

中國科學院高能物理研究所  
*Institute of High Energy Physics*  
*Chinese Academy of Sciences*

# Status of CEPC ref-TDR Chapter06

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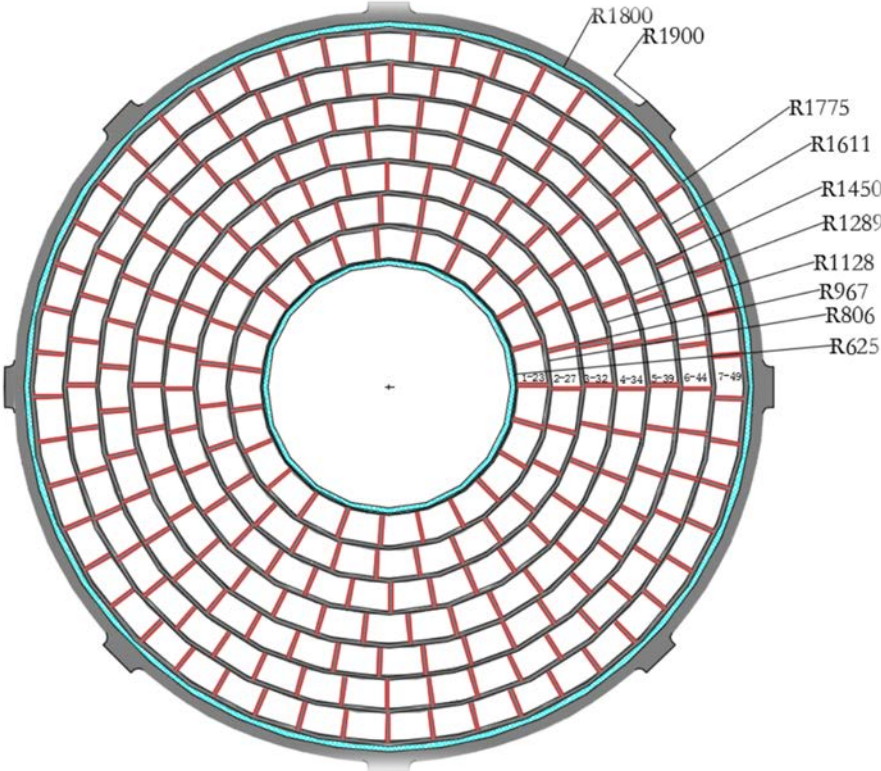
**On behalf of the gaseous tracker group**

**03 December, 2024**

- **Update design of TPC endplate**
- **Status of Chapter6**

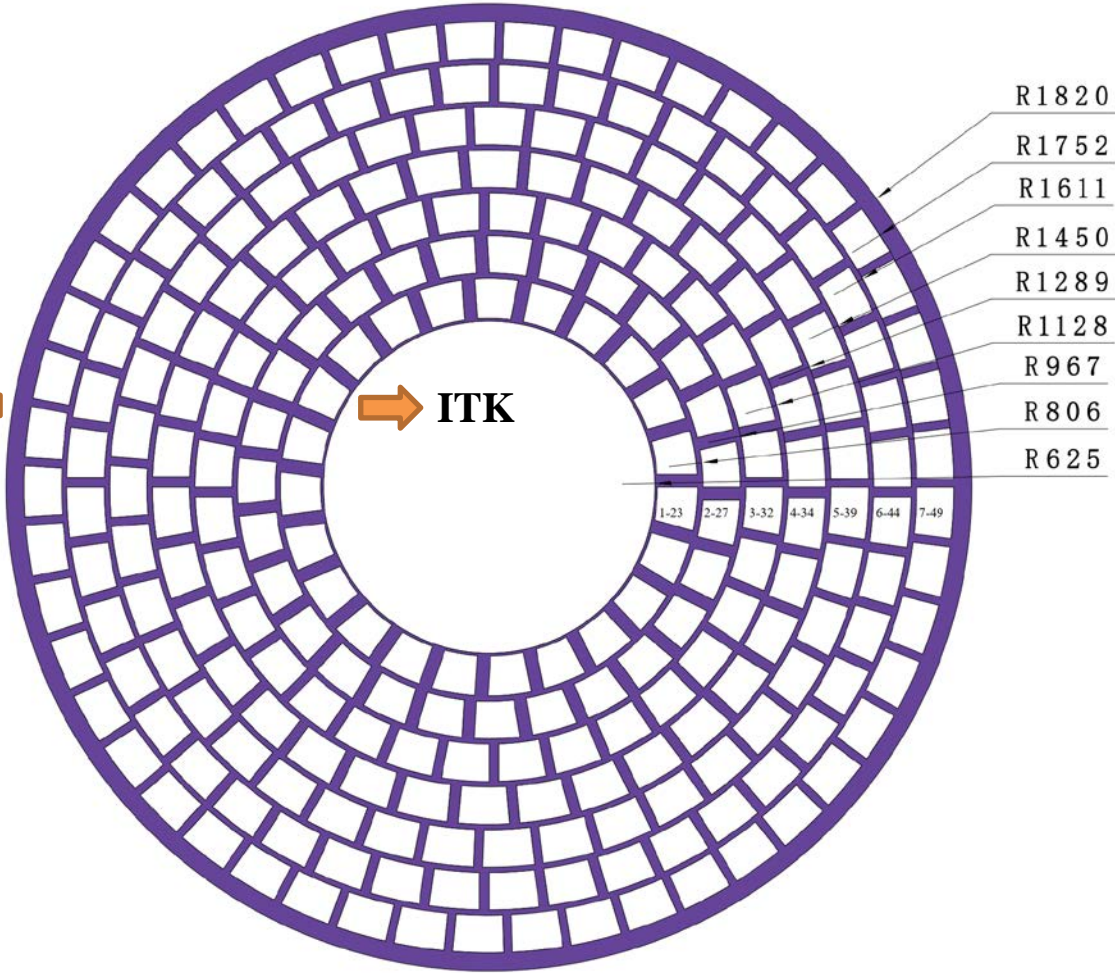
# Update design of TPC endplate

TPC detector	Key Parameters
Modules per endcap	248 modules /endplate
Module size	206mm×224mm×161mm
Geometry of layout	Inner: 1.2m Outer: 3.6m Length: 5.9m
Potential at cathode	- 62,000 V
Gas mixture	T2K: Ar/CF4/iC4H10=95/3/2
Maximum drift time	34μs @ 2.75m
Detector modules	Pixelated Micromegas



OTK

ITK



# Status of Chapter6

## 6.1 Physics requirements

## 6.2 Gaseous tracker system overview

### 6.2.1 Technology comparison

### 6.2.2 Baseline gaseous tracker

### 6.2.3 R&D efforts and results

## 6.3 Pixelated readout Time Projection Chamber

### 6.3.1 Time Projection Chamber detector

### 6.3.2 Pixelated readout electronics

### 6.3.3 Design of mechanical and cooling

### 6.3.4 Commissioning and validation of prototype

### 6.3.5 Challenges and critical R&D

### 6.3.6 Costs

## 6.4 Performance

### 6.4.1 Overview of the simulation framework

### 6.4.2 Physical process in the framework

### 6.4.3 Tracking performance

### 6.4.4 Particle identification

### 6.4.5 Improvement using the machine learning algorithm

### 6.4.6 Beam background source and estimation

### 6.4.7 Alternative the drift chamber

## 6.5 Prospects and outlook

- 整体文档20 页（本周）
- 已整合入IHEP Overleaf文本内
- 下周计划到40页（Draft version）

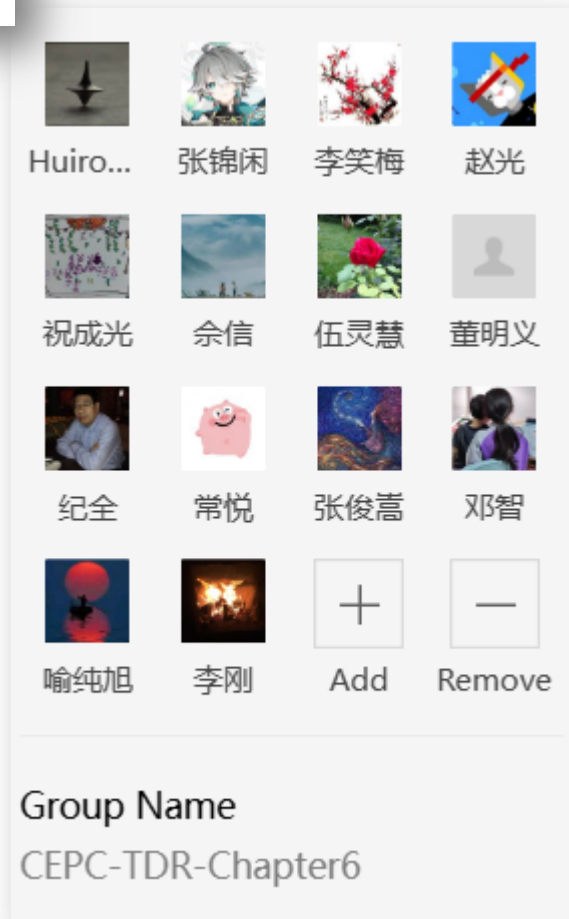
## Comments and suggestions are welcomed.



- Core of the research team (**10 staffs + TPC group**)
  - IHEP: **8 staffs + 4 students**
  - Tsinghua: **2 staffs + 3 students**
- Collaboration of the research team (**6 staffs +10 students + 5 LCTPC members**)
  - TPC:** CIAE, Shandong University, Nankai University, Zhengzhou University and Liaoning University
  - DC:** INFN, Wuhan University, Jilin University
  - TPC and DC:** DRD1 collaboration and LCTPC collaboration
- Organization of team
  - Regular weekly meeting from April 2024
  - Collaboration regular meeting with some international groups



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**Many thanks!**