



Gaseous detector chapter towards CEPC TDR

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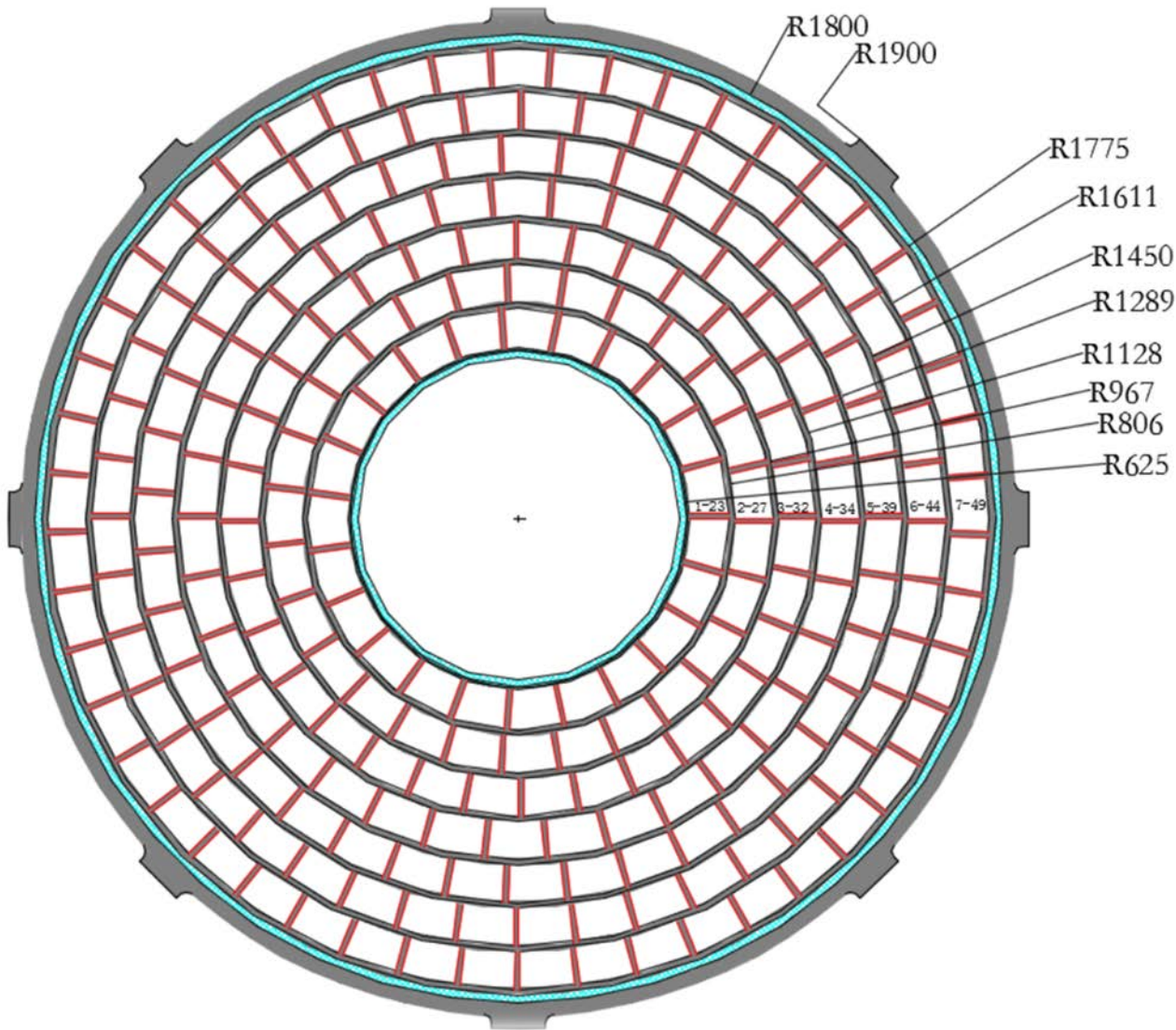
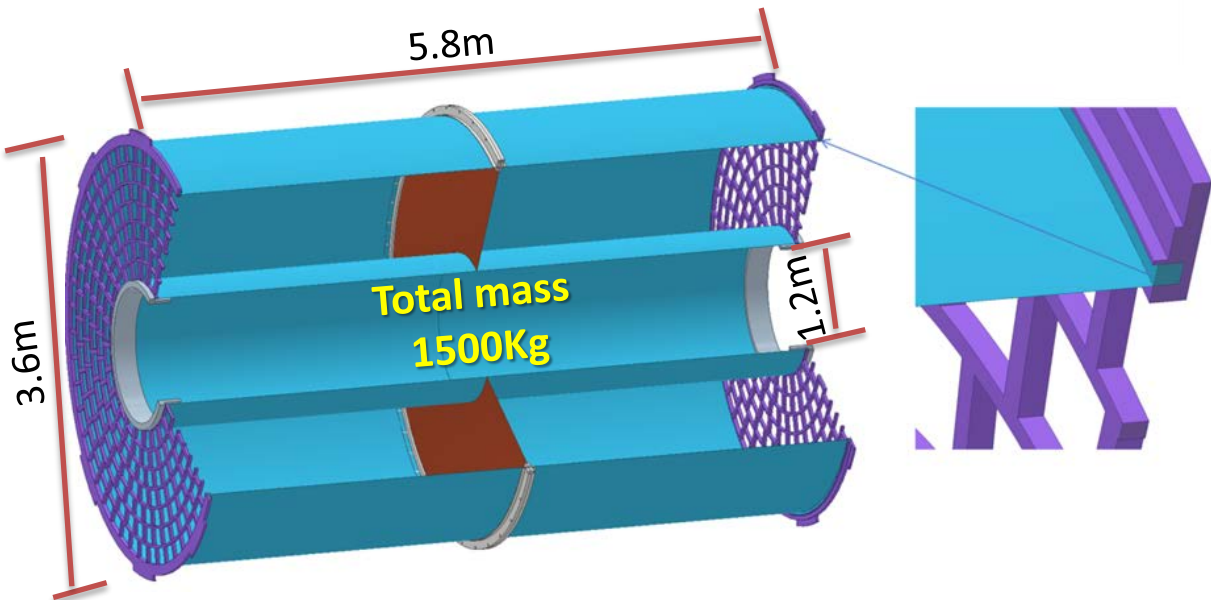
- **Updated design of TPC for TDR**
- **Abstracts submitting to CEPC2024**

Chapter 5 Gaseous trackers

- 5.1 Physics requirements and detection technology
 - 5.1.1 Physics requirements of Higgs and Tera-Z
 - 5.1.2 Technology choice and the baseline track detector . . .
- 5.2 Pixelated readout TPC detection
 - 5.2.1 TPC detector and readout electronics
 - 5.2.2 Mechanical and cooling design
 - 5.2.3 Challenges and critical R&D
 - 5.2.4 Detector modules toward the validation prototype . . .
- 5.3 Performance of TPC tracker
 - 5.3.1 Overall of the simulation framework
 - 5.3.2 Spatial resolution and PID performance
 - 5.3.3 Improvement using the machine learning algorithm . .
- 5.4 Alternative track detector of Drift Chamber in Tera-Z
 - 5.4.1 PID for high luminosity Z pole at 2T
 - 5.4.2 Performance and critical R&D
- 5.5 Cost estimation

Updated design of TPC mechanics for TDR

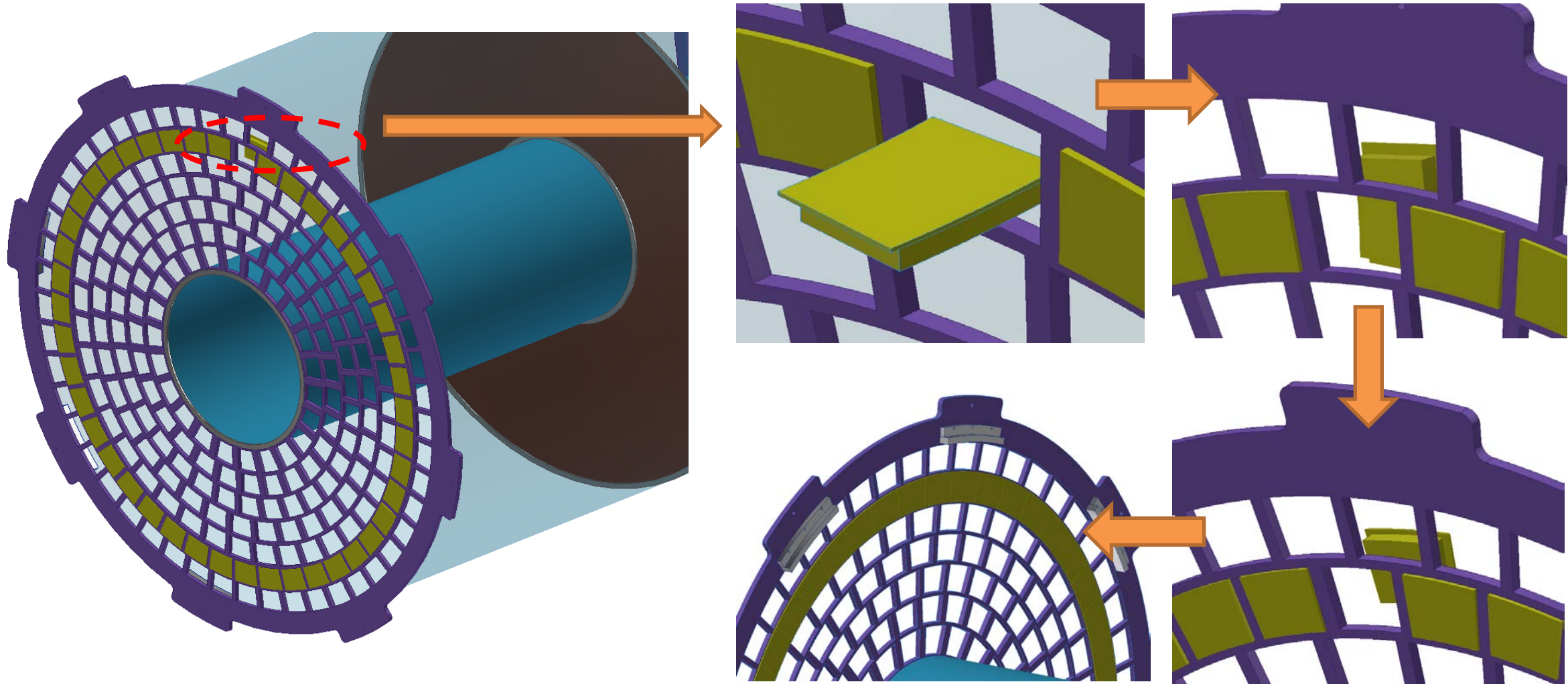
TPC detector	Key Parameters
Modules per endcap	248 modules /endcap
Module size	206mm×224mm×161mm
Geometry of layout	Inner: 1.2m Outer: 3.6m Length: 5.9m
Voltage of Cathode	- 62,000 V
Operation gases	T2K: Ar/CF4/iC4H10=95/3/2
Total drift time	34μs @ 2.75m
Pixelated detector	Pixelated Micromegas



Detailed design of TPC detector in ref-TDR

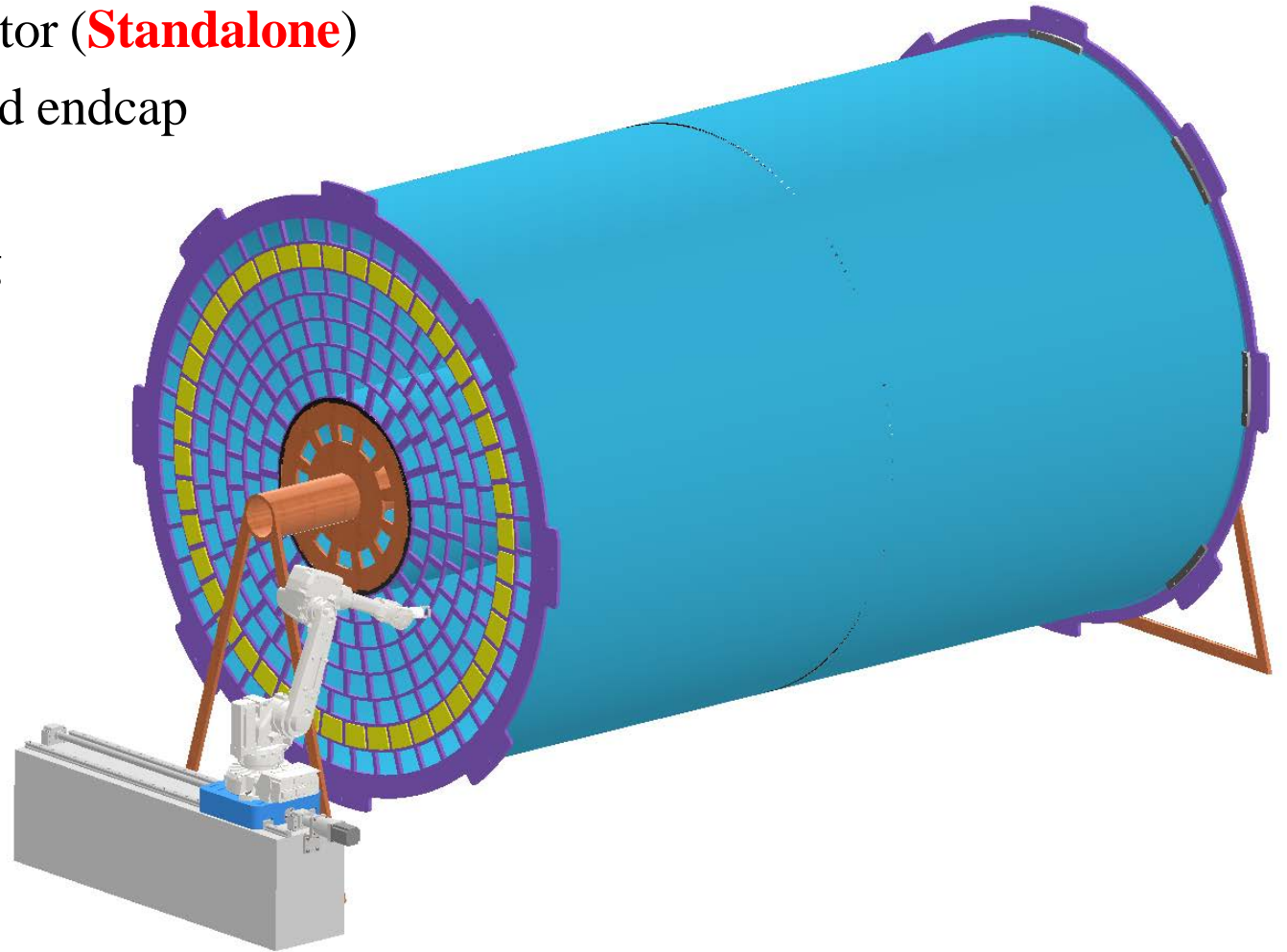
Optimization of TPC module mechanics for TDR

- The mounting of the readout modules requires the specific robot arm to assemble.
 - **Minimum gaps in the readout module boundary.**



Optimization of TPC assembly

- Programme for the installation of TPC detector (**Standalone**)
 - 1. Sealing connection between barrel and endcap
 - 2. Test the sealed of the barrel
 - 3. Fixed TPC using auxiliary supporting
 - 4. Installation of TPC readout modules
 - 5. Integral sealing test
 - 6. Testing the TPC modules
 - 7. Overall equipment installation



Abstracts submitting to CEPC2024

	Presenter	Title	Region	Status	
1	Huirong Qi	Progress of CEPC TPC Towards the TDR	China	Submitted	
2	Mingyi Dong	Status of CEPC DC	China		Confirmed
3	Guang Zhao	Machine Learning for Gaseous Tracker dN/dx Reconstruction	China	Submitted	
4	Zhi Deng	Low power readout ASIC R&D	China		Confirmed
5	Xin She	Studies of TPC detector prototype for the future collide	China	Submitted	
6	Yue Chang	Pixelated readout gas detector for PID	China	Submitted	
7	Canwen Liu	Status of FEE ASIC for TPC	China		Confirmed
8	Jinxian Zhang	Analysis of BK for TPC at the high luminosity Z pole on CEPC	China	Submitted	
9	USTC	MPGD R&D	China		Confirmed
10	SDU	IBF R&D	China		Confirmed
11	CIEA	Micromegas R&D	China		Confirmed
12	PKU	GEM R&D	China		Confirmed
13	SJTU	TPC R&D	China		Confirmed
14	NIKHEF	GridPix TPC	Netherlands		Confirmed
15	CEA-Saclay	T2K TPC	French		Confirmed
16	INFN	DC R&D	Italy		Confirmed
17	INFN	DC electronics R&D	Italy		Confirmed
18	KEK	MPGD TPC R&D	Japan		Confirmed
19	CERN	MPGD R&D	CERN	Inviting	

Many thanks!