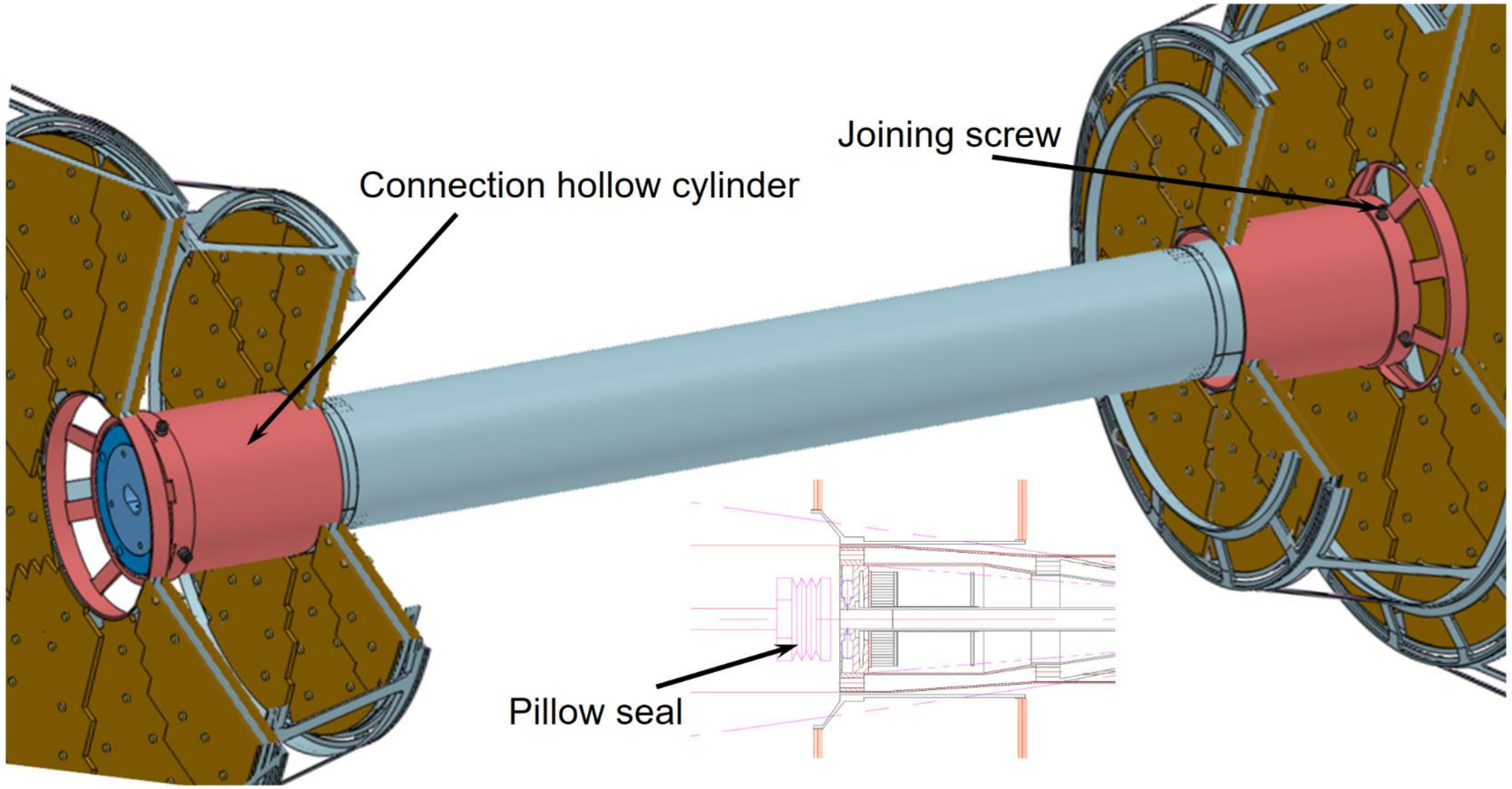
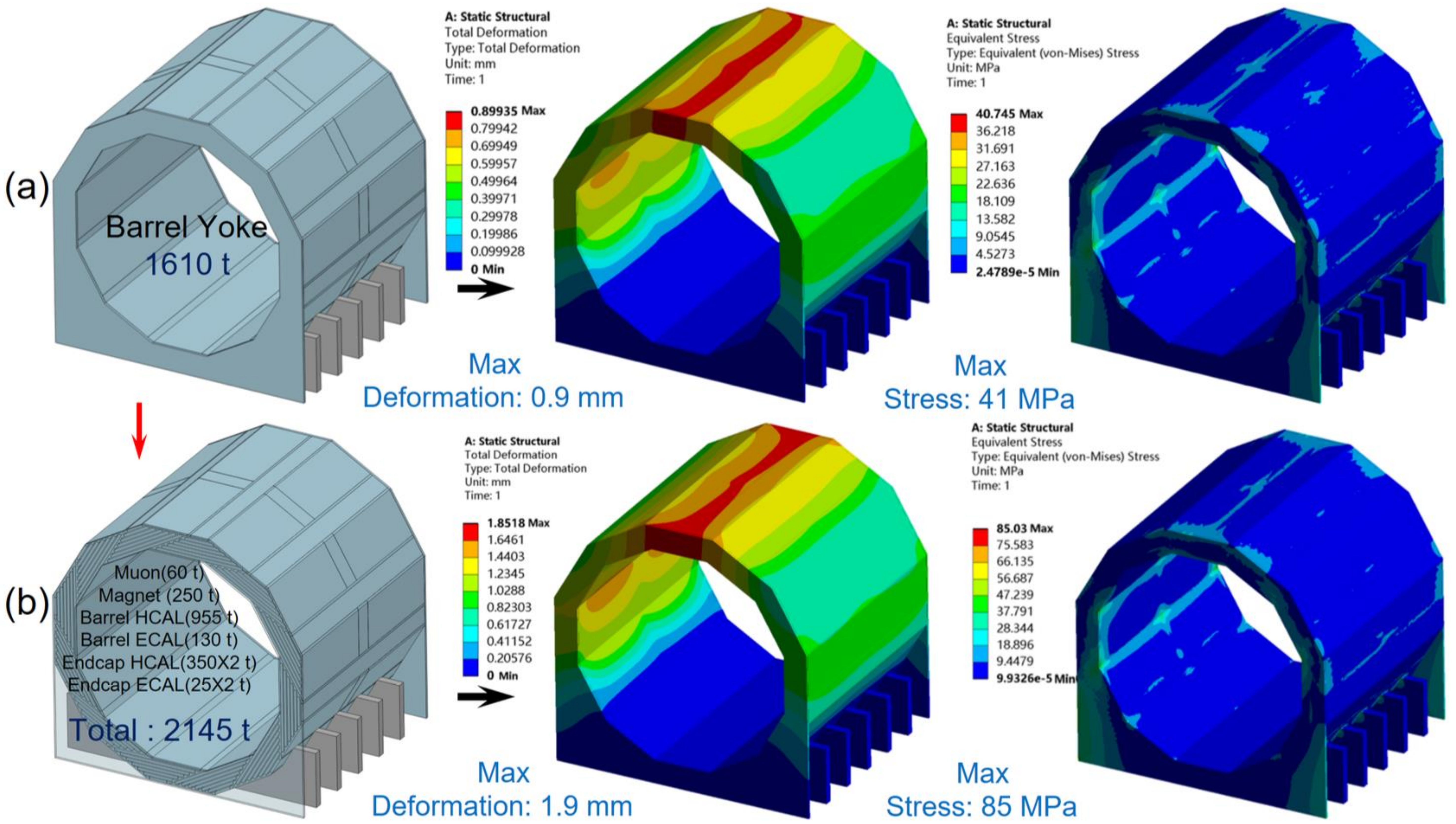


Figure 14.21: The connection between the beam pipe and vacuum pipe components of the accelerator is a special vacuum connection method, by the automatic compensation connection of the pillow seal.

- The insert figure is very complicated and not explained much.
- What is a “special vacuum connection method”
- What is a pillow seal? This term is used without explanation
- The support structure of the ITk/OTK is not explained

Chapter 14



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- End flange in this figure is different from figure 14.6.
- The bottom left figure does not show the detectors, so it is misleading in this case, since you want to consider the sub-detectors (why is the flange transparent here?)
- The font is still too small in the four right plots and the number of significant figures (digits) is still large
  - Reducing the number of figures to 2, would allow plenty of space to increase the font size.
- The weight of the elements should be provided in the figure. It should be in the text. Don’t write text on over figures. The text “Electromagnetic force” has no relation to the drawing (the figure is the same with or without electromagnetic force). That information in the caption is enough.

Chapter 14

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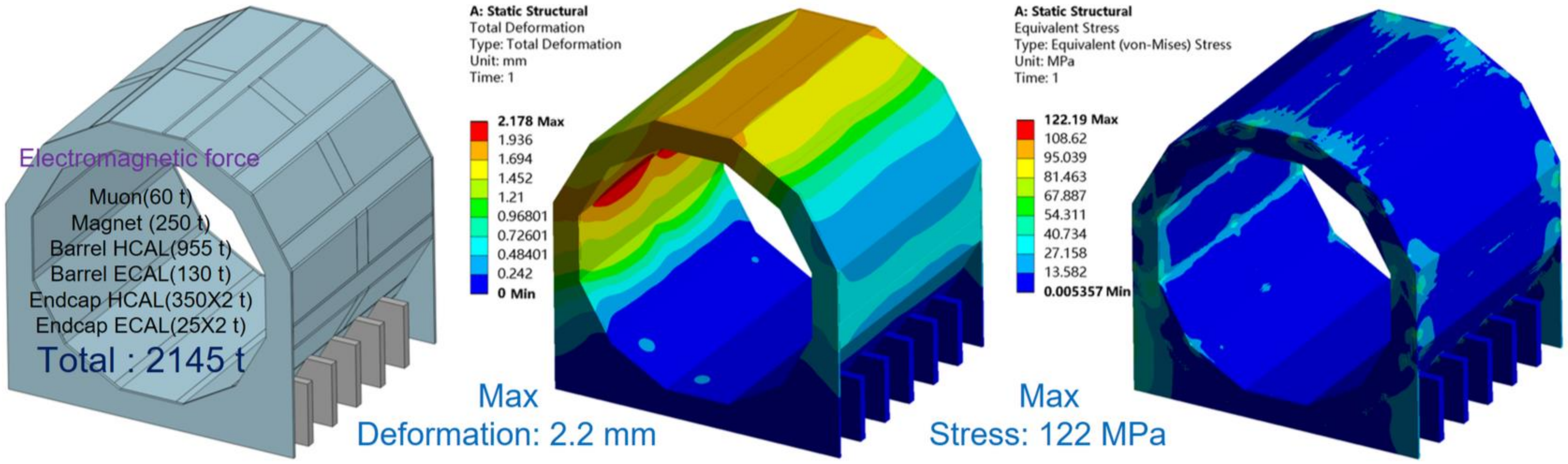

Figure 14.27: Deformation and stress of the barrel yoke under the electromagnetic force load with sub-detectors condition.

- End flange in this figure is different from figure 14.6.
- The left figure does not show the detectors, so it is misleading in this case, since you want to consider the sub-detectors (why is the flange transparency different in this figure when compared to 14.26? Should stick with one solution)
- The font is still too small in the two right plots and the number of significant figures (digits) is still large
  - Reducing the number of figures to 2, would allow plenty of space to increase the font size.
- Use (a), (b) and (c)
- The weight of the elements should be provided in the figure. It should be in the text. Don't write text on over figures. The text "Electromagnetic force" has no relation to the drawing (the figure is the same with or without electromagnetic force). That information in the caption is enough.

Chapter 14

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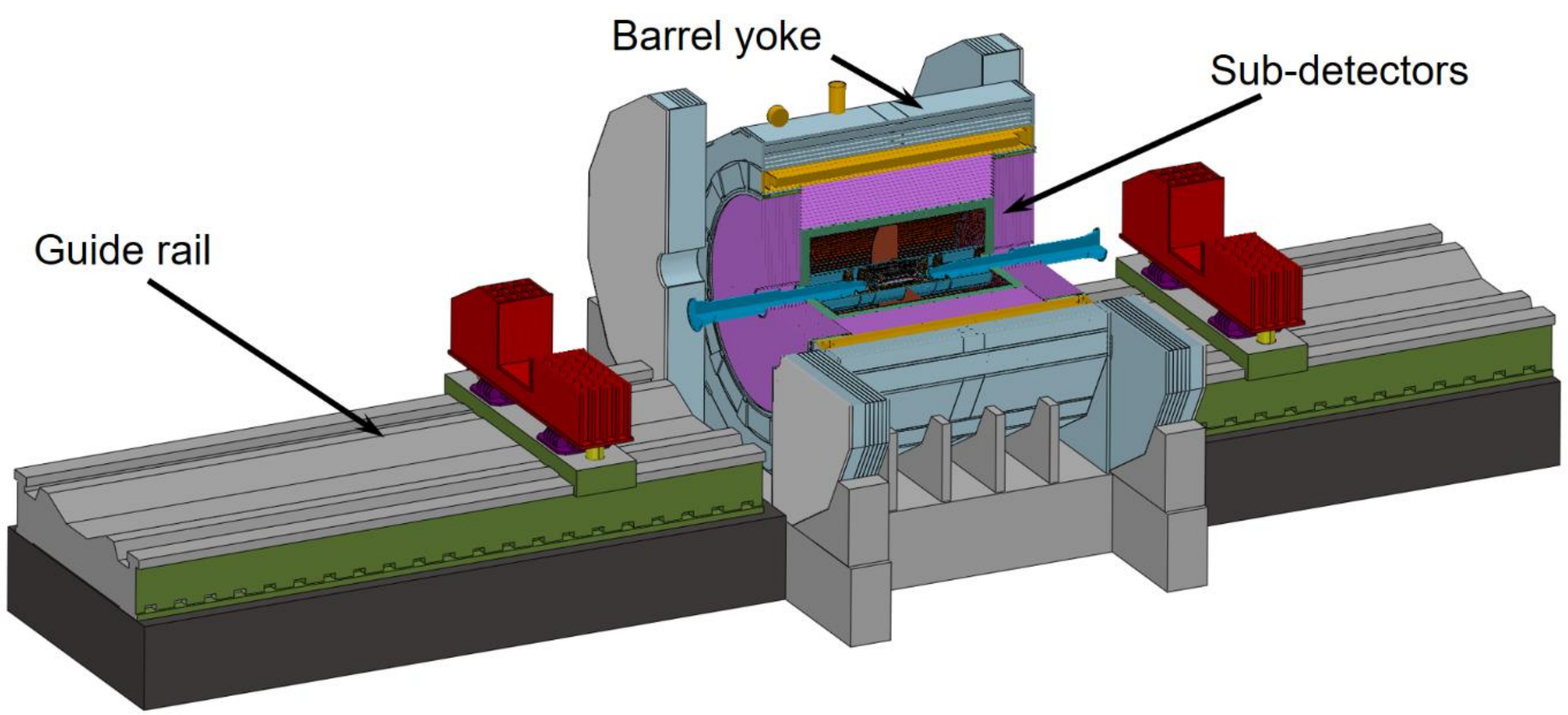
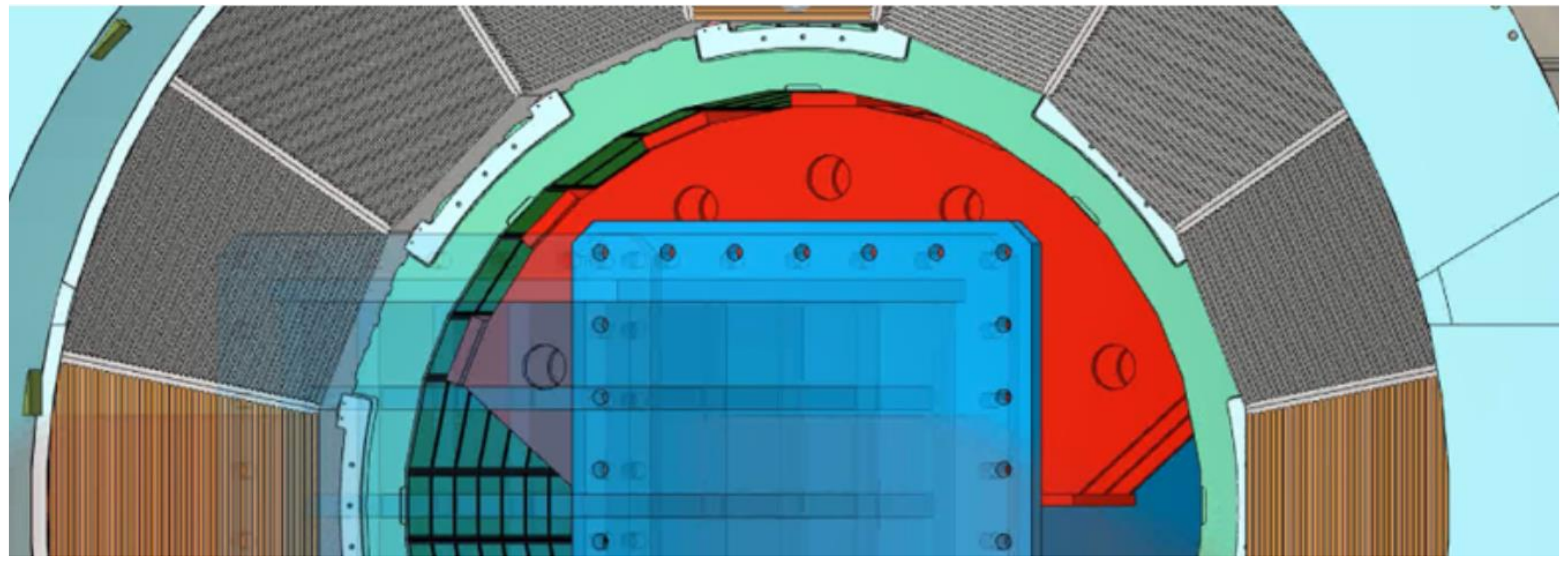


Figure 14.30: Detector installation in the underground experimental hall. The assembled sub-detectors will be pushed into the barrel yoke one by one along the guide rails.

- Another picture that is not needed
  - The only new elements are the guide rail and the red support structures that are not even mentioned in the caption (because it is too early to do so)
  - The information in this picture can be said in words. You have figures 14.31, 14.32, etc so
  - It would make more sense to show this figure at the end, once the full detector is assembled, if you insist in keeping it

Chapter 14



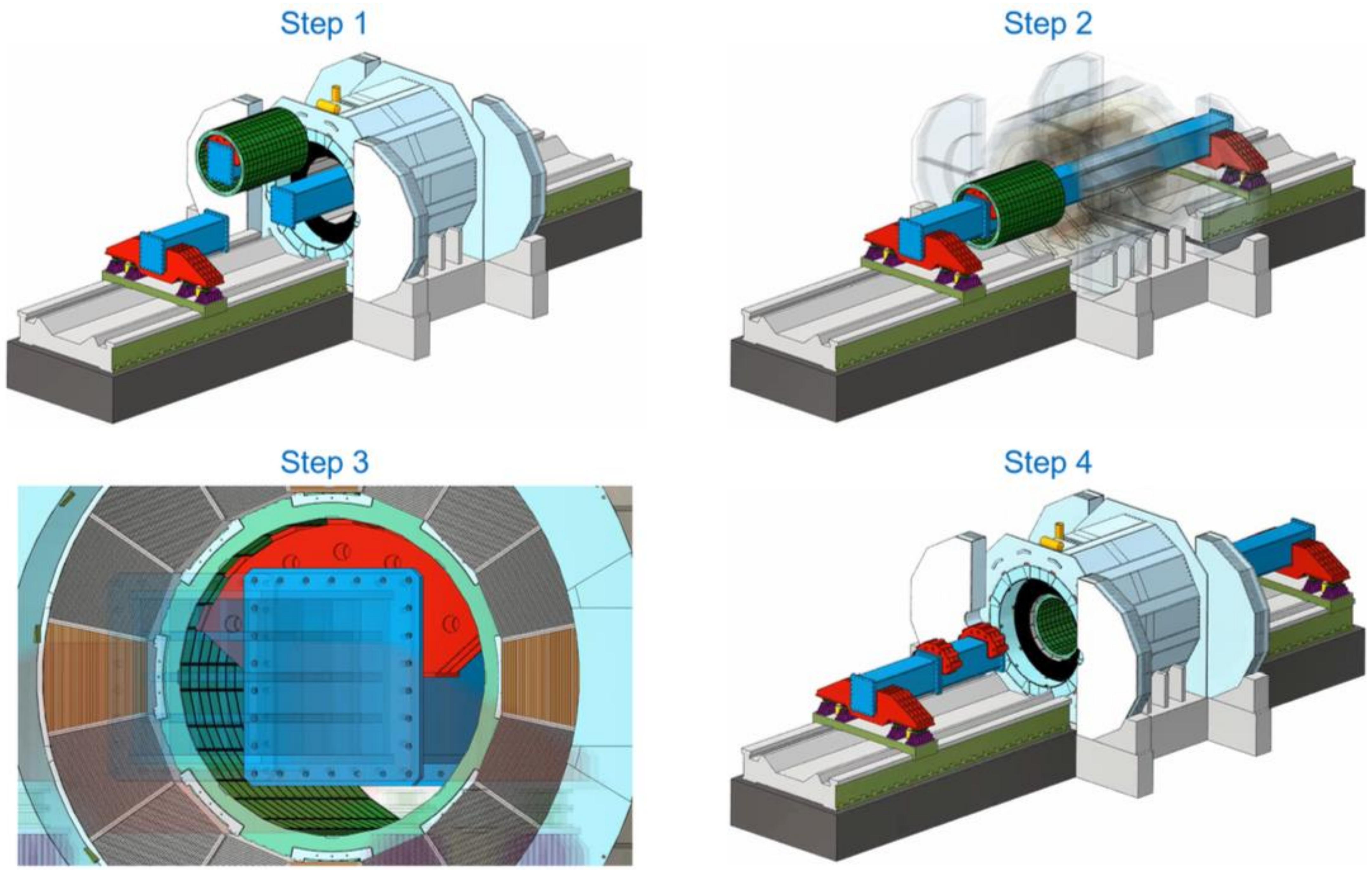


Figure 14.35: Installation process for the barrel ECAL. The barrel ECAL will be assembled with the middle-section shaft and then lifted to connect with other shaft sections.

- How is the red structure attached to the ECAL. Figure seems to show it connected directly to the interior of the crystal modules

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Chapter 14

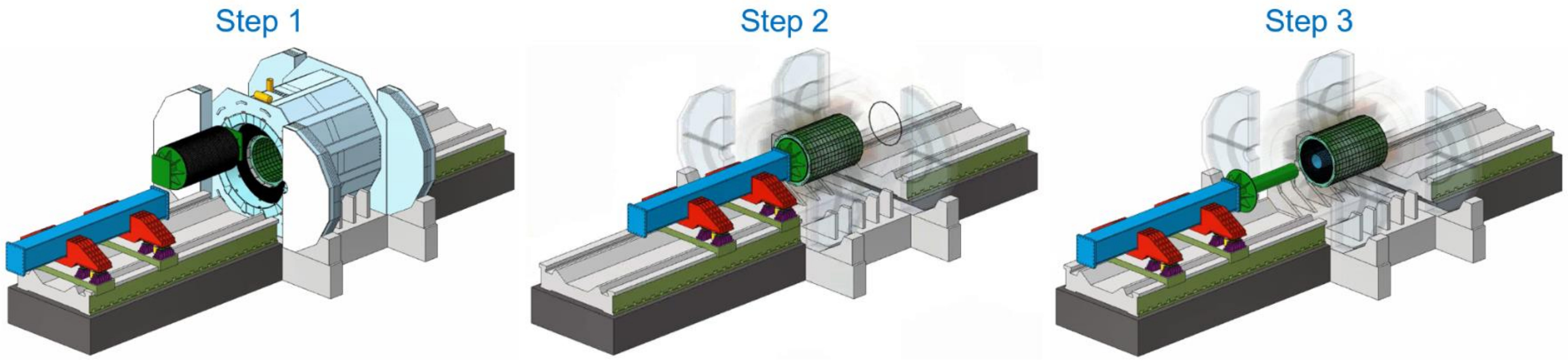

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Figure 14.38: Installation process for the TPC. It will be secured to the side of the long shaft and then pushed into designed place.

- How is the green support structure attached to the TPC frame? Provide detailed figure.
  - How are TPC cables handled during installation?

Chapter 14

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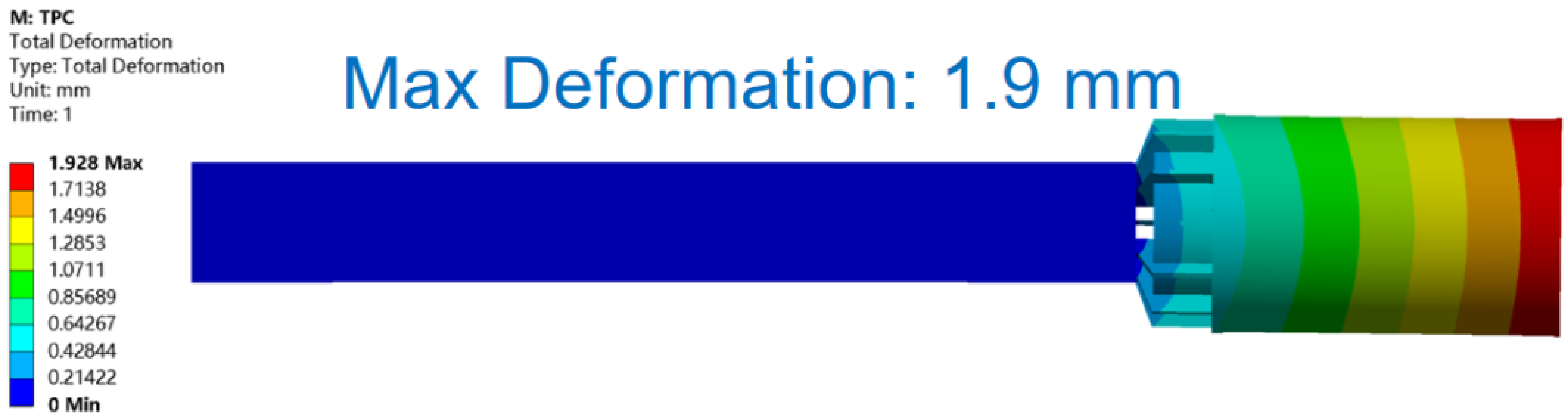

Figure 14.39: The simulation result of TPC cantilever installation.

- Same problem as other plots of this type
  - The legend font is too small and the number of significant figures is too large.
- Fig. 14.39: How is the attachment to the TPC treated in the FEA? It seems strange that there is no deformation difference at the boundary of the tool and the TPC
  - The tool seem solid in Fig. 14.38, but here it seems to be hollowed

Chapter 14

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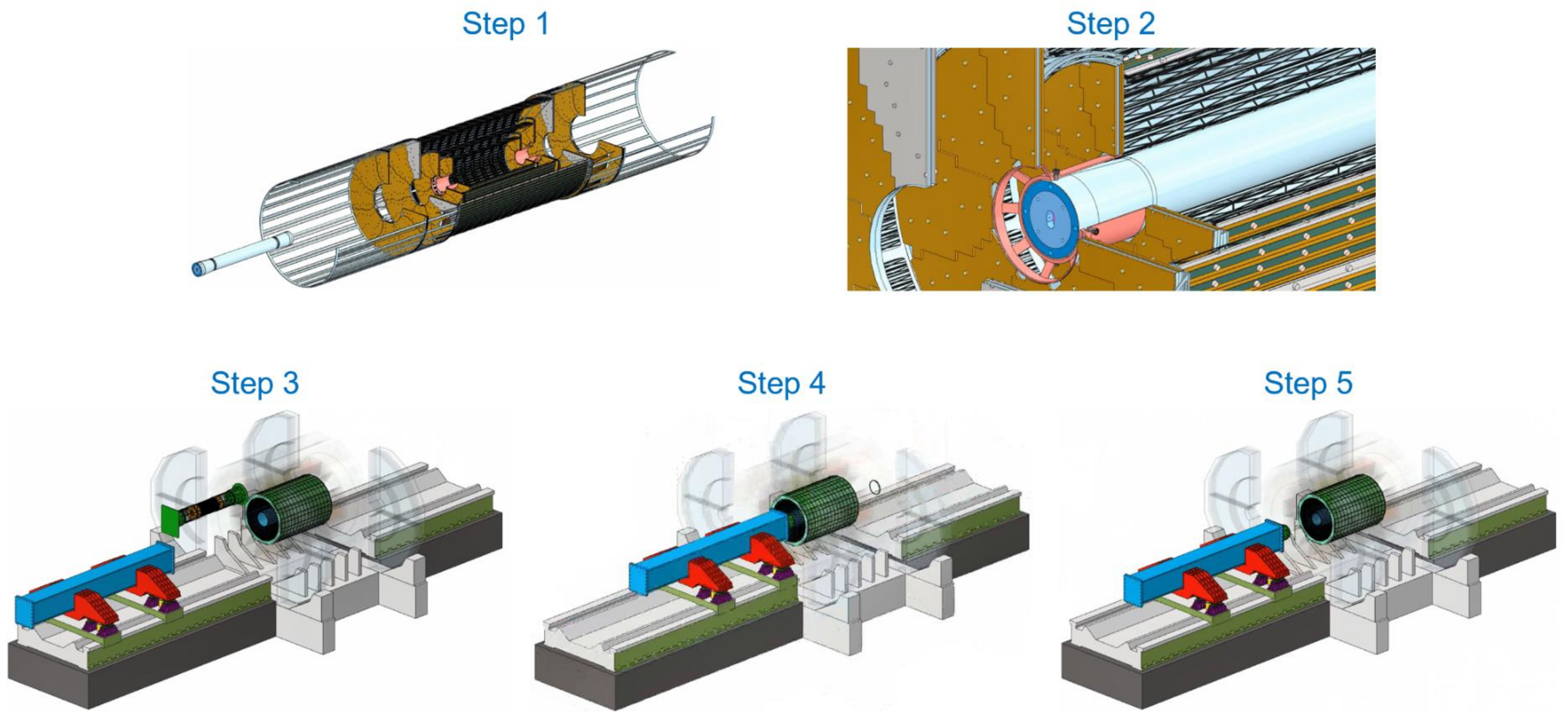


Figure 14.40: Installation process for the ITK. ITK will be assembled with the central beam pipe assembly in the ground hall and then transported to the underground for the final installation.

- How are the cables and pipes handled in this stage of the installation?
  - Provide a detailed picture of the tool that attaches to the ITK with explanation on how cables are handled. The tool seems to be a solid plate on the ITK attachment side, which would not allow for cables to come out.

Chapter 14

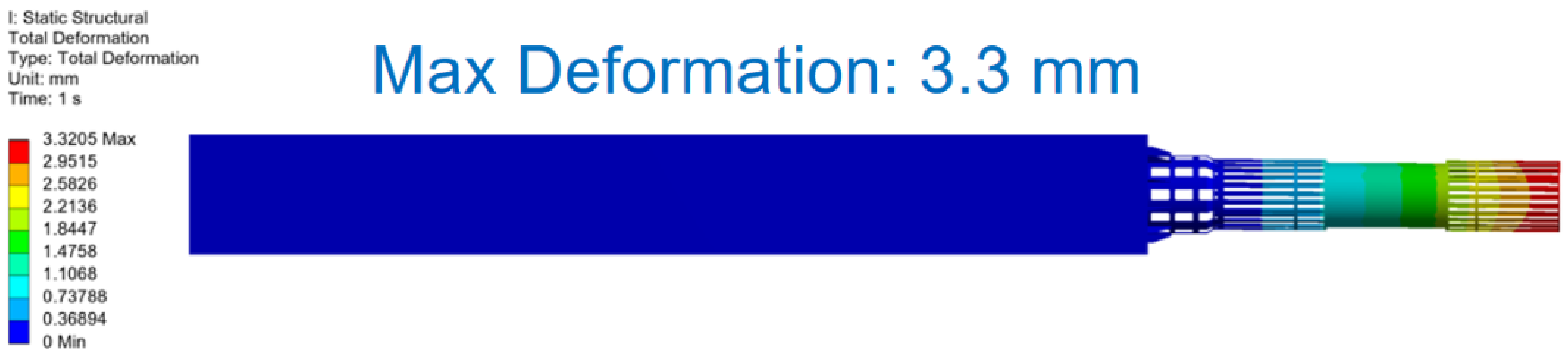


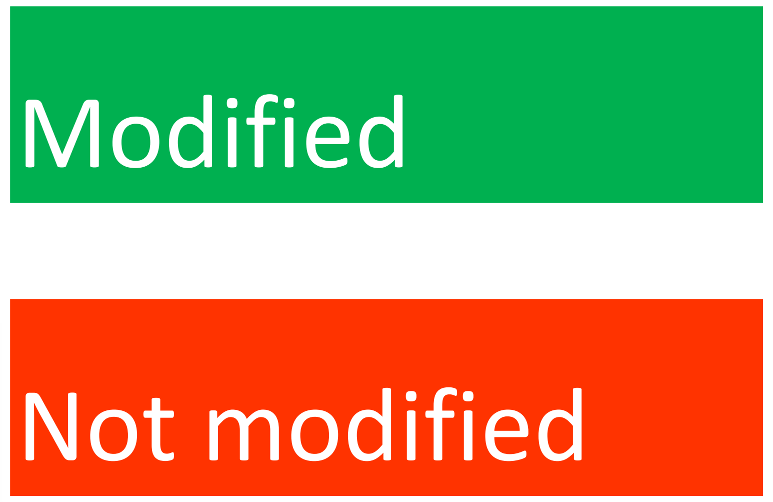
Figure 14.41: The simulation result of ITK cantilever installation.

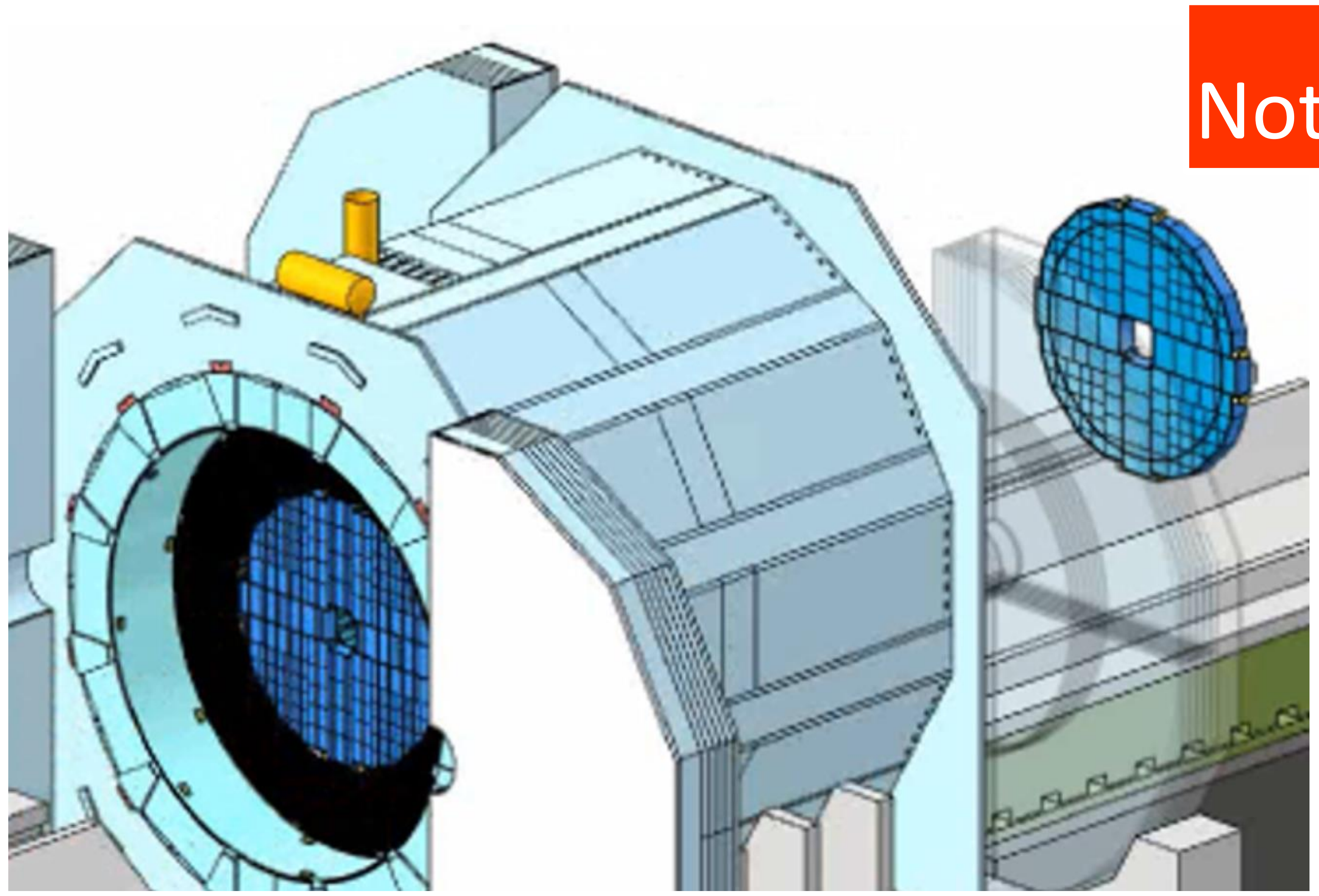
Modified

Not modified

- Same problem as other plots of this type
  - The legend font is too small and the number of significant figures is too large.
- Fig. 14.41: How is the attachment to the ITK treated in the FEA? It seems strange that there is no deformation difference at the boundary of the tool and the ITK
  - What is the stress at the attachment points?

Chapter 14





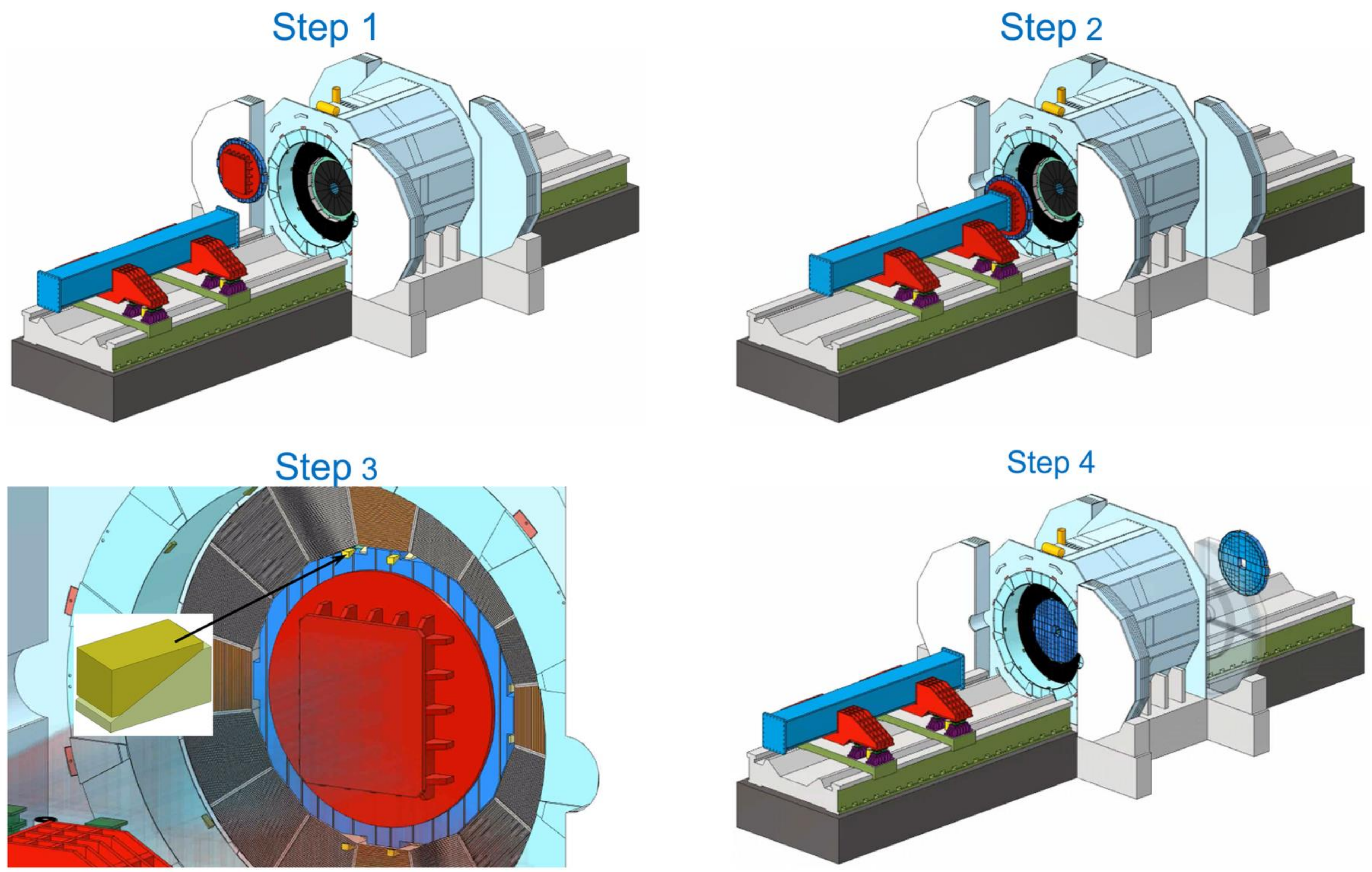


Figure 14.42: Installation process for the endcap ECAL installation. When one side installation finished, the core shaft will be moved to the other side to install the endcap ECAL on the other end.

- It would be important to explain how the red support structure attaches to the carbon fiber frame of the ECAL, also show FEA for carbon fiber frame of stress at the fixation points. (The FEA in Fig 14.43, seems to have a uniform attachment to the ECAL since the deformation is exactly the same at the junction point.)
- Contrary to Fig 14.23, that shows OTK attached to the ECAL, this figure step 4 shows bare ECAL without OTK
- Also, there should be a carbon frame, which seems to be shown in Step 3, but not in Step 4.

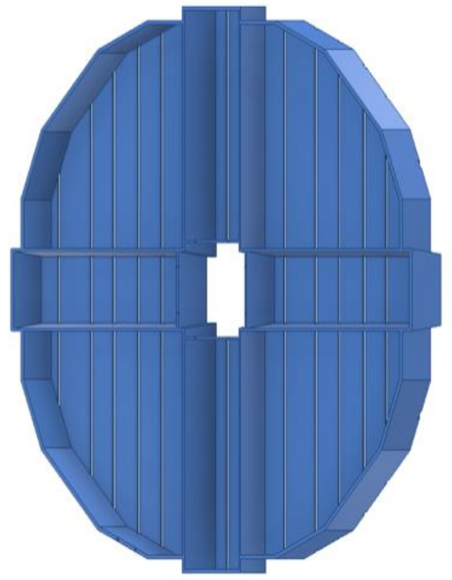


Fig 7.15 from ECAL

Chapter 14

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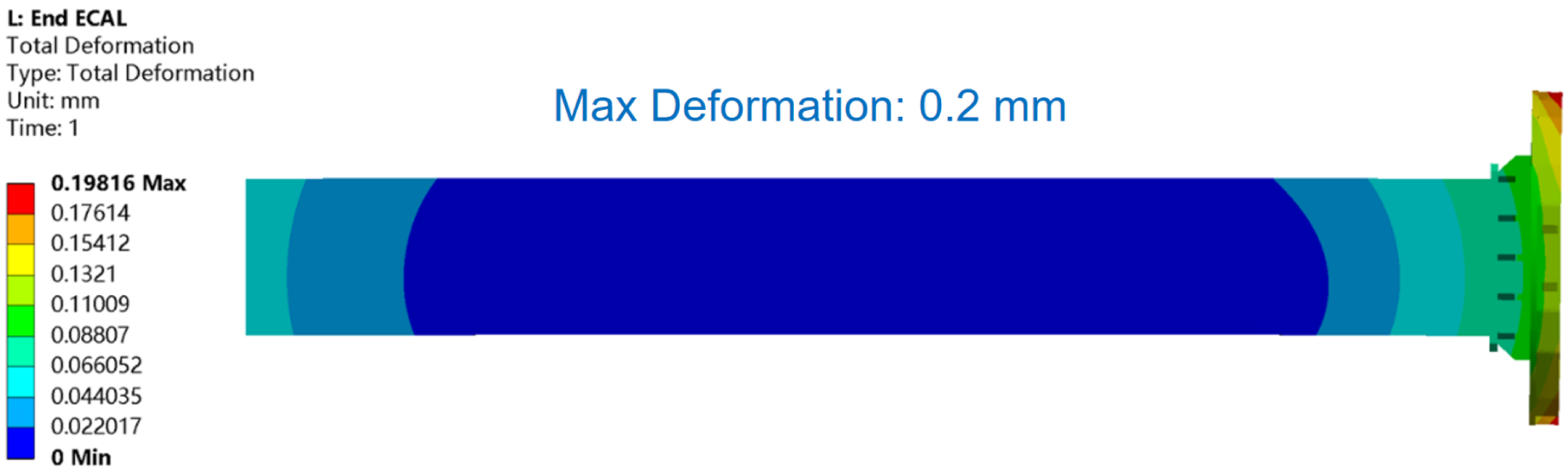

Figure 14.43: The simulation result of endcap ECAL cantilever installation.

- It would be important to explain how the support structure attaches to the carbon fiber structure of the ECAL
  - The FEA in Fig 14.43, seems to have a uniform attachment to the ECAL since the deformation is exactly the same at the junction point.
  - Do you have the stress values at the attachment?

Chapter 14

- Step 3: Open the endcap yoke for interface installation of the accelerator vacuum components.

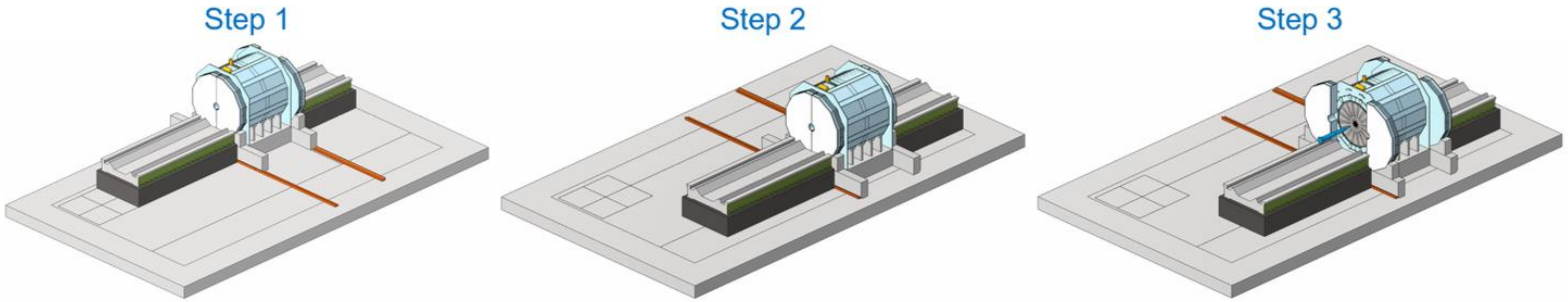

Figure 14.46: Entire moving and alignment of the detector. Closing the endcap yoke-pushing detector to the collision point-moving the rails to the collision point-positioning and aligning-open the endcap yoke for continue installation.

Modified

Not modified

- This figure is very simple. Also a good candidate to be removed. The main point is that we need to open the endcap yoke to install the accelerator beam pipe, but no details are giving about this critical step.
  - Can we provide some details, or reference where this is explained? Accelerator TDR? I don't think so