



TPC Workshop at IHEP

TPC R&D progress for CEE

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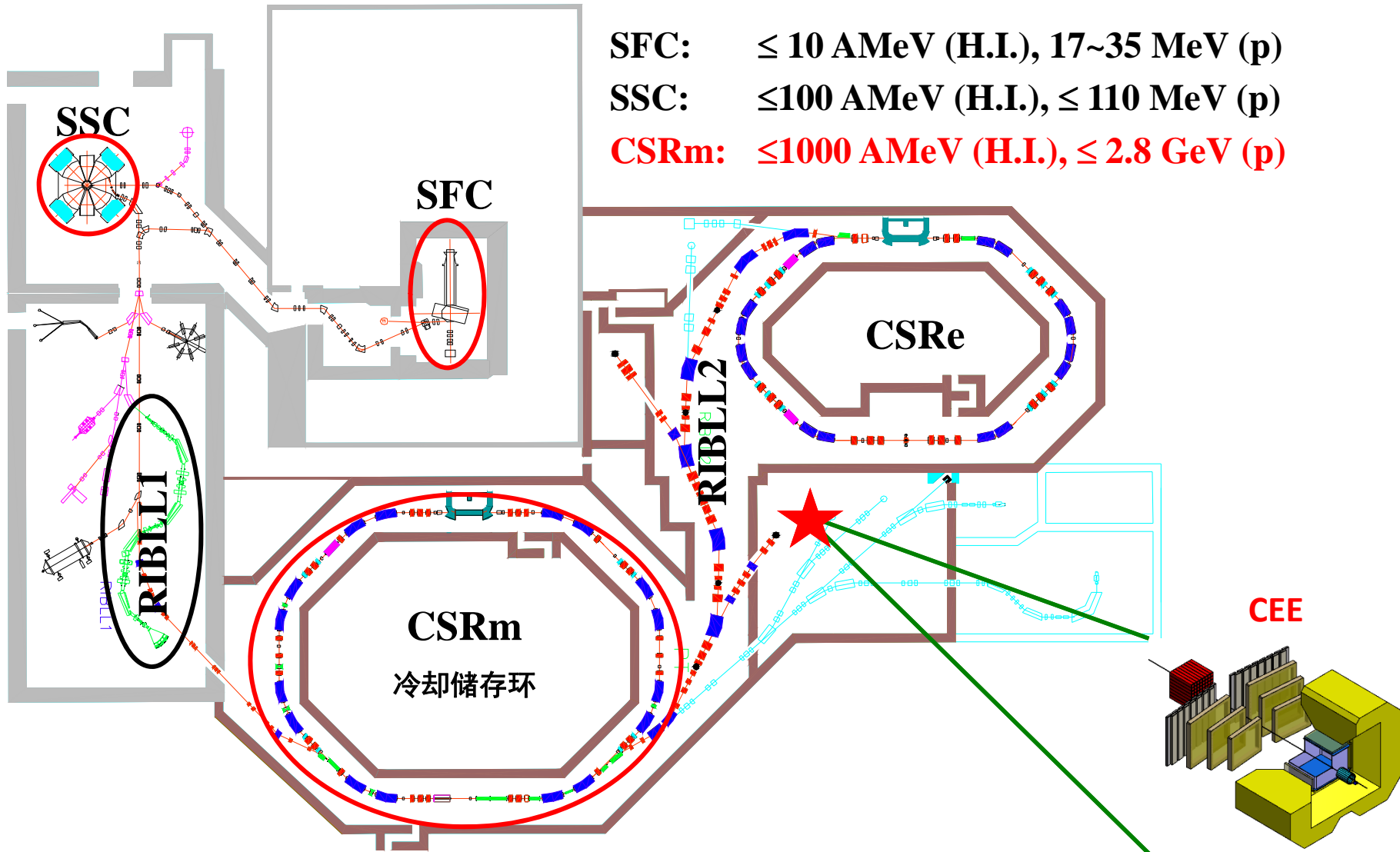
Outline

1. Introduction of CEE
2. Simulations of CEE-TPC
3. TPC prototype
4. Summary and future plan

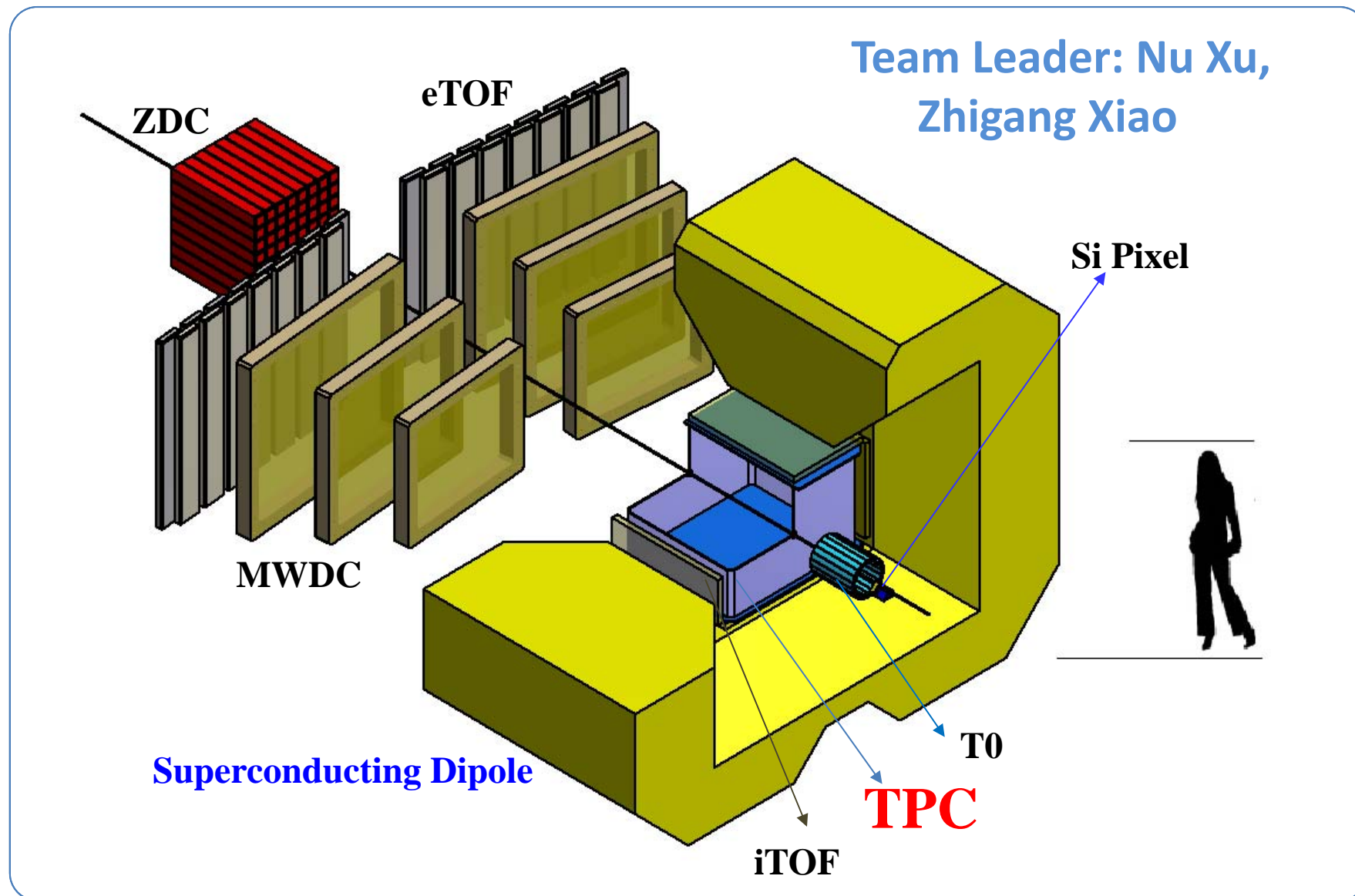
CEE

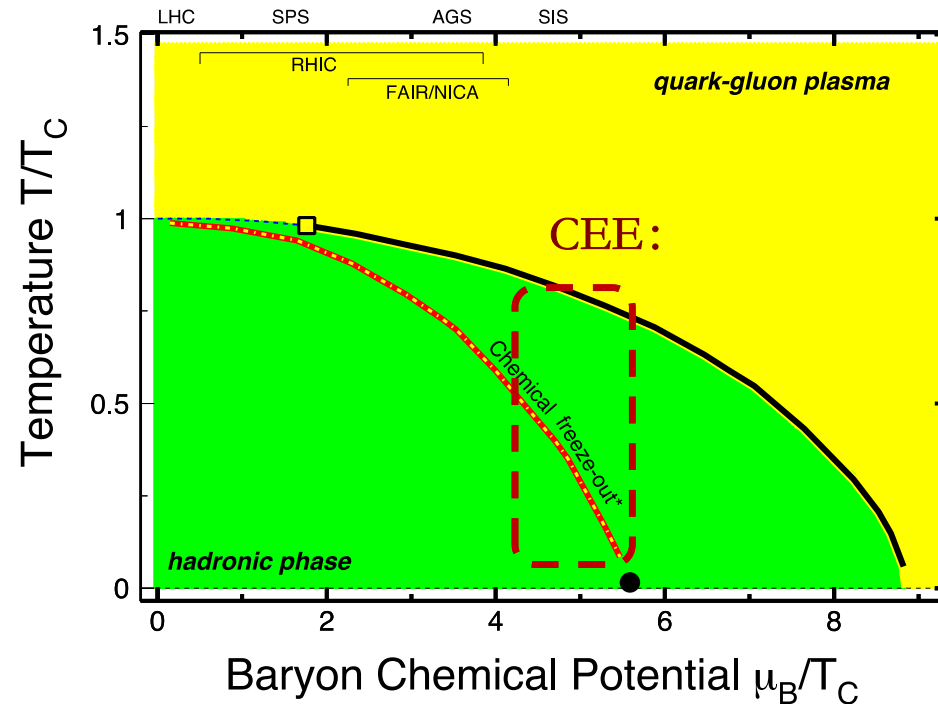
CSR-External-Target-Facility Experiment

Lanzhou HIRFL-CSR:

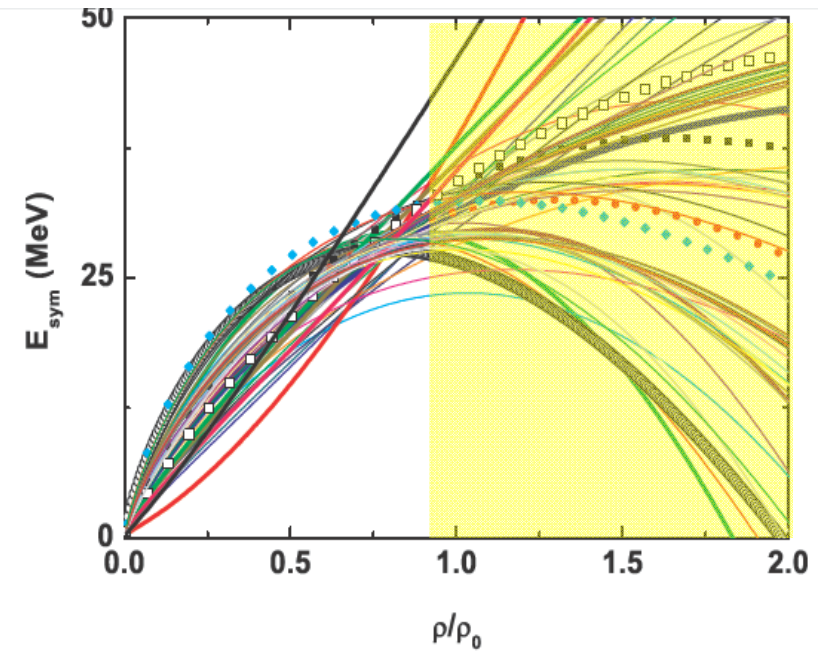


CEE Conceptual Design



Phase Diagram of QCD :

Symmetric Energy:



Study the cold and dense nuclear matter:
 Study the quarkyonic matter
 Help to look for the Critical Point

Study the symmetric energy at $\rho_0 \sim 3\rho_0$

CEE

Conceptual Design of CEE-TPC

GET Electronics

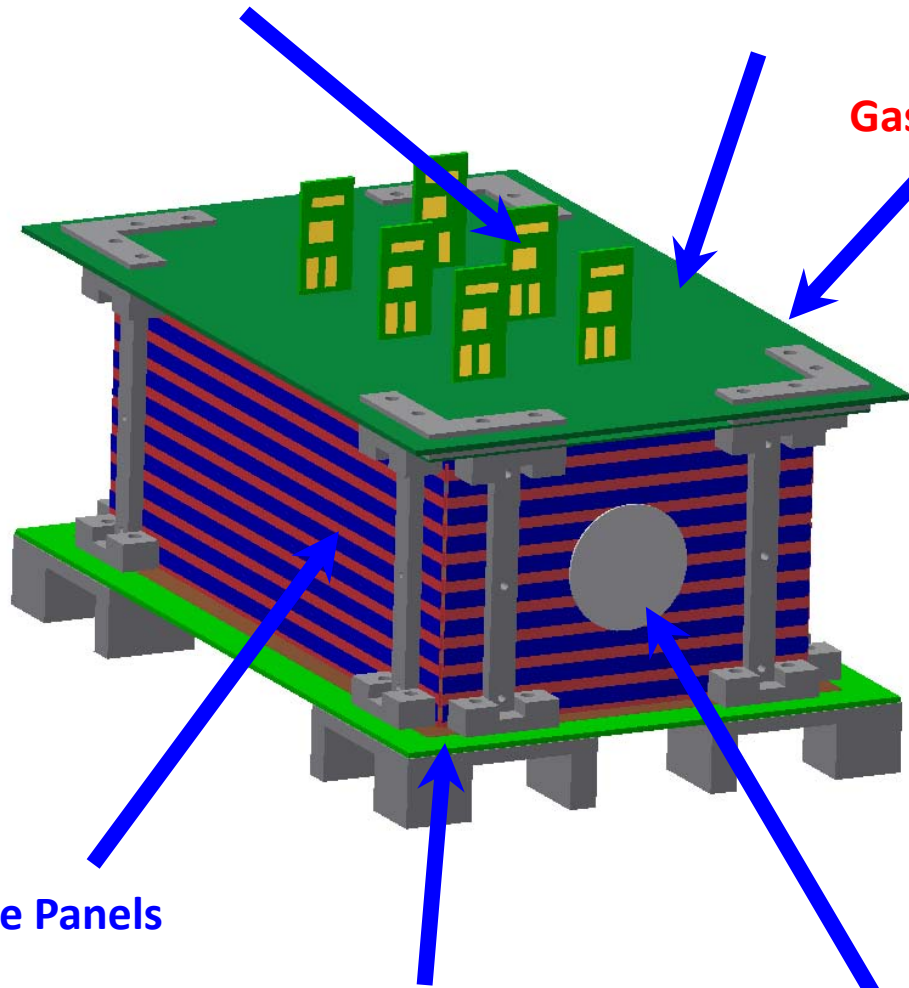
Readout Pad Plane

Gas Electron Multipliers

Side Panels

Cathode Plane

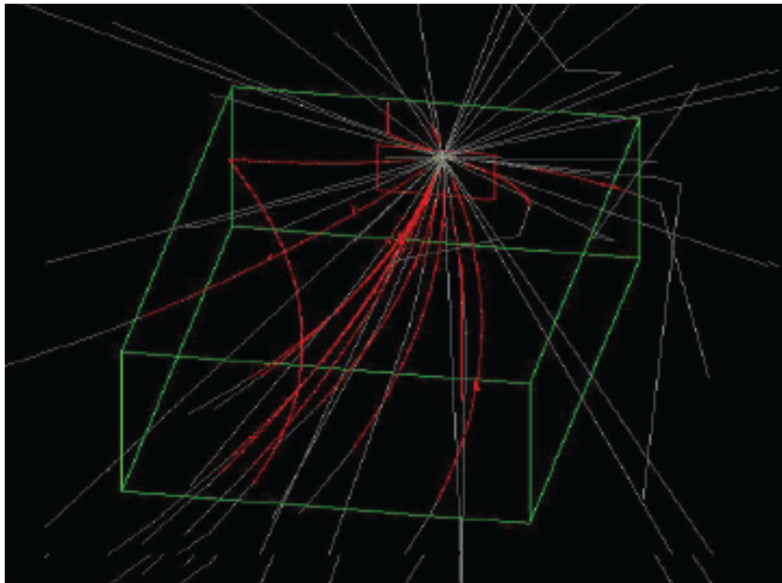
Beam Window



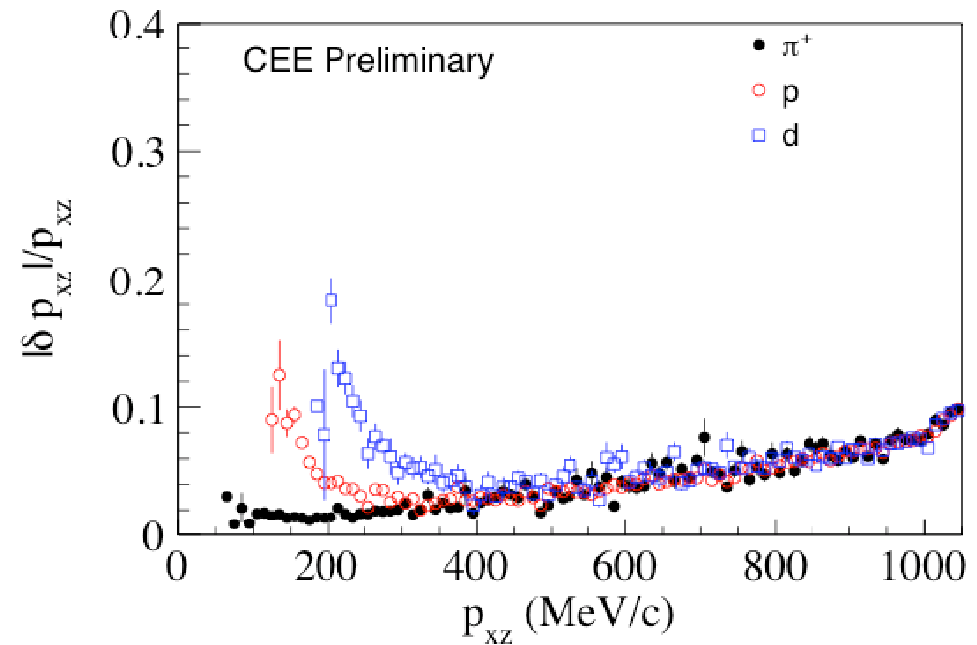
Pad Plane Area	80cm × 100cm
Pads Number	10000
Pads Size	10mm × 8 mm
Drift Distance	80 cm
Gas	90%Ar + 10%CH ₄
E Field Intensity	200V/cm
dE/dx Range	Z ≤ 2, π, p, d, t, He
Momentum Resolution	5%
Two Track Resolution	3 cm
Multiplicity	200
Event Rate	1000Hz

by Dr. Song Zhang

Tracks:



Momentum Resolution:



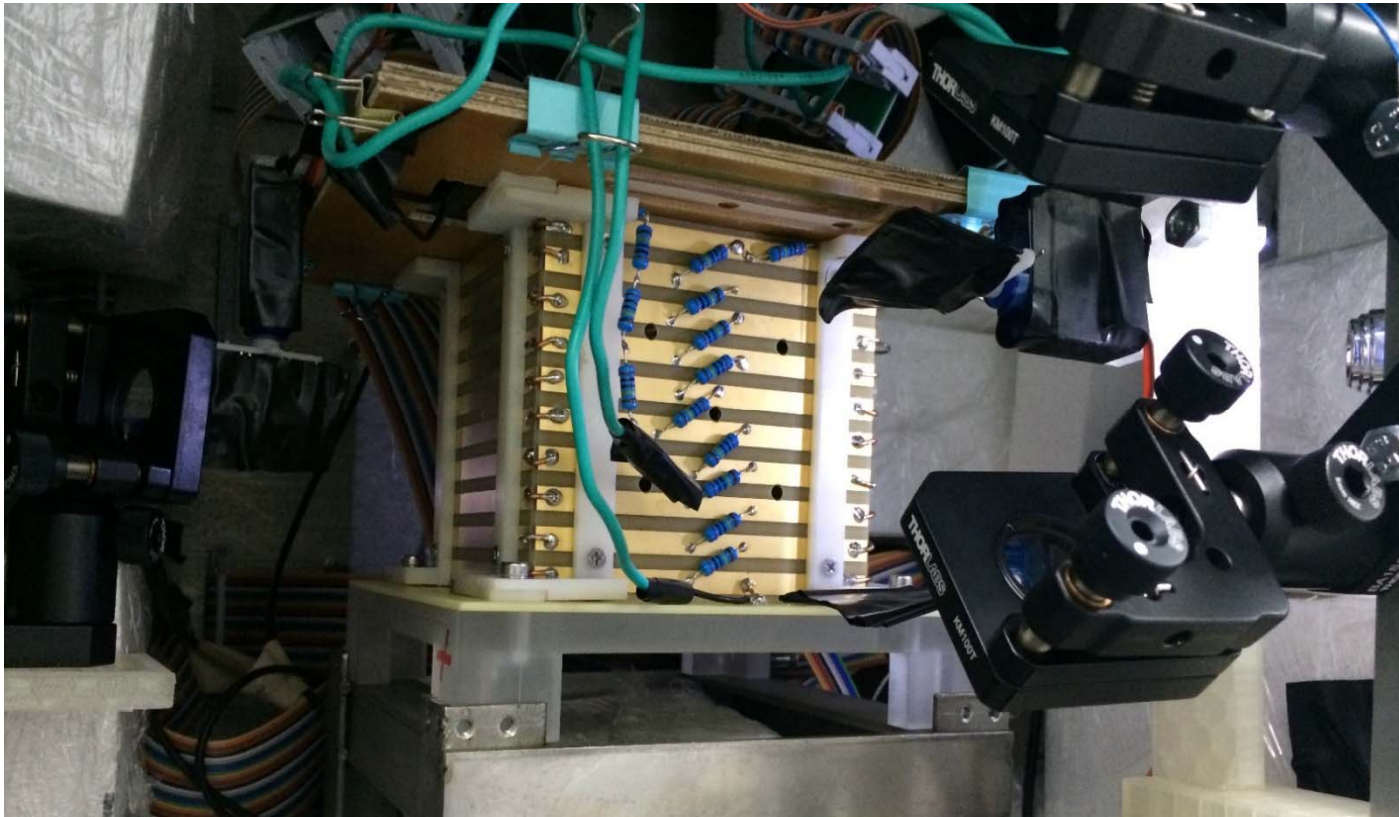
CEE-TPC can meet the requirements in the heavy ion collisions experiment at CSR

TPC Prototype

Prototype of CEE-TPC

Field Cage: 10cm × 10cm × 10cm;

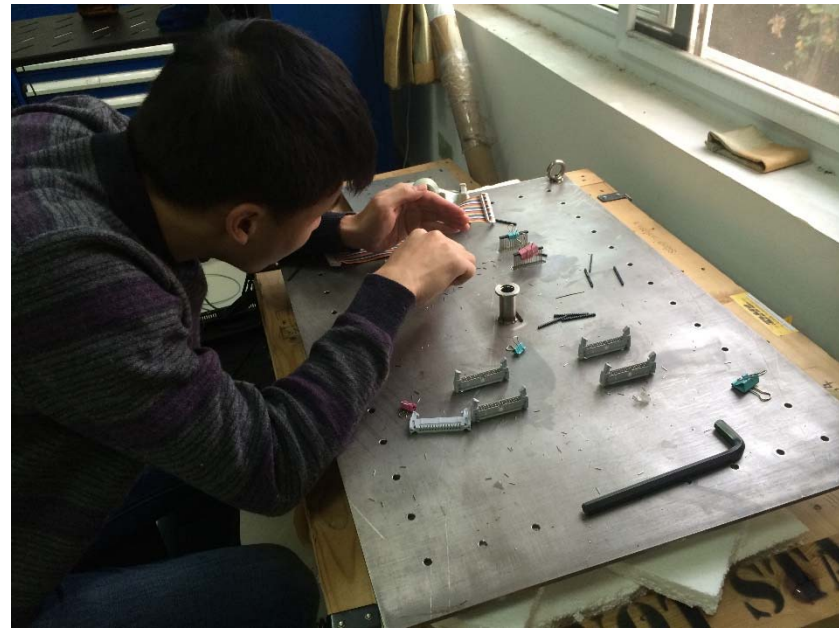
Pads: 64 ch



Electronics: Preamplifier, Shaper,
500M Hz digitizer.

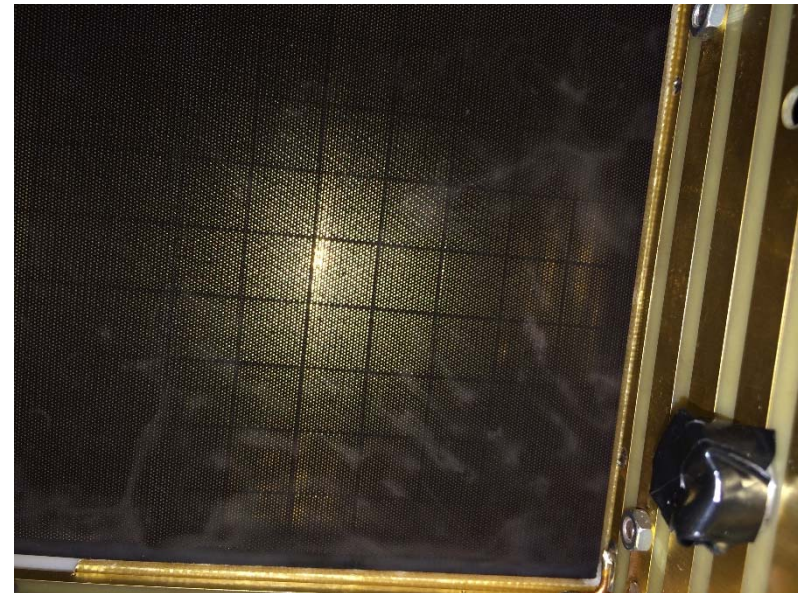
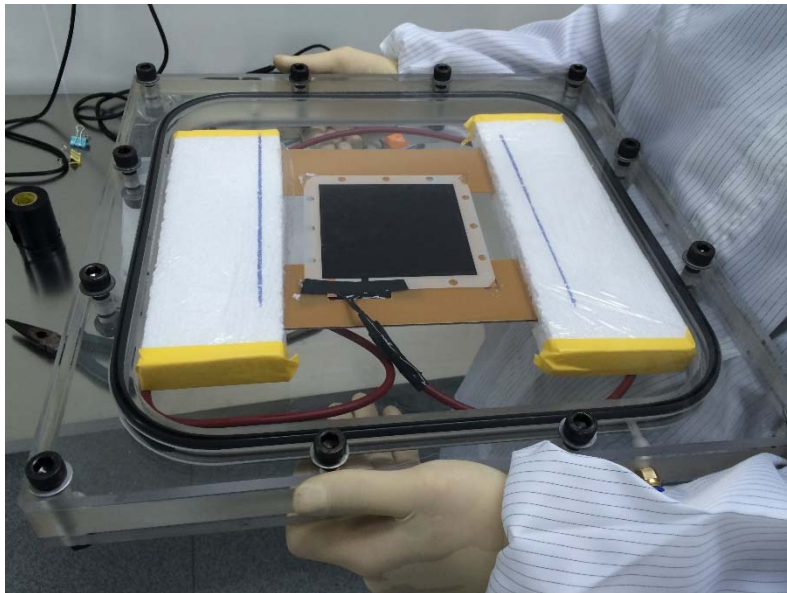
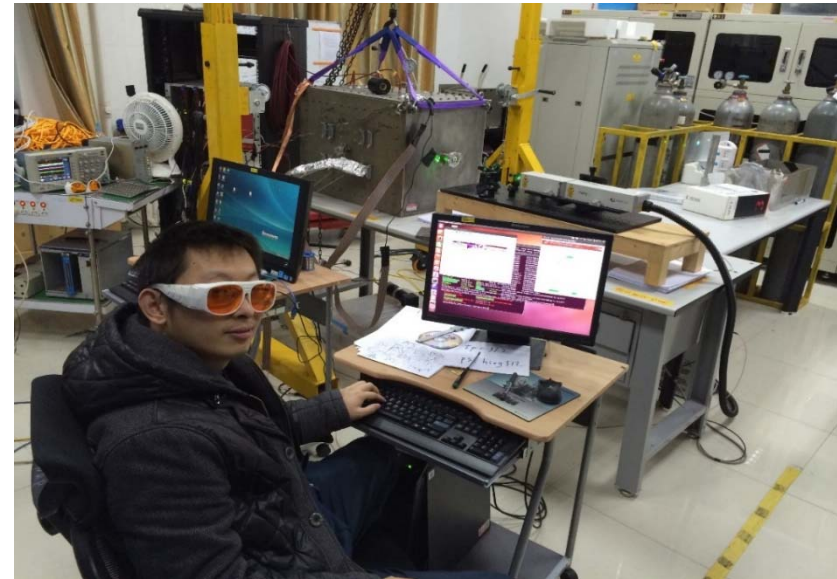
TPC Prototype

Construction of TPC



TPC Prototype

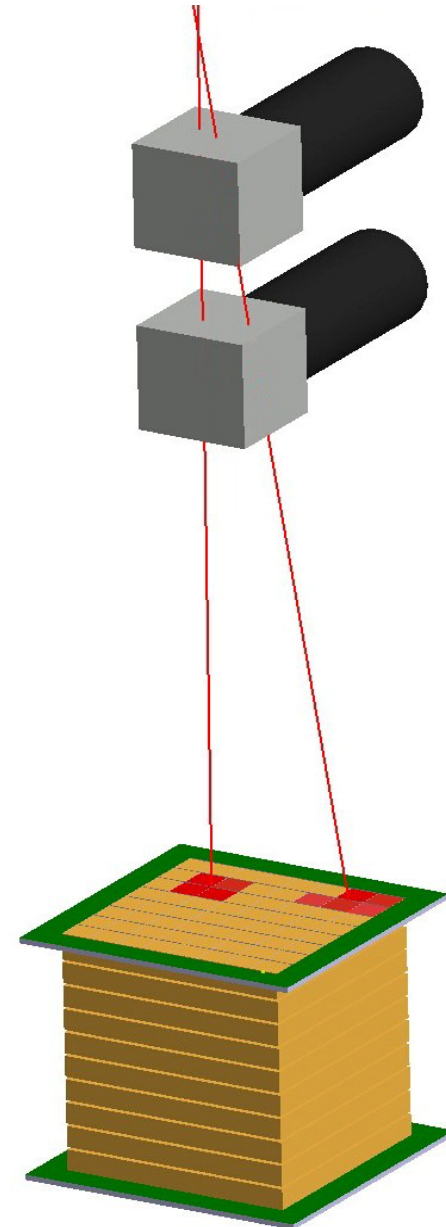
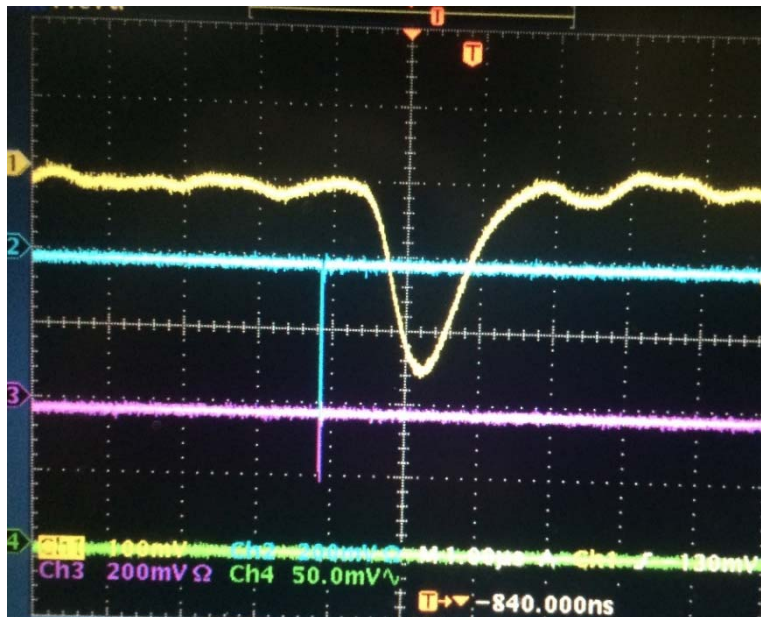
Construction of TPC



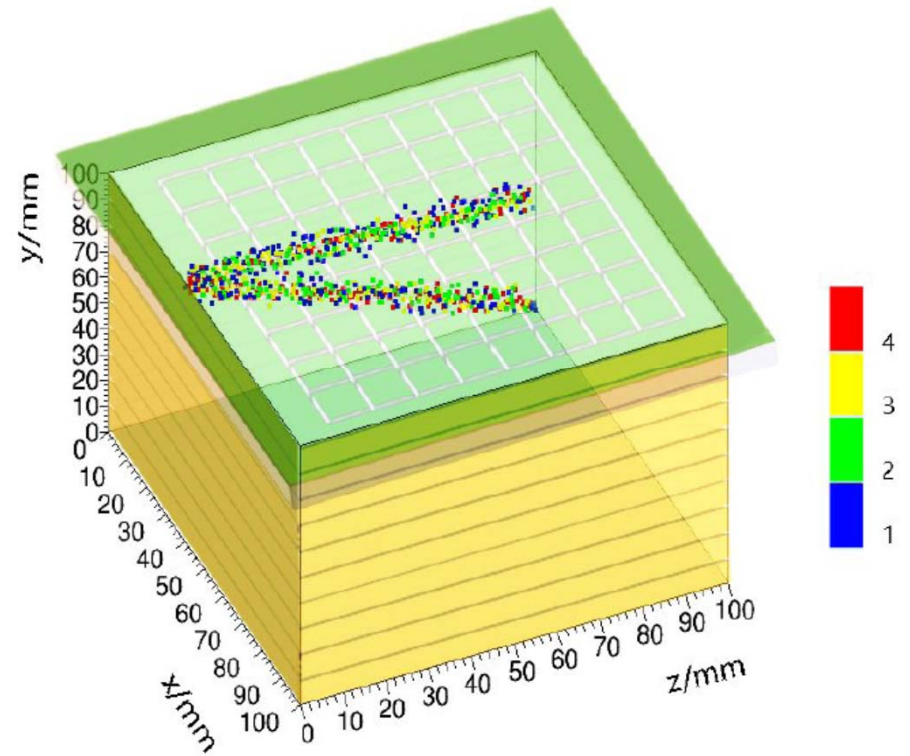
TPC Prototype

Cosmic-ray test

Trigger: 2 scintillator

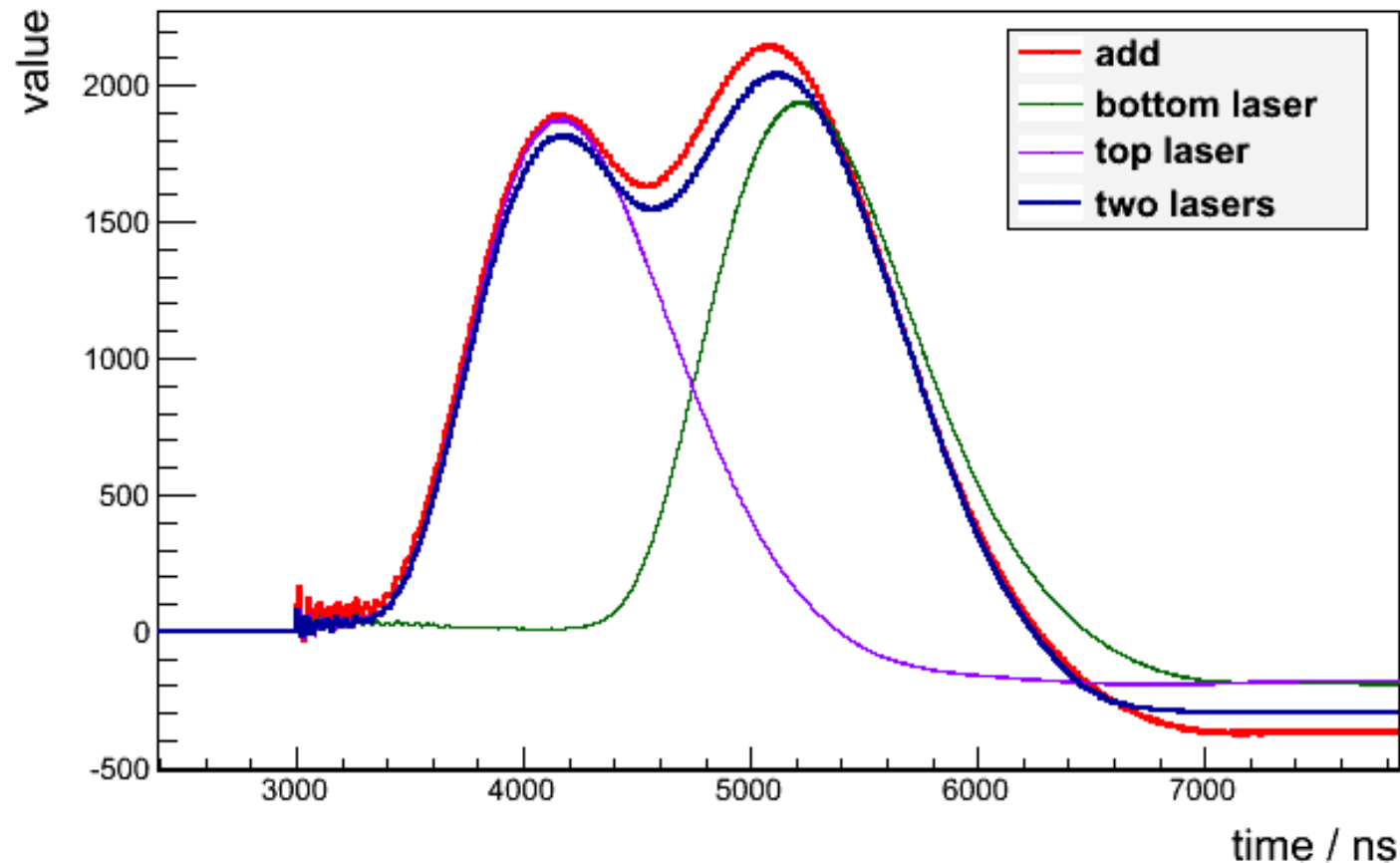


UV Laser : 266nm, 15mJ/pulse, 10Hz



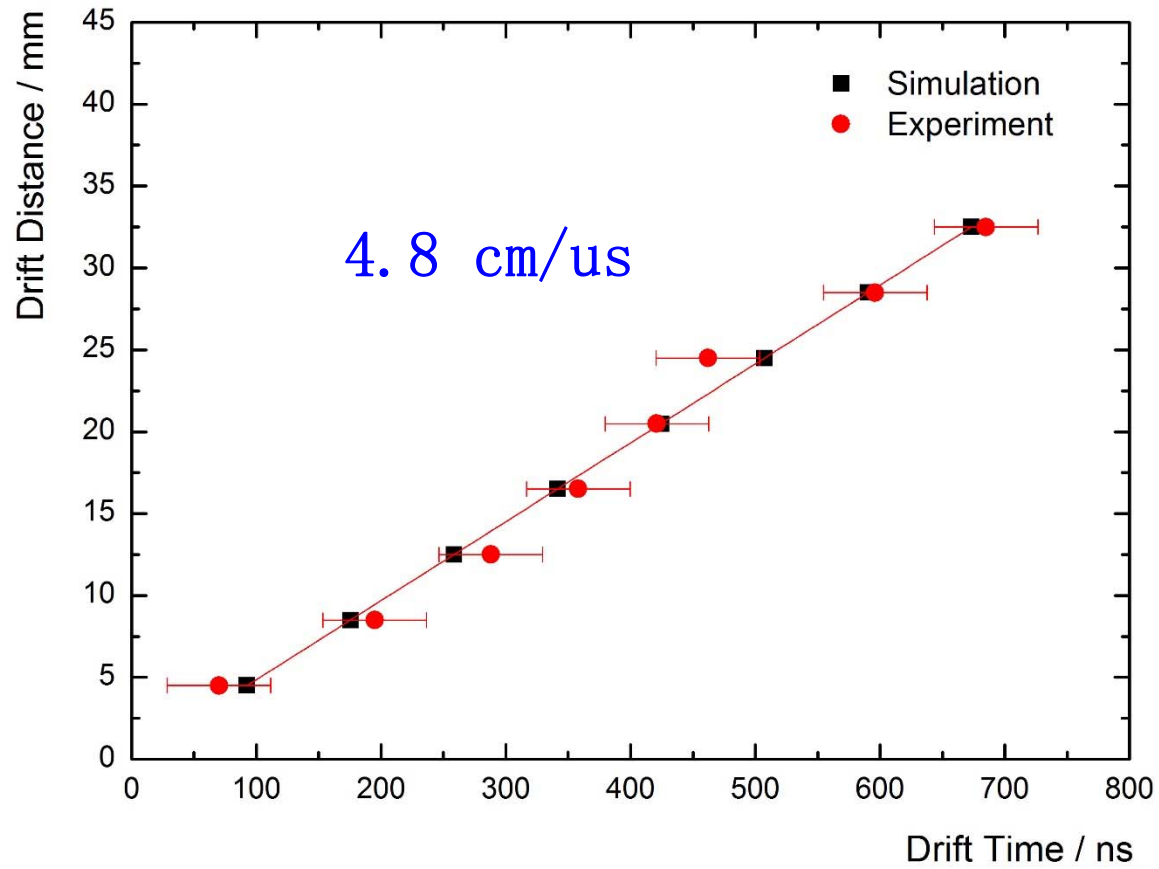
Laser Test

Two simultaneous lasers or not simultaneous lasers



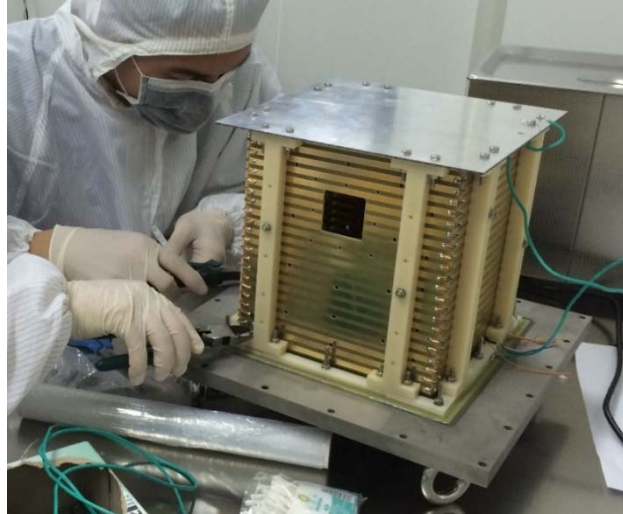
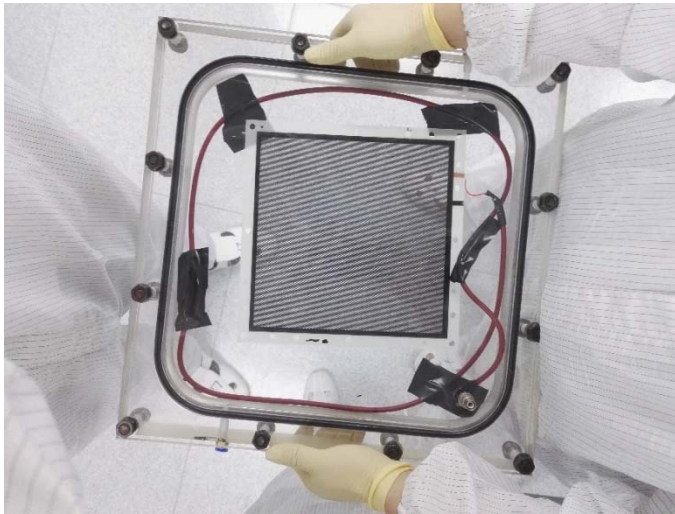
Amplitude: $\frac{\text{Two simultaneous lasers}}{\text{Top Laser} + \text{Bottom Laser}} = 95\%$

Electrons Drift Velocity

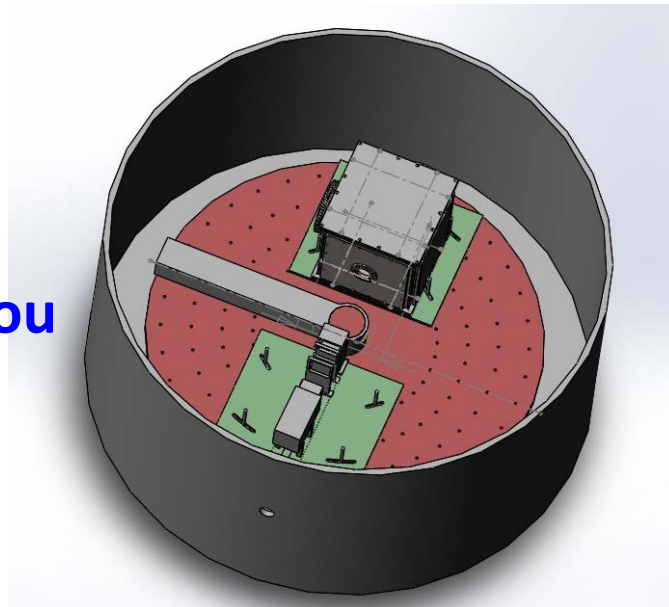


TPC Prototype

Prototype II for Beam Test



Beam Test
Plan at Lanzhou
RIBLL1:





Summary and Future Plan

1. We have made a small prototype of TPC for CEE project. The test results meet the requirement in the heavy ion collisions experiment at CSR.
2. Another prototype of TPC was made. The beam test at Lanzhou will be done.

Thank You !