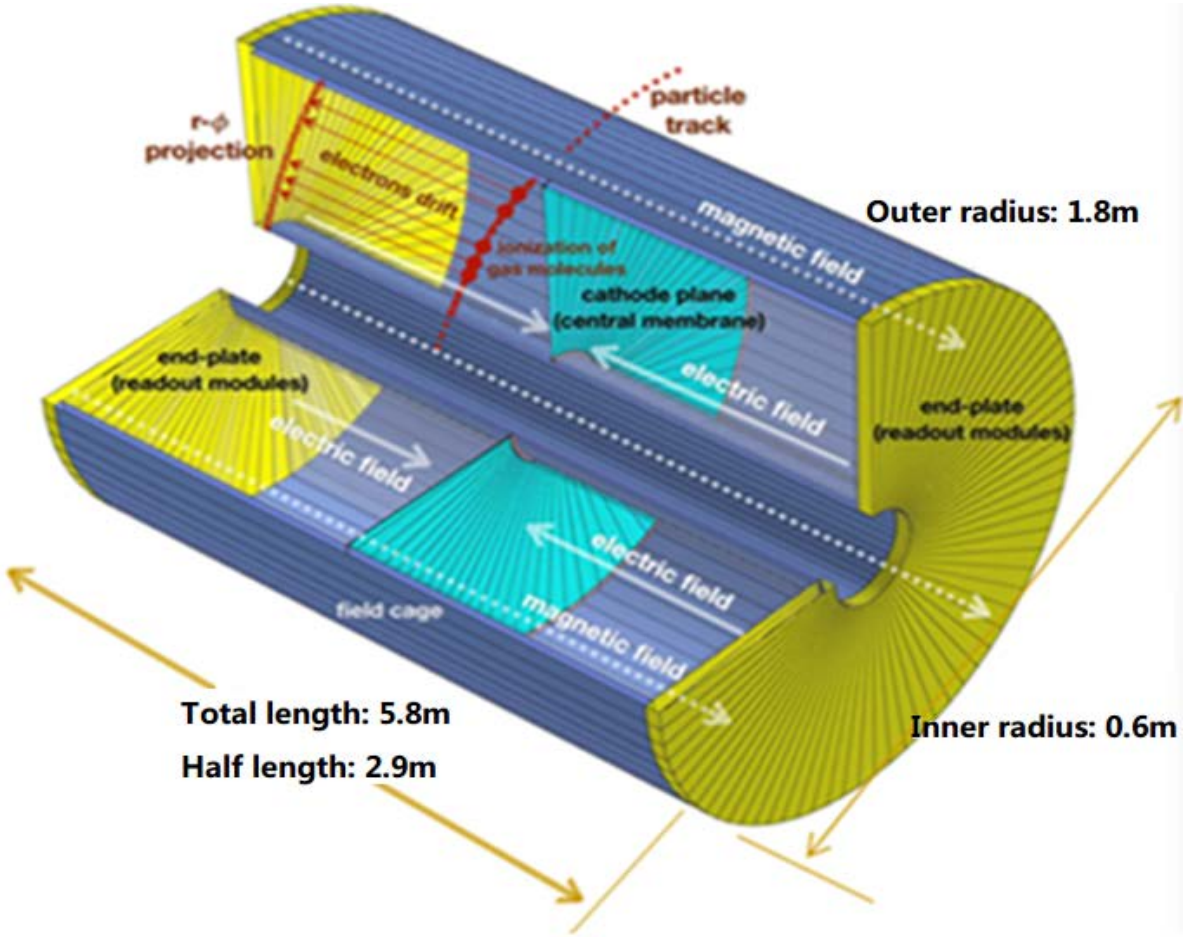
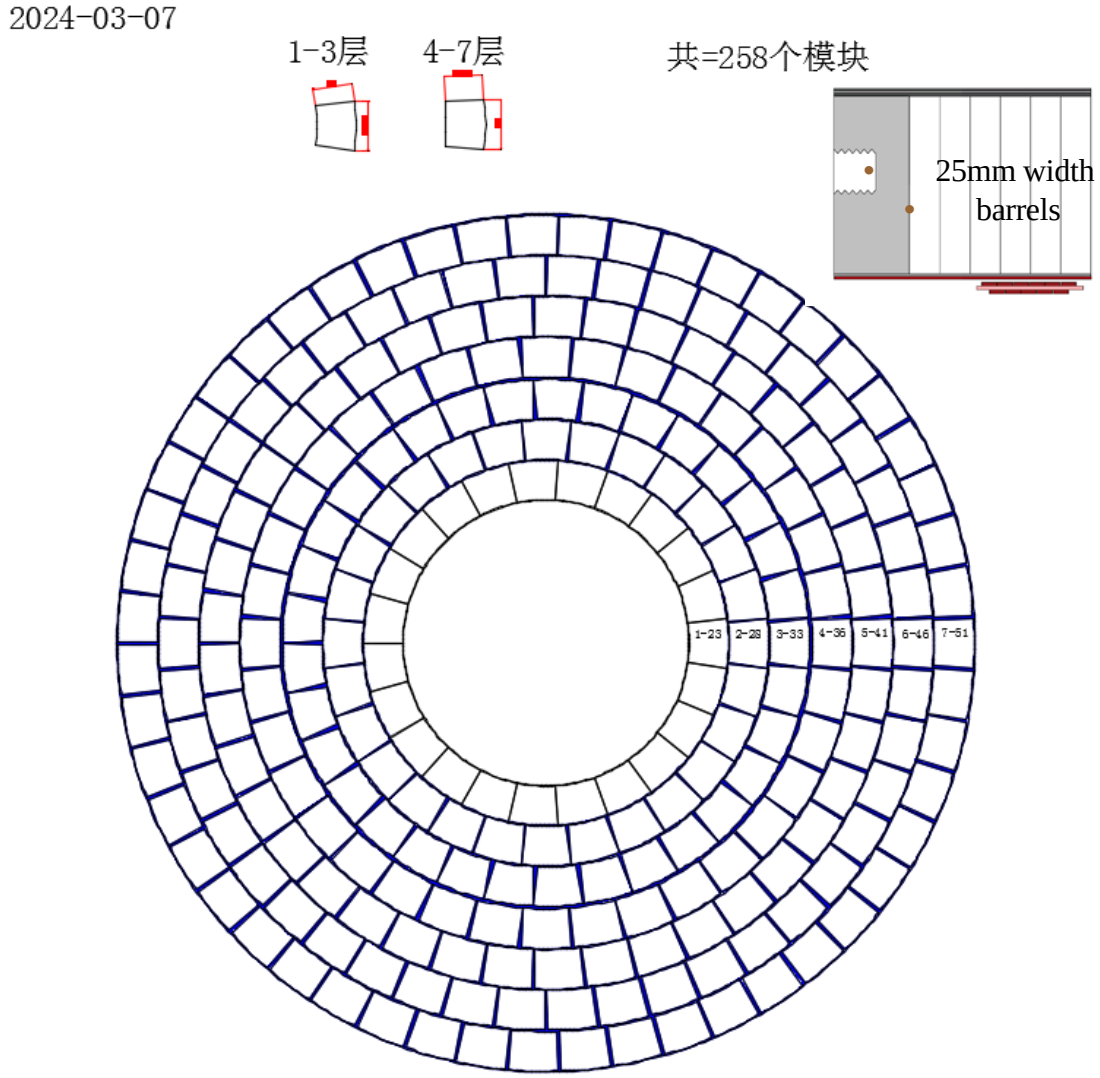
TPC detector in CEPC Phy.&Det. TDR

- General geometry of TPC and the optimization modules in endcap and 25mm width barrels





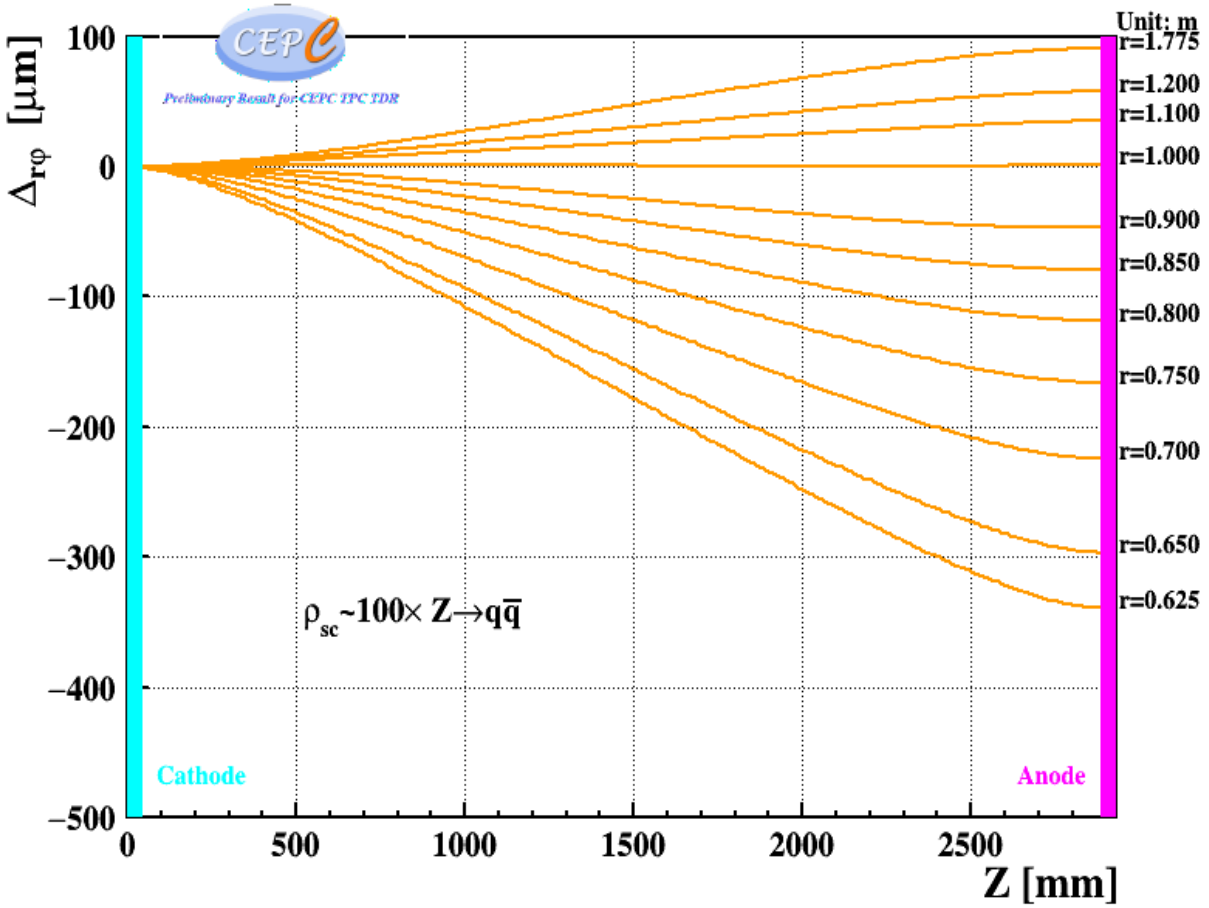
Almost finalized Geometry of TPC detector and the Endplate

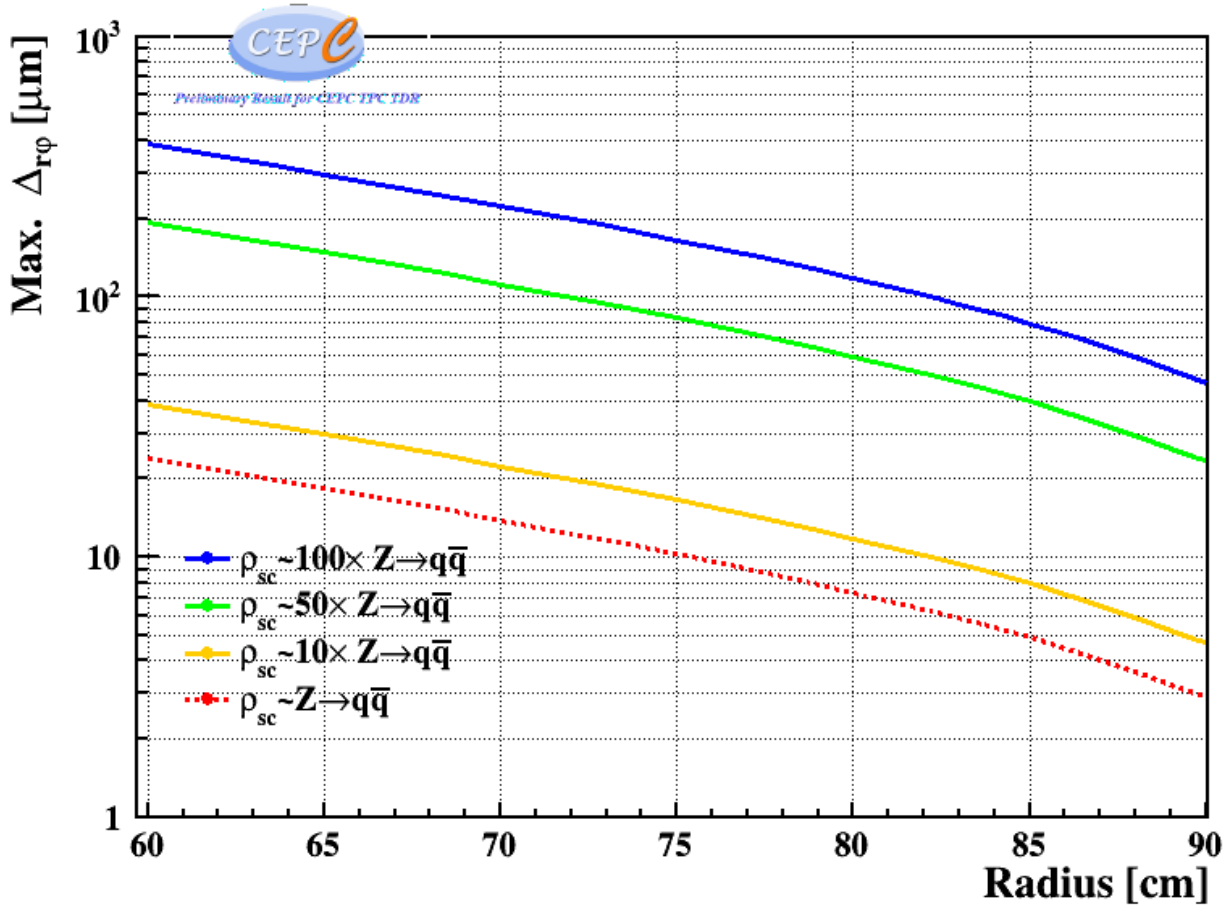
高粒度时间投影室 High granularity readout TPC @cosθ≃0.98

Parameters	Higgs run	Z pole run
B-field	3.0T	2.0T
Pad size (mm)/All channels	0.5mm×0.5mm /2×3×10^7	0.5mm×0.5mm /2×3×10^7
Material budget barrel	≃ 0.012 X_0	≃ 0.012 X_0
Material budget endcap	< 0.17 X_0	< 0.17 X_0
Points per track in rφ	2200	2200
σ_{point} in rφ	≤ 100μm (full drift)	≤ 120μm (full drift)
σ_{point} in rz	≃ 0.1 – 0.5 mm (for zero – full drift)	≃ 0.2 – 0.8 mm (for zero – full drift)
2-hit separation in rφ	< 0.5mm	< 0.5mm
K/π separation power @20GeV	≤ 3σ	≤ 3σ
dE/dx	≤ 3.2%	≤ 3.2%
Momentum resolution normalised: $\sigma_{1/pT} = \sqrt{a^2 + (b/pT)^2}$	a = 1.82 e -5	a = 3.32 e -5
	b = 0.60 e -3	b = 0.92 e -3

Maxim distortion calculation using new geometry

- **Maxim distortion with e+e- to qq at Z pole (物理事例的畸变影响)**
- **Maxim distortion under the different Beamstruggle background (物理事例×10、 ×50、 ×100倍本底的影响)**





PID Performance using dN/dx

- **Separation power分辨结果**
  - **利用重建的簇团来研究π/K鉴别能力，在20GeV和50cm漂移距离下π/K 分辨能力为3σ**
  - **高粒度读出单元具有提高π/K separation power分辨率的潜力**