



# **Toward a TPC for CEPC TDR**

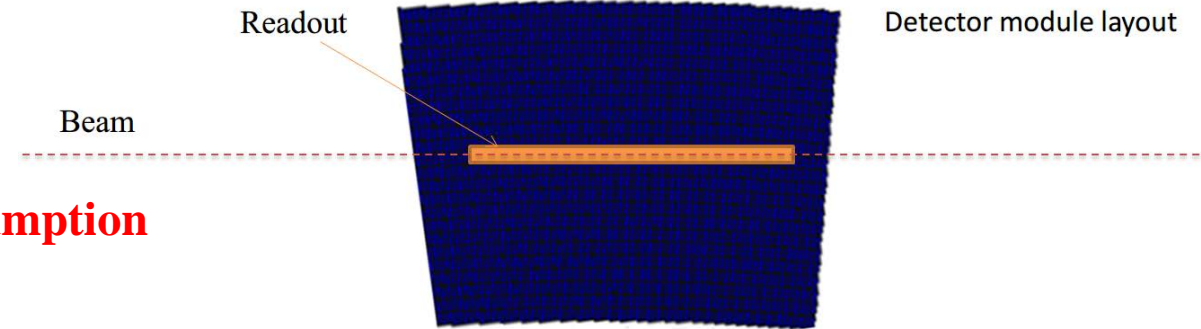
## **- Beam test at DESY**

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**Weekly meeting of CEPC TPC Group, July 03, 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.



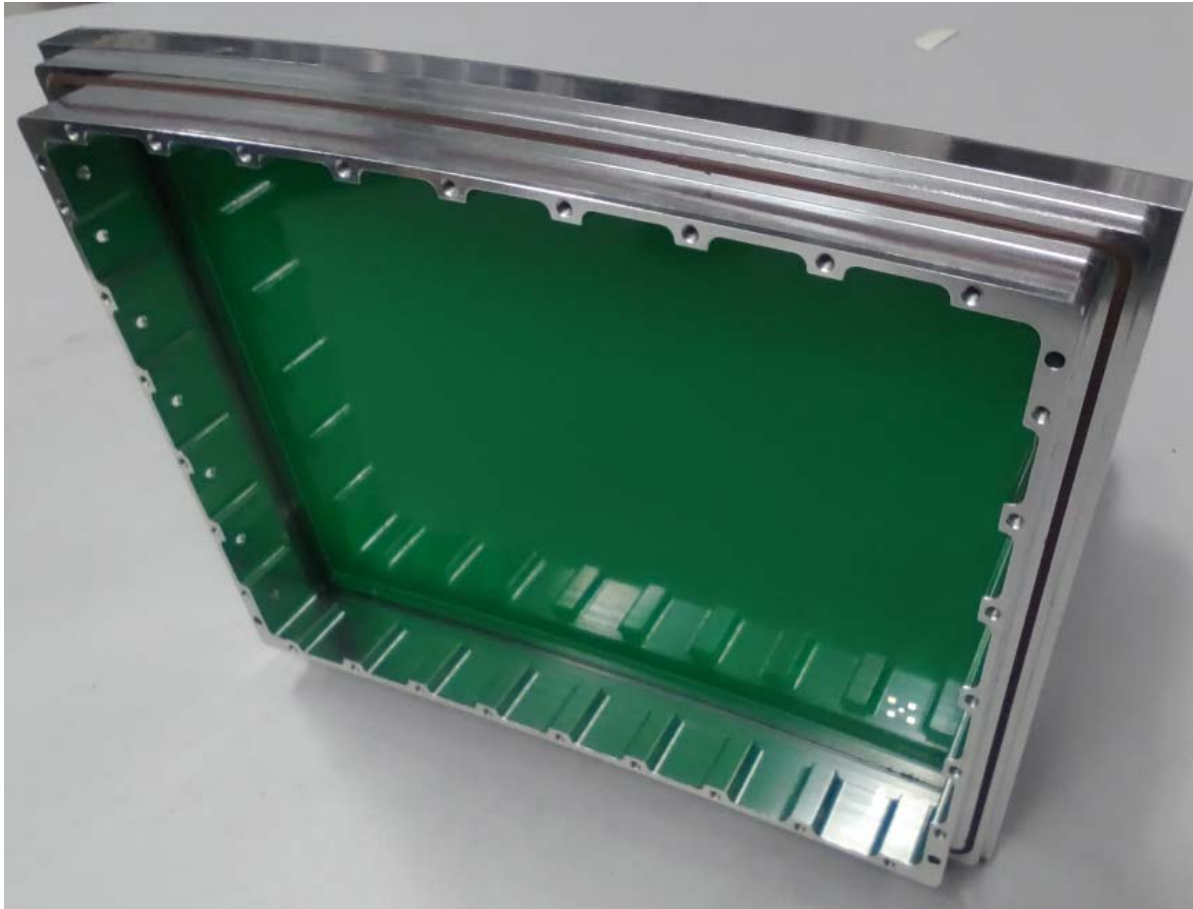
# Optimization of the readout PCB

- PCB material : TG230 (耐温230摄氏度)
- Some minor optimization of the readout PCB
  - HV connection spot reduced to  $\frac{1}{4}$
  - Boundary of TOP layer 8mm to 5mm
  - Added the HV melt point in Bottom
- Yue Chang contacted Feng He
  - All optimization inputted in new PCB




## Assembled module of the beam test

- Two Aluminum backframes have been done.
  - One assembled module delivered to Tsinghua.
  - **O ring has been selected using 2.3mm**



# Some Confirmation from DESY

- NIM-TTL (NIM ORTEC module) : 2 in Lab room
- FAN IN/OUT (NIM ORTEC module)
  - ORTEC AN308/NL DUAL 8-INPUT MIXER



**EG&G/ORTEC AN308/NL DUAL 8-INPUT MIXER.**

**CHARACTERISTICS**  
The AN308/NL is a direct-coupled dual 8-input linear mixer capable of high-speed signal processing. The unit is packaged in a single-width NIM module (per TID-2 supply). Each of the two identical sections of the unit can accept the signals from simultaneous signals does not exceed 2V of either polarity on 50 Ohm. With a nominal bridging 2-connector output to be terminated in 50 Ohm. For larger systems the two input linear mixer. The wide dynamic range of the unit allows its outputs to be used AN308/NL provide good 50 Ohm termination with low reflections from fast transients accommodate large overloads without damage. The output is noninverting, and for fast signals with minimum overshoot and distortion. The unit is completely dc-coupled and its input sections to be cascaded.

**SPECIFICATIONS**

INPUTS		LEMO Connectors accept input signals
Inputs 1 - 8		50 Ohm dc-coupled
Impedance		Positive or negative
Polarity		<5% for +/-2V, 1 nSec rise-time input
Reflections		+2V to -2V
Linear Range		+/-5V dc, +/-50V transient
Protection		<+/-5 mV with all inputs terminated in 50 Ohm
Offset		Temperature Coefficient <100 uV/'C

- 1. Preparation of pixelated readout FEE, Status and plan ?
- 2. Readout PCB, Status and plan ?
- 3. Data structure, Status and plan ?
- Others discussion.

**Many thanks!**