

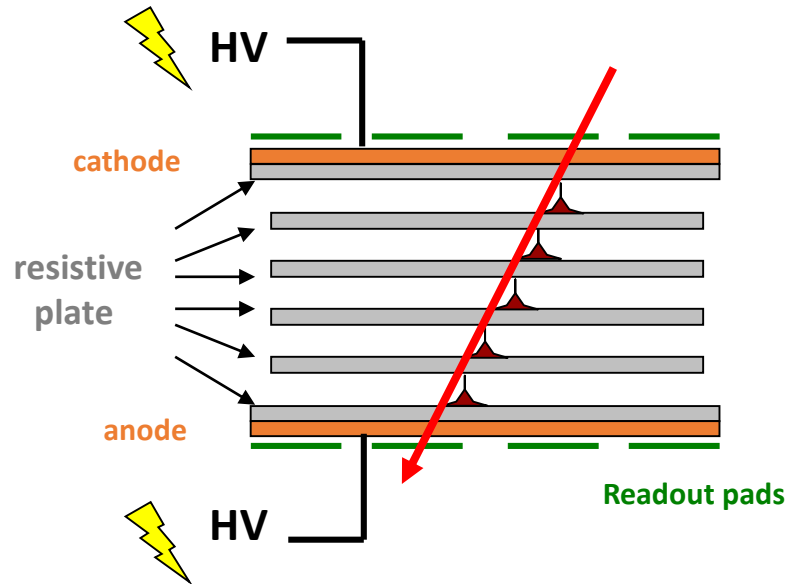
# ALICE TOF (and AIDAInnova)

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On behalf of ALICE-TOF  
and AIDAInnova (WP7: Gaseous Detectors; Task 7.2.1. MRPCs for fast timing)

East Area T9/T10 Users Meeting Thursday 17 March 2022

# ALICE Time of Flight



Multigap Resistive Plate Chamber

Glass plates :  
400 microns thick

Gap width :  
250 microns

Gas mixture:  
93%  
C<sub>2</sub>F<sub>4</sub>H<sub>2</sub>(R134a) 7%  
SF<sub>6</sub>

It measures the time of flight (from the point of generation to the point of detection) of charged particles with a precision of 70 ps

Time and trajectory length (known from tracking detectors) give the particle velocity

From the tracking detectors we find the trajectory, thus the curvature of the track and therefore the momentum

Momentum and velocity give us the mass, which identifies a particle uniquely

# The goal

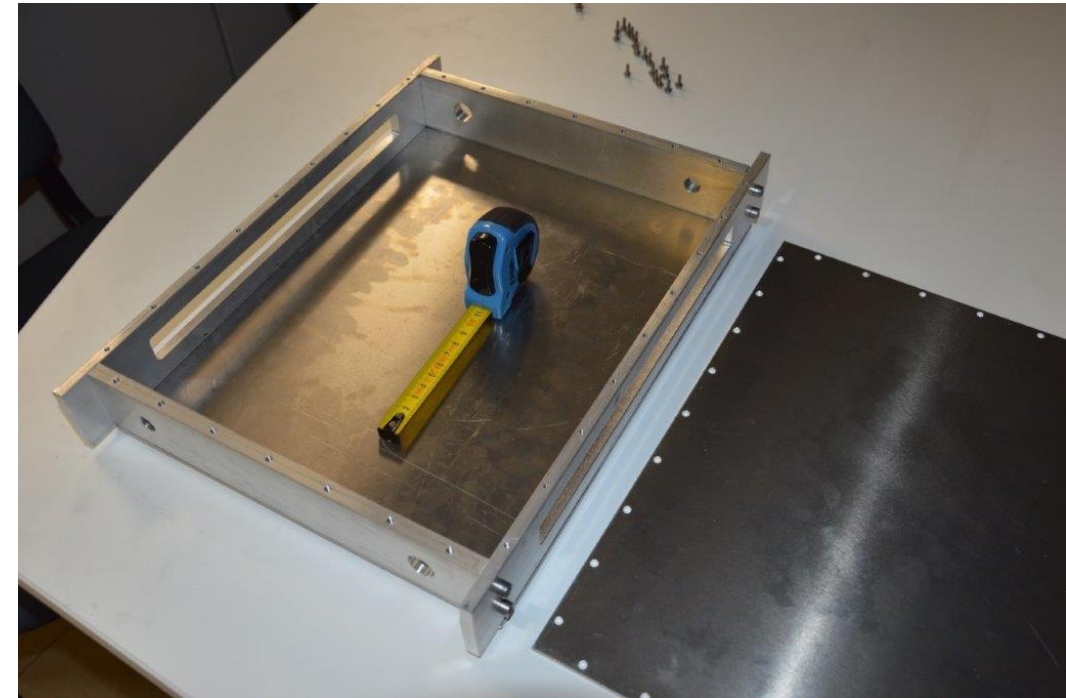
Tests of the performance of few new MRPCs

(small prototypes of about 20cmx20cm and a weight of about 2.5 kg each)

With different configurations of number of gaps and gap width

with 2 different gas mixtures:

- 1) the standard mixture: **93% C<sub>2</sub>F<sub>4</sub>H<sub>2</sub> (R134a) and 7% SF<sub>6</sub> as baseline**
  - 2) ecological gas: **R1234ze (Eco-Freon in a mixture with the SF<sub>6</sub>)**
- in both cases, optimal flow: 5l/h (minimum flow: 2l/h)



Mechanical structure to contain the MRPCs

# Beam Requirements @ PS (East Hall)

Beam Line: <b>T10</b>					
Particle type	Polarity	Momentum	Intensity	Beam Size	Target
hadrons	negative	max	max	focus 2cmx2cm	hadron

## Infrastructure Requirements

### Requirement @ T10:

movable table (with max 3 chambers) to center the beam spot more easily and to scan in different points of the chamber.

**Requirement concerning gas: Add another line for R1234ZE**