



# **Toward a TPC for CEPC TDR**

## **- Beam test at DESY**

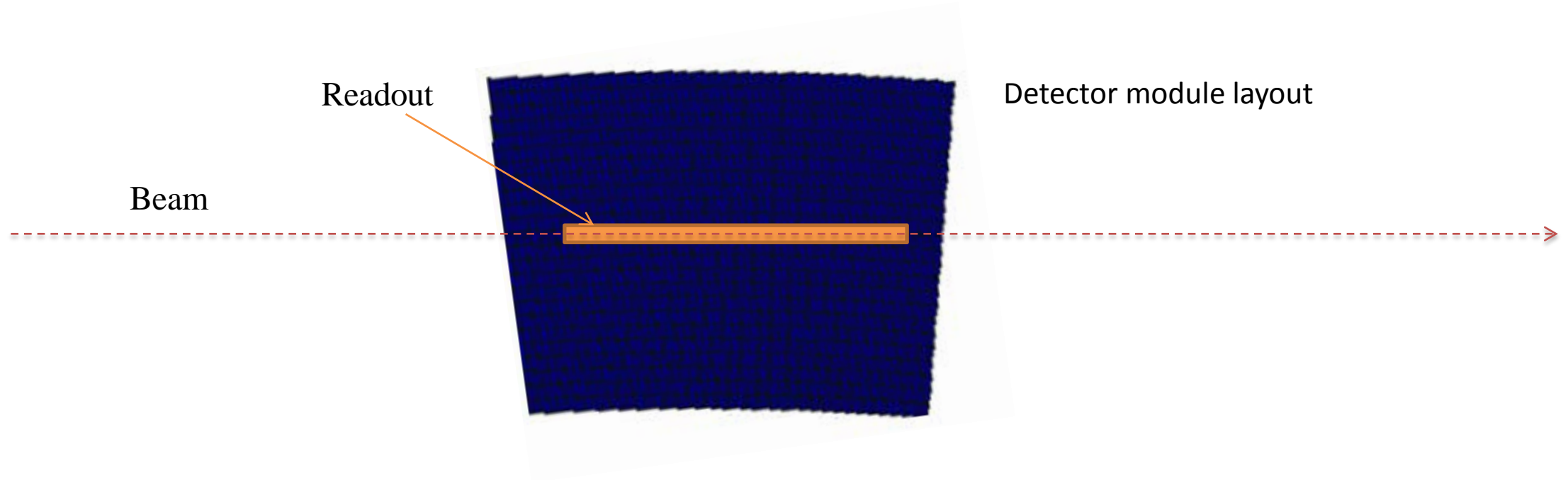
**Huirong Qi**

**Weekly meeting of CEPC TPC Group, June 5, 2024**

# Some critical simulation and validation

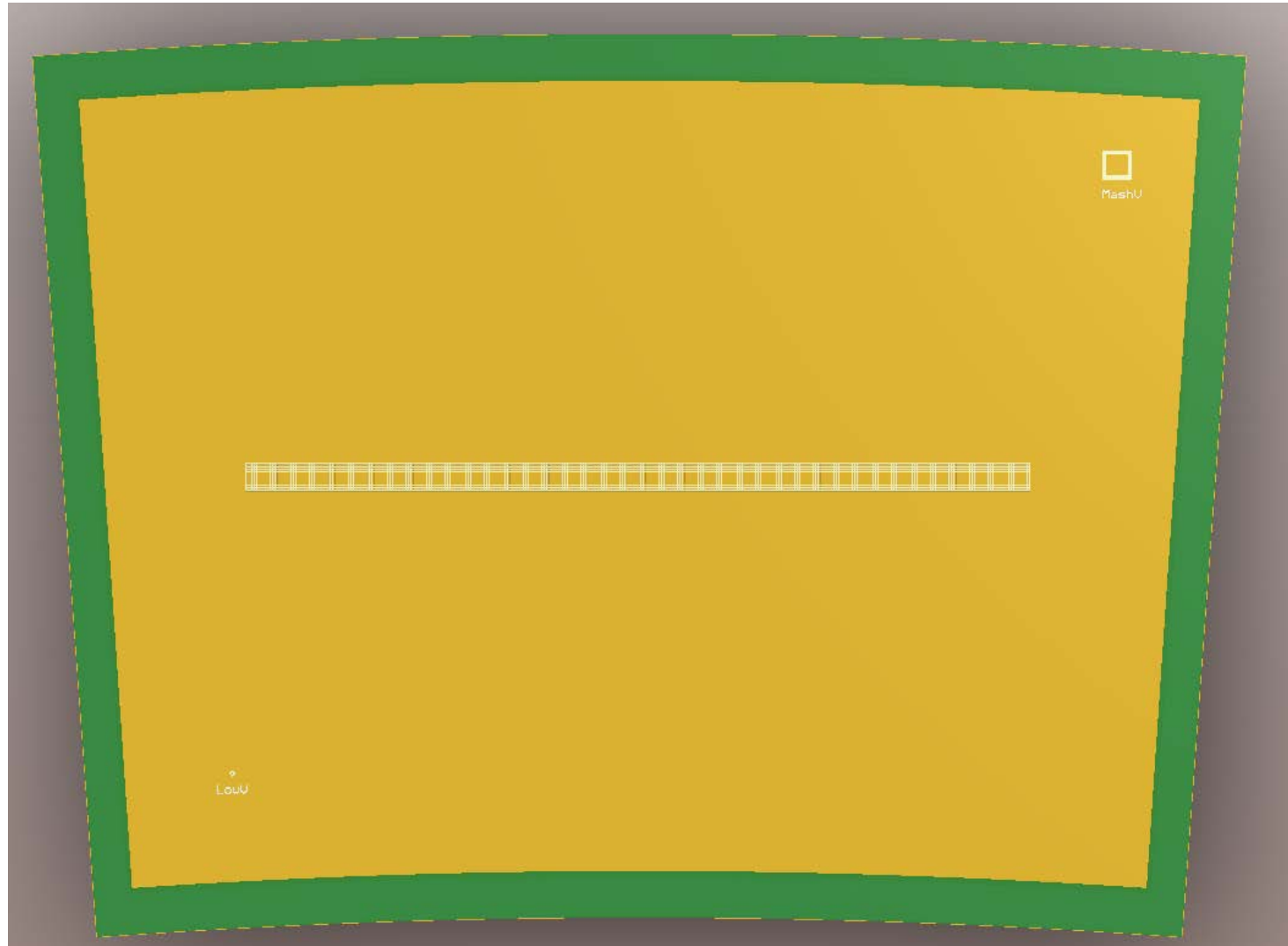
- Pixelated readout TPC can be as a **realistic and promised** track detector in CEPC TDR, some key issues will be simulated and validated.
  - Material budget at endcap/barrel
  - Occupancy and hit density
  - **Improved  $dE/dx+dN/dx$**
  - Ion backflow suppression
  - **Reasonable channels and power consumption**
  - Running at 2 Tesla
  - Beamstrahlung and distortion
  - **Cost estimation**
- LCTPC (Lepton Collider Time Projection Chamber) collaboration will continue to push this technology to e+e- collider.

# Module of the beam test



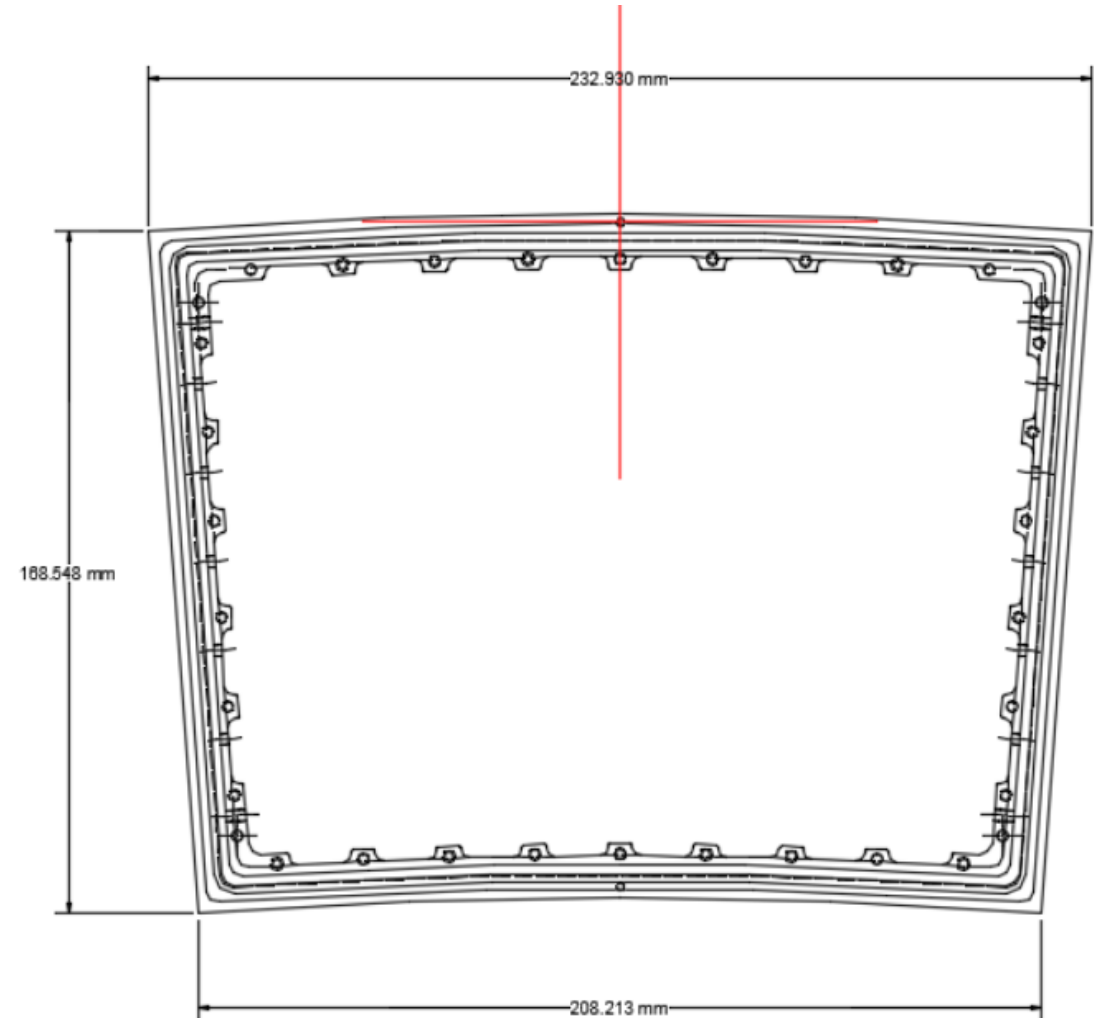
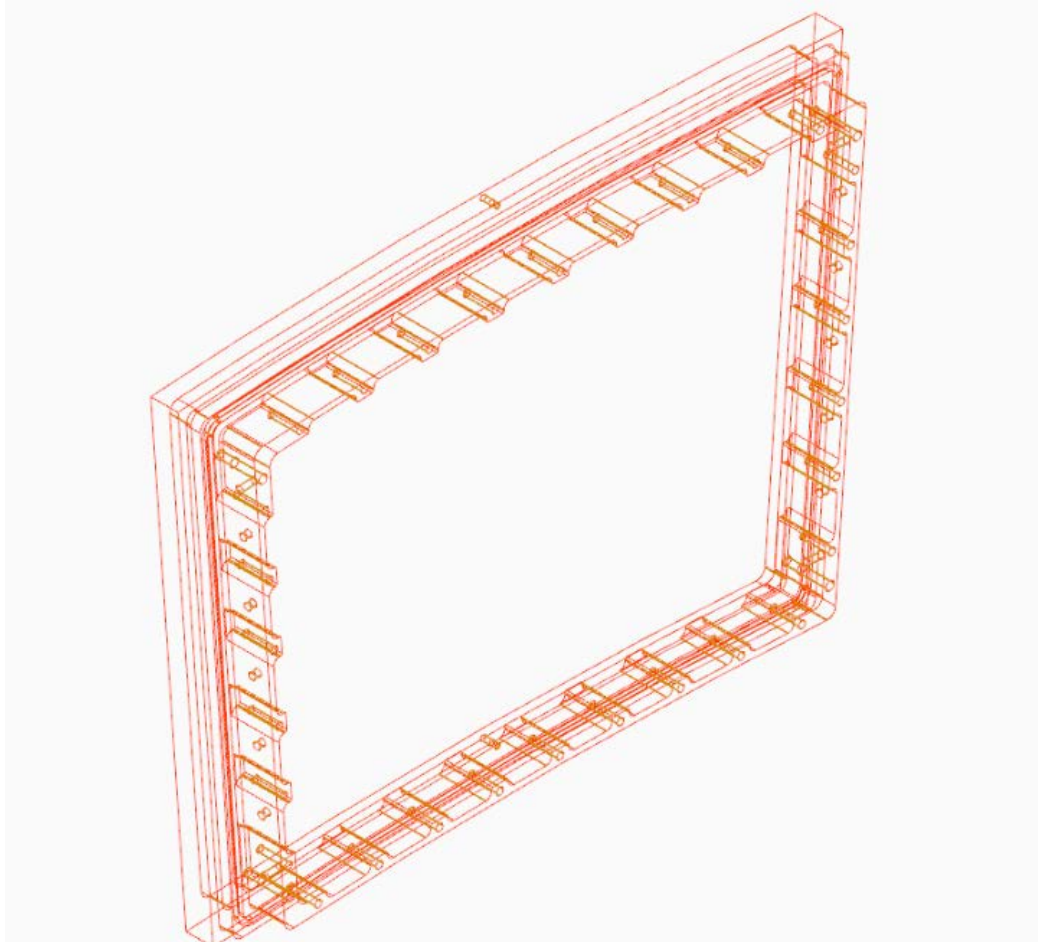
# Progress on the PCB design

- Chang Yue completed the designing the readout board.
  - The document has been sent on 03 June.



# Module of the beam test

- Four Aluminum backframes have been processed.
  - Two backframes will be done in next week and delivered to Tsinghua.



- Chang Yue has started designing the readout board.

材料：6061-T651，无磁高强度铝合金材料

技术要求：

1. 高强度密封支撑件设计按照需求老师的需求，外形尺寸 220mm × 175mm，加工所有表面和孔，留出 0.8mm 额外材料进行热处理。
2. 200±5℃,保温 6 小时以上，取出空冷完成热时效处理
3. 精加工到位，加工精度 0.05mm。
4. 表面导电阳极氧。
5. 销钉孔位采用负公差加工，加工精度小于 0.050mm。
6. 密封 O 圈采用硅氟橡胶材质，完成预安装调试。

## Second goal in the end of this year

- One detector module
- One e beam track
  - Validation of the detector module
  - Preliminary of the  $dE/dx$  and  $dN/dx$  analysis
- **Discussion**
  - Detector
    - Huirong Qi, Yue Chang, Xin She
  - Mechanics
    - Jian Zhang, Yue Chang, Xin She
  - Electronics
    - Zhi Deng, Canwen Liu
  - DAQ
    - Zhi Deng, ...

**Many thanks!**