

# Possible mechanical design for the TOF detector

SLAC SuperB workshop, October 7<sup>th</sup> 2009

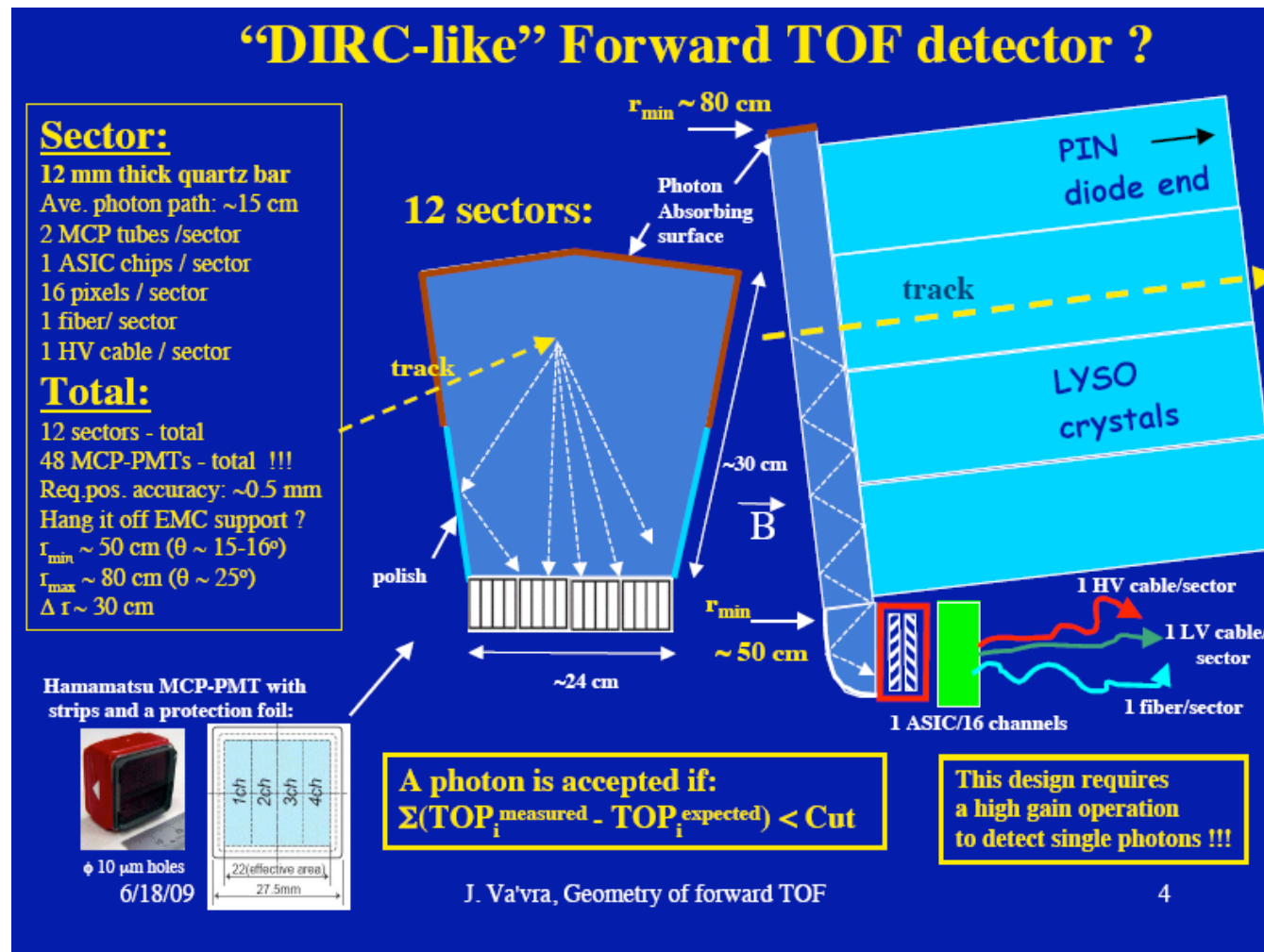
Nicolas Arnaud, Frédéric Bogard, Achille Stocchi, Sandry Wallon  
(LAL-Orsay)



- Starting point: Jerry's TOF design #1 @ Perugia workshop
- Goals & Limits of the project
- Drawings by LAL Orsay engineers Sandry Wallon & Frédéric Bogard
- Aim at starting discussion with people from the involved systems: PID, DCH and EMC

# Jerry's Design @ Perugia workshop

- From <http://agenda.infn.it/getFile.py/access?contribId=132&sessionId=43&resId=0&materialId=slides&confId=1161>

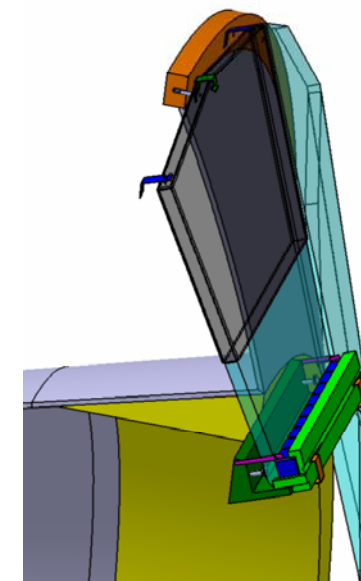
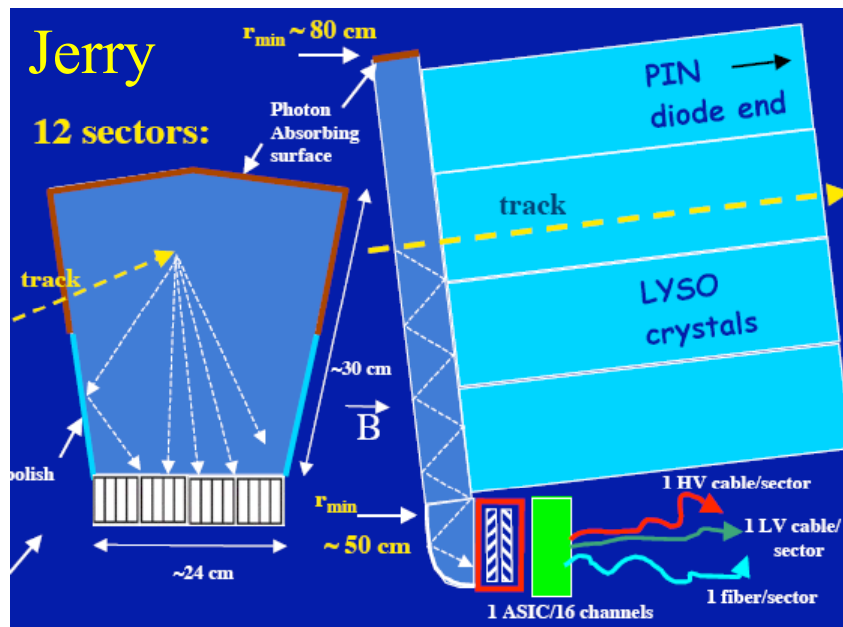


# Goals & limits of the project

- Work done by two LAL engineers: S. Wallon & F. Bogard
  - No prior experience with the forward side of BaBar
  - Based on papers (mainly BaBar NIM), talks and misc. materials (e.g. pictures) whose information doesn't always match (dimensions, angles, etc.)
  - Some interpolation needed when actual data missing
- Clearly not aimed at being a final design
  - rather a proof of principle which can very likely be improved:  
all feedbacks welcome!
  - a concrete proposal with which to start discussing with neighboring systems:  
DCH ('upstream') and EMC ('downstream')
- Drawings done with the **Catia**<sup>®</sup> software (standard at IN2P3)
  - Common exchange format with the other SuperB groups?

# LAL Design for a TOF detector

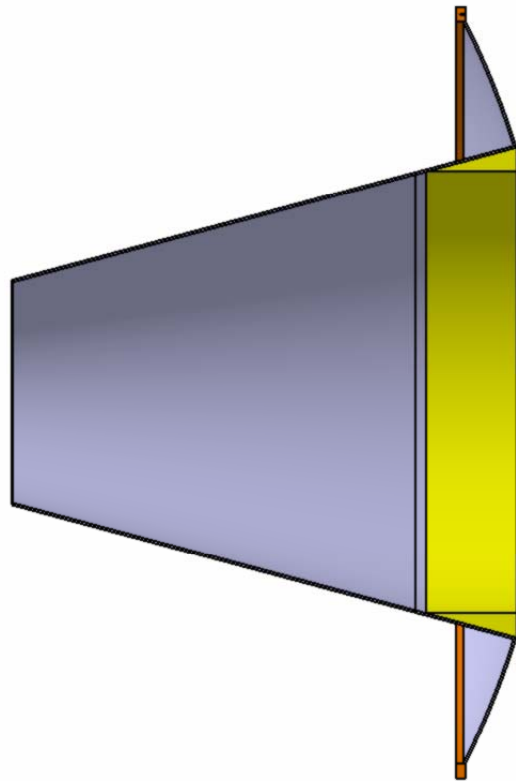
- Engineer main idea: to **hold the forward PID on the DCH endplate**  
→ Structure mechanically simpler than the crystals envelope
- Use a convex DCH endplate
- Initial drawings show at July PID meeting  
<http://agenda.infn.it/getFile.py/access?contribId=3&resId=0&materialId=slides&confId=1683>  
→ Current drawings have been updated based on feedbacks received



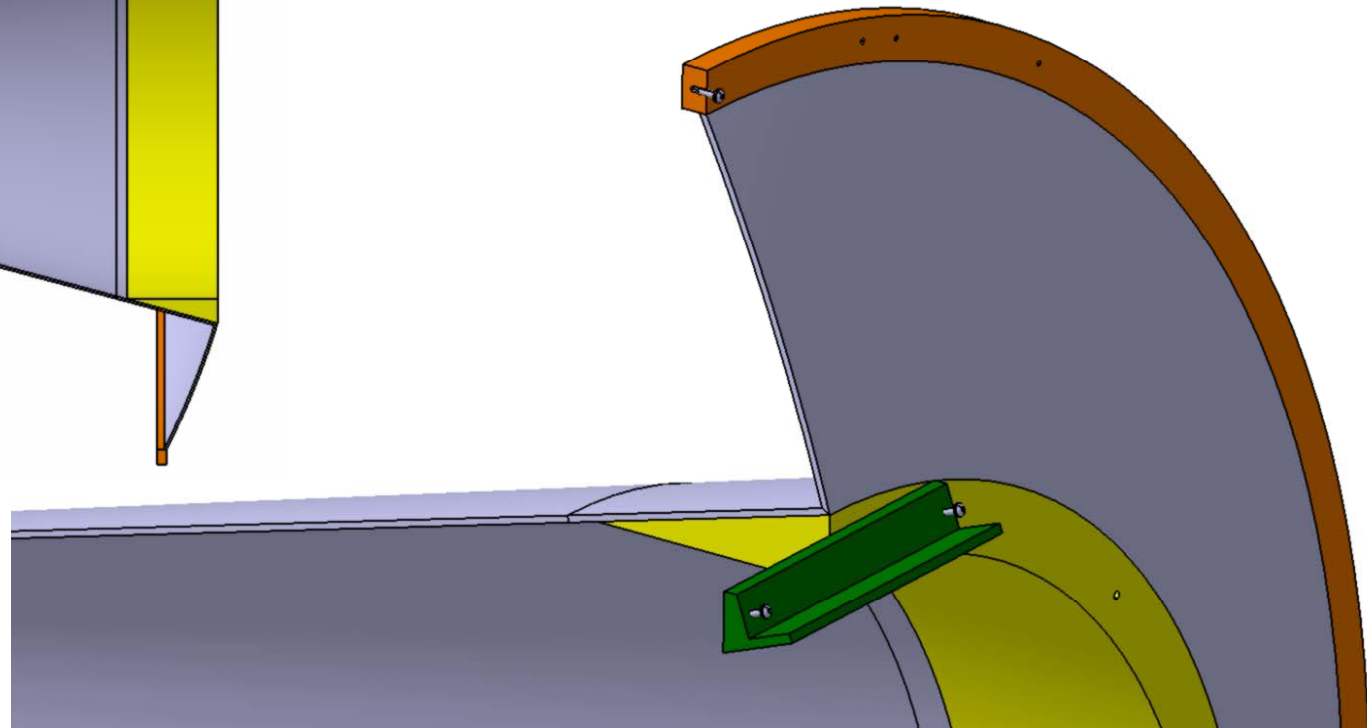
LAL  
Design  
(details  
follow)

# Drawings (1/6)

- Starting from a convex DCH endplate [EMC endcap not represented]

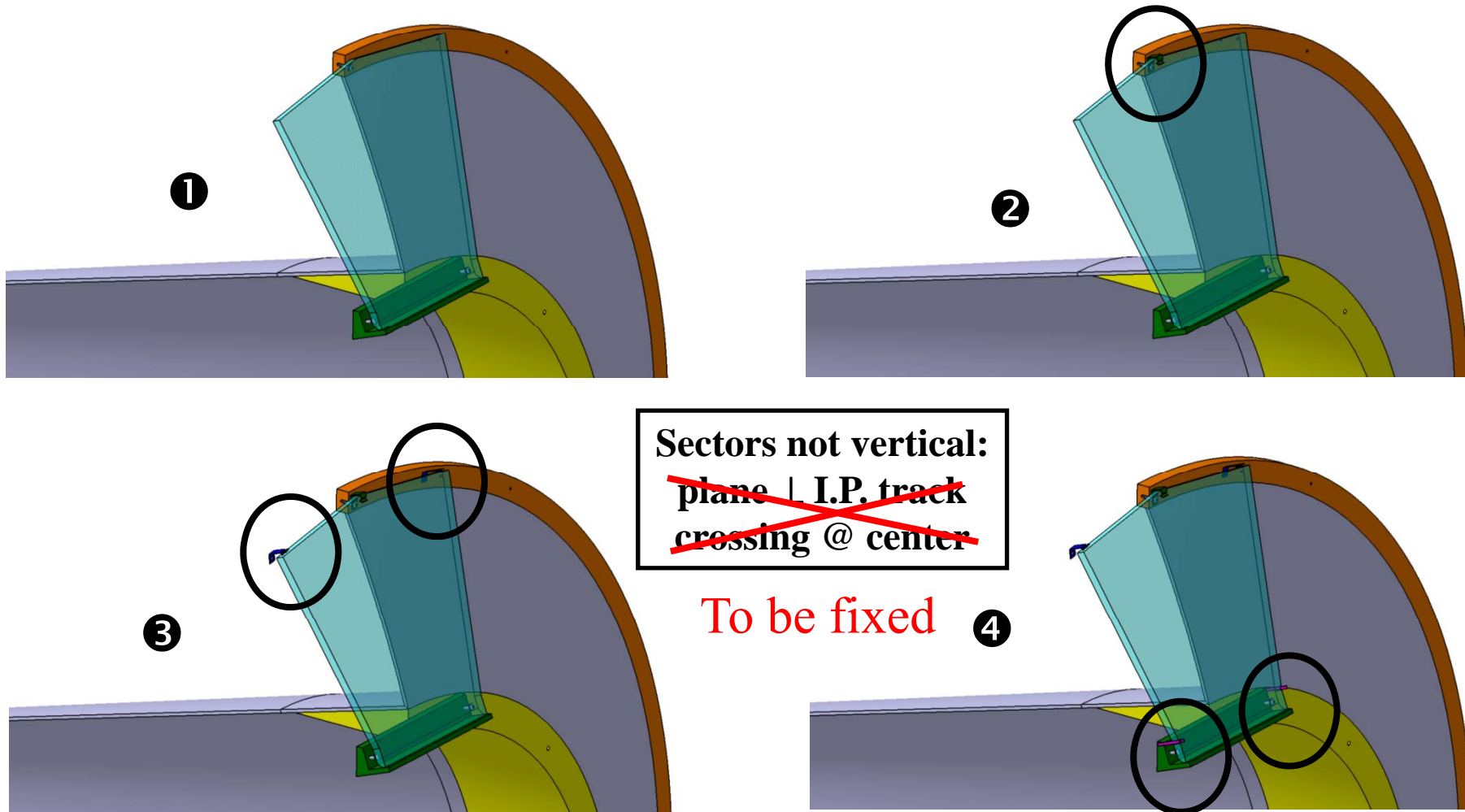


- Adding flanges (yellow and orange)  
+ a support (green) for each sector



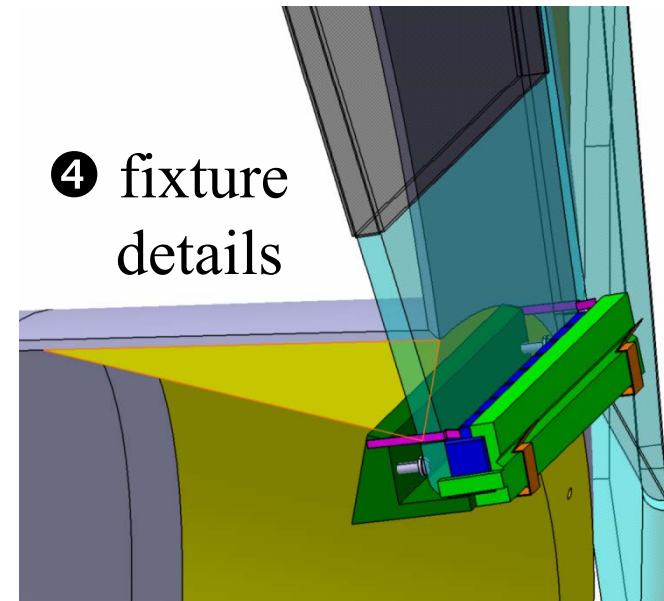
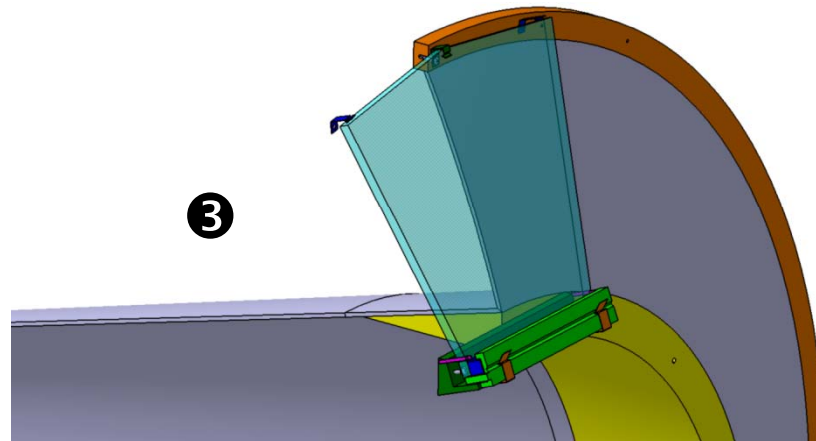
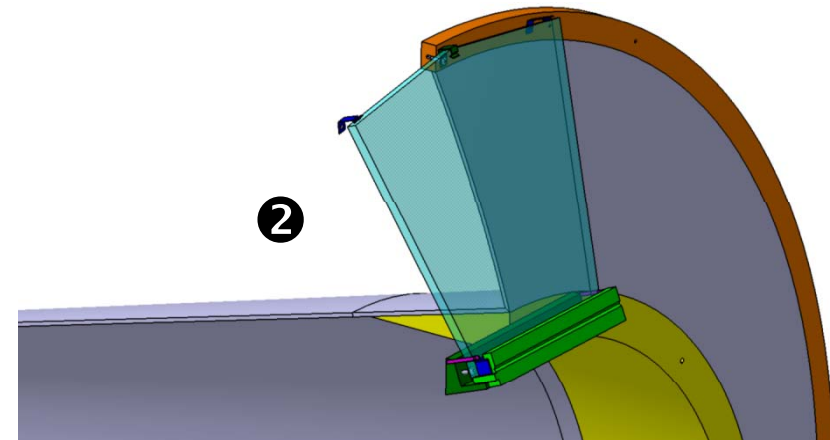
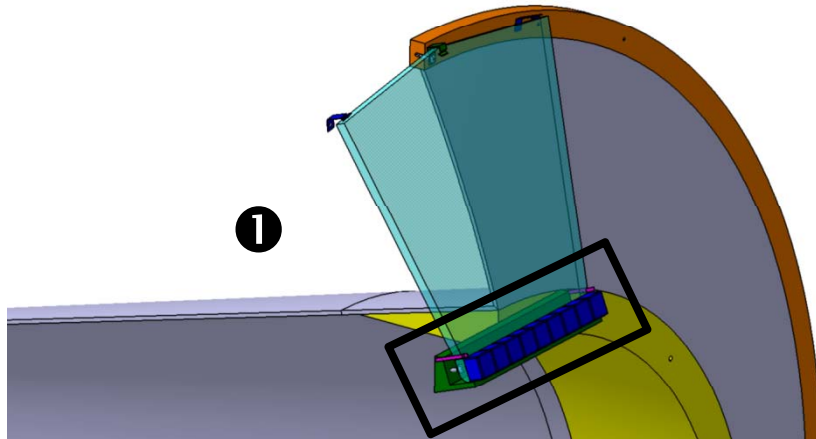
# Drawings (2/6)

- Quartz sector installed; examples of support which could allow a few mm adjustment



# Drawings (3/6)

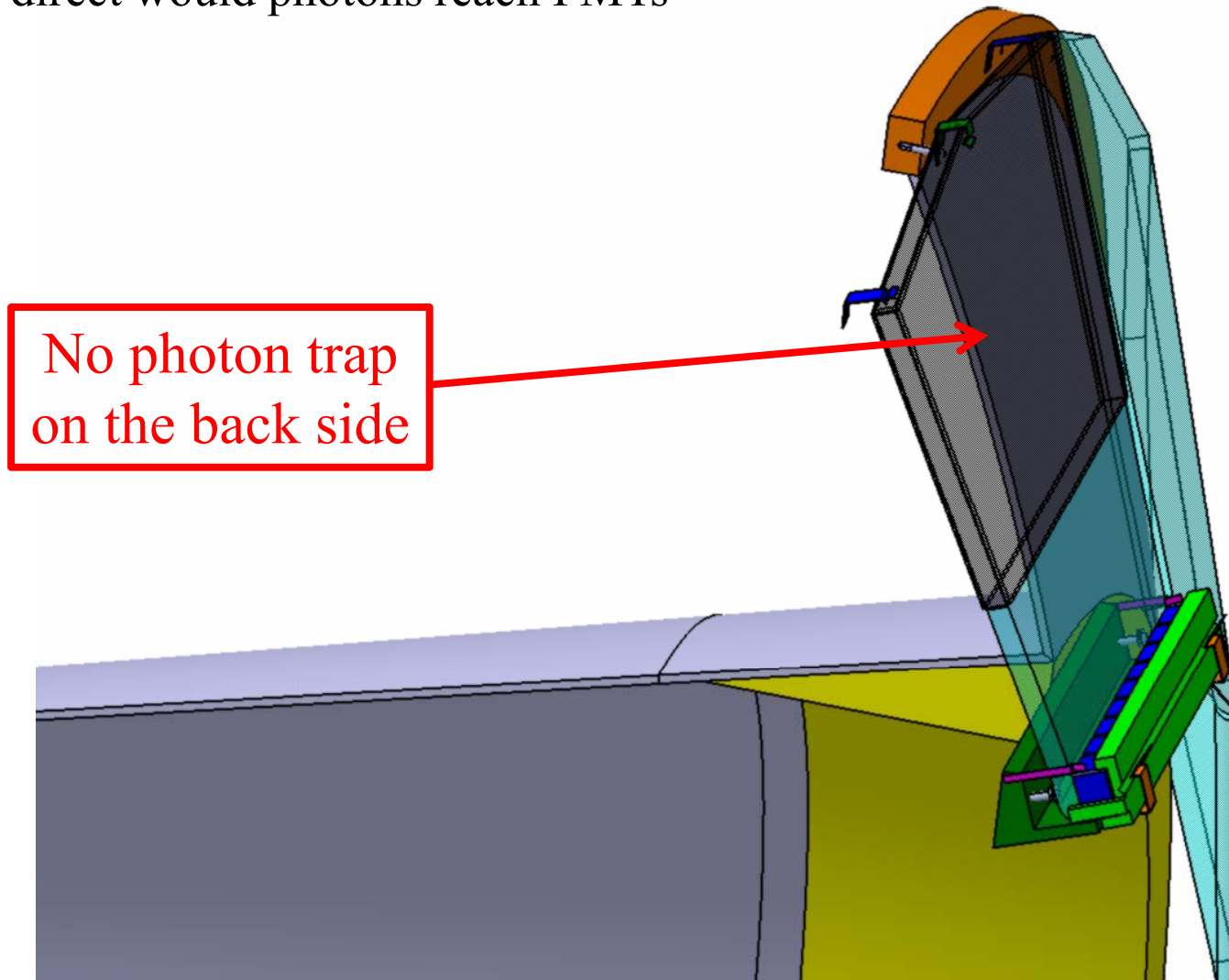
- Adding PMTs (blue) and their shielding; foreseen to be reachable for repair/change





# Drawings (4/6)

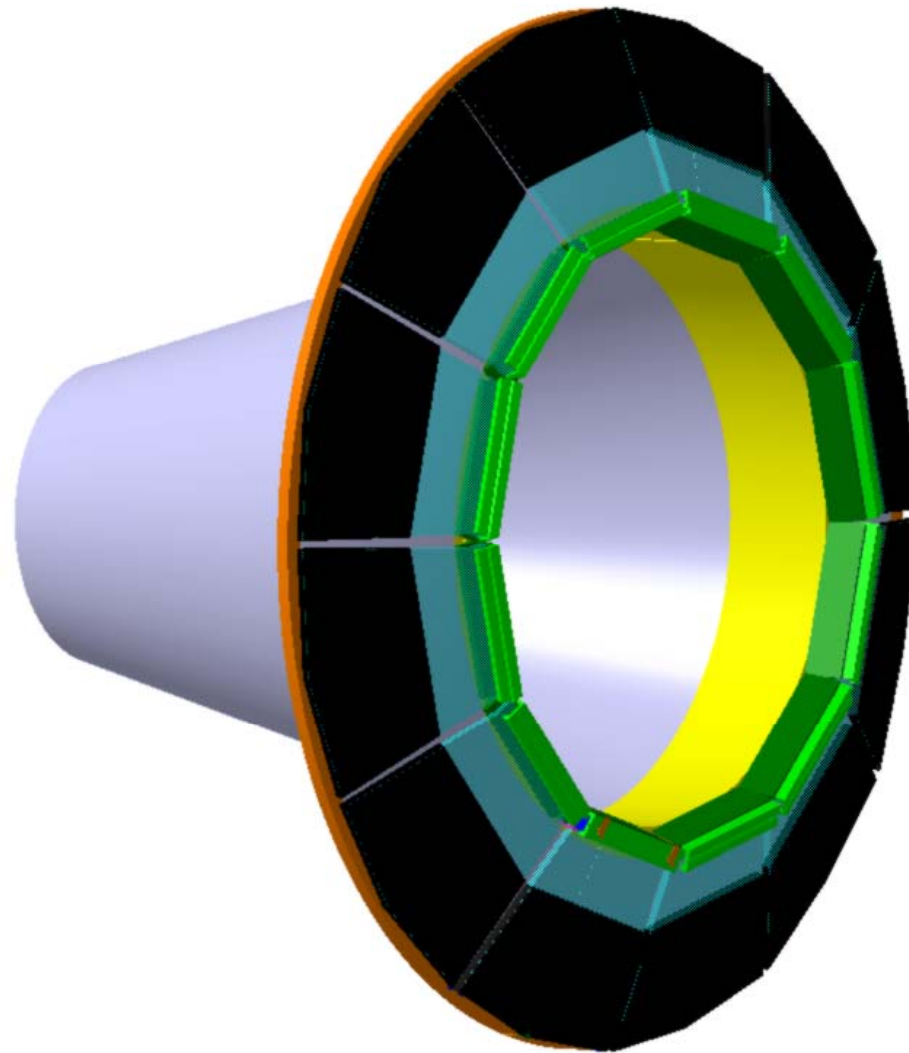
- Full sector with possible photon trap (tbc) on the uppermost part  
→ only direct would photons reach PMTs





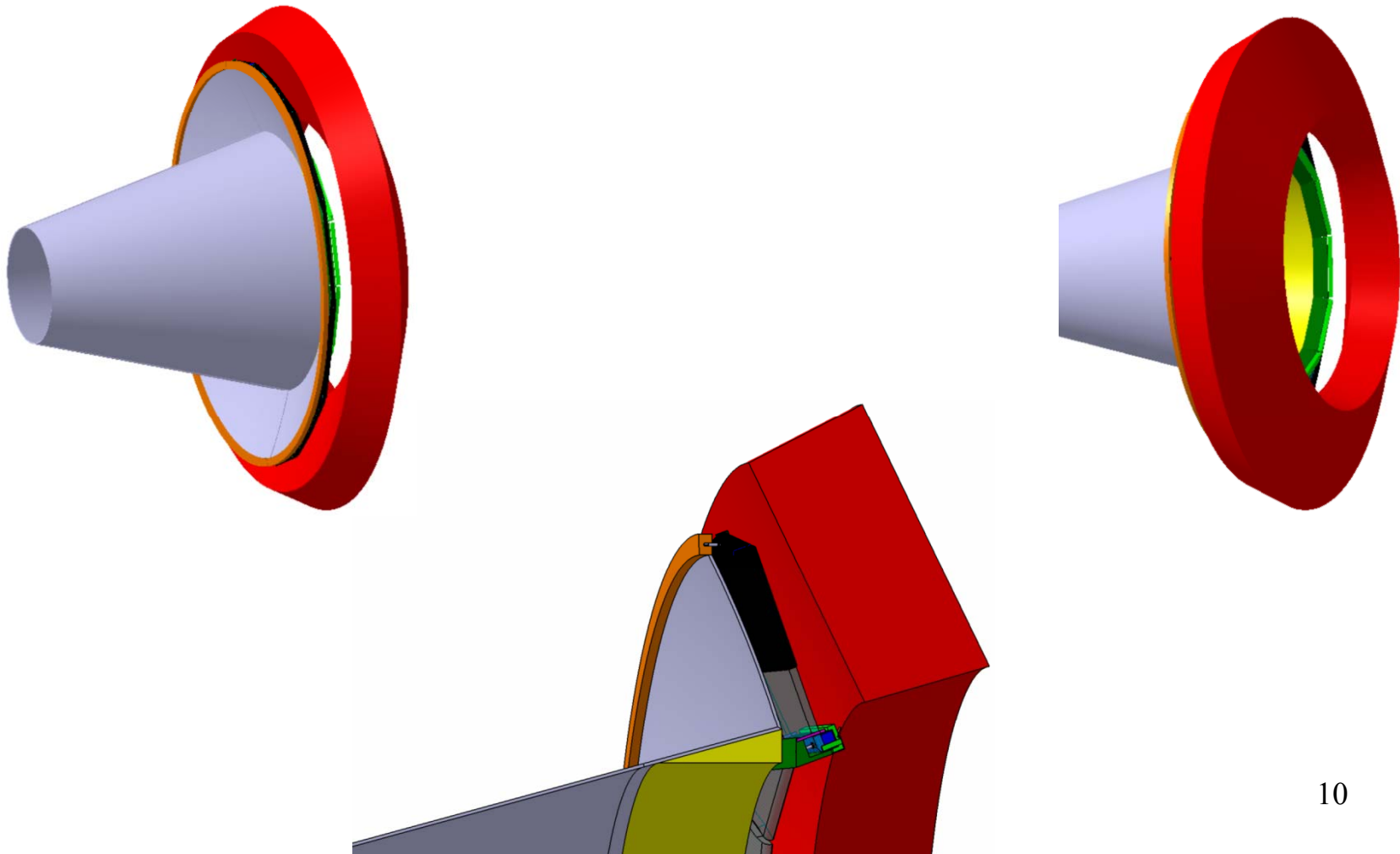
# Drawings (5/6)

- Rear view of the full subdetector; DCH cone, no EMC endcap



# Drawings (6/6)

- Overall, a very thin detector [EMC endcap in red]



# Outlook

- Orsay proposal for Jerry's Perugia design
- Nothing frozen:
  - proof of principle
  - real dimensions & angles unknown for all systems
  - utilities (cooling pipes, supports, etc.) missing as well
- Already got comments from PID group this morning:
  - Angle of the device should be increased ( $\Rightarrow$  will take more space in z)
  - Photon trap only for the sides of the quartz surface, not in the back
- Comments from other systems and management more than welcome

