Designing, Building and Testing a Multi Wire Proportional Chamber
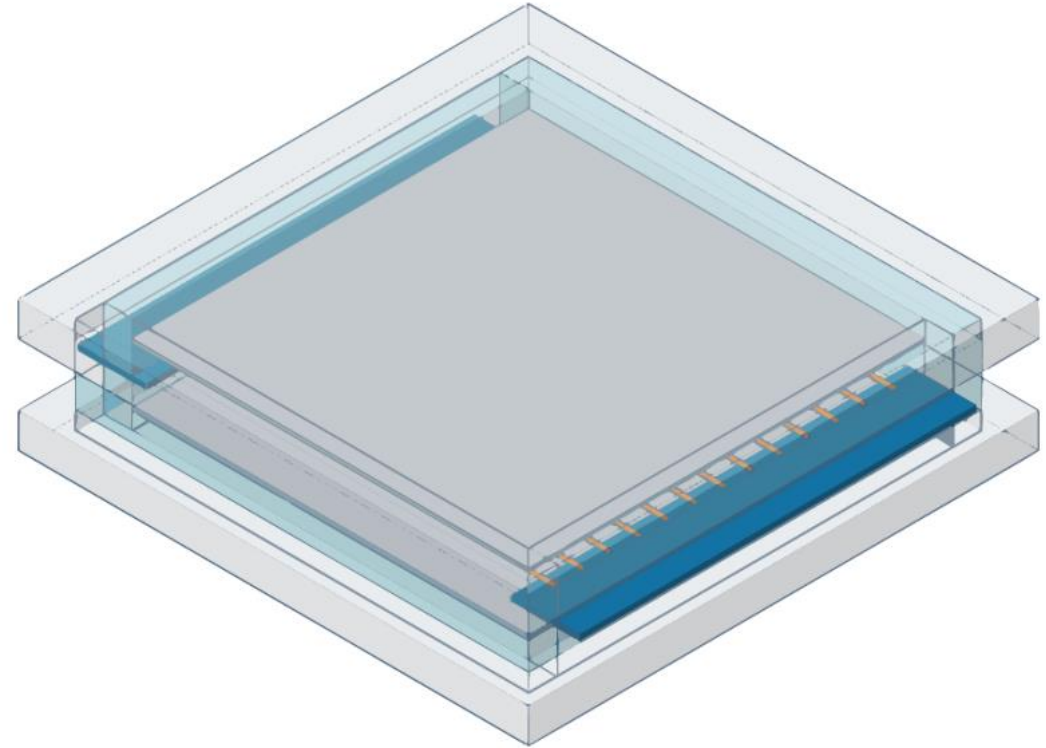
By Leon Verreijt, Cas van Rossum, Victor Souljé, Sela Hoeijmans, Tijmen de Graaf

Introduction team members

- Victor Souljé
- Leon Verreijt
- Sela Hoeijmans
- Tijmen de Graaf
- Cas van Rossum
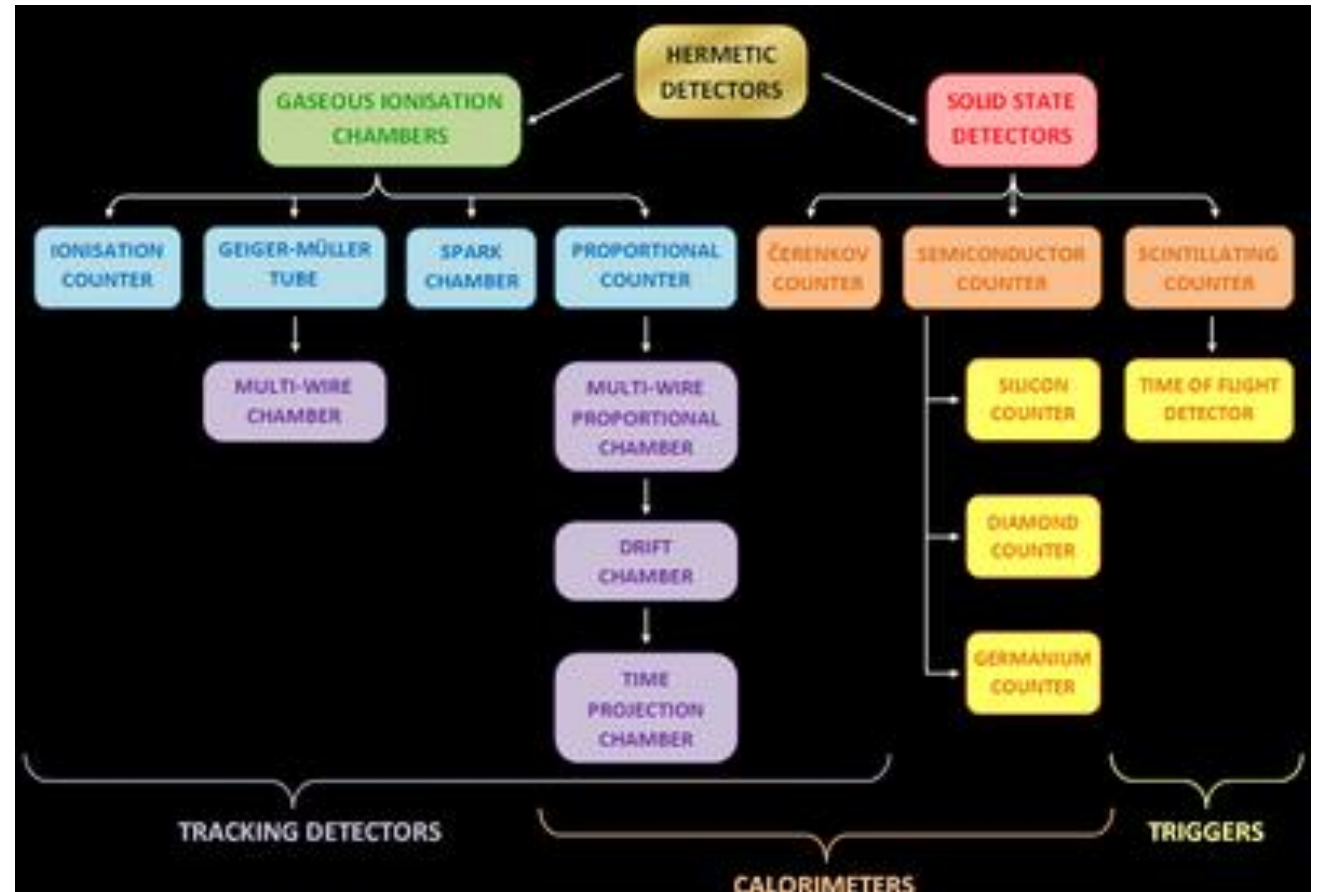- Tim Bouchée (mentor)
- Hans van Luijtelaar (mentor)

Goal

- Designing, building and testing a homemade particle detector.

- Why do we find this interesting?

3D model of our first design in Tinkercad

Types of particle detectors

- Gaseous ionisation

- Construction

- Spark & Cloud

Detector of choice

- **MWPC** because the MWPC is a versatile detector that can be constructed from relatively easy to get materials. It's also a highly customizable detector and can collect data well (as it can give information about the particle track and energy if used properly)
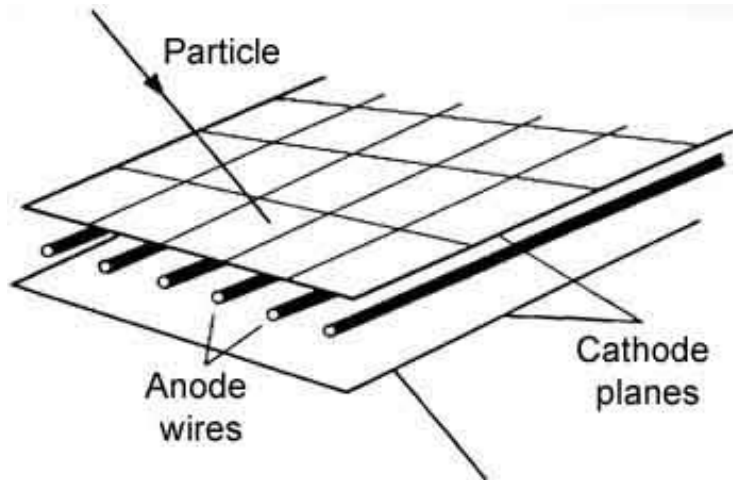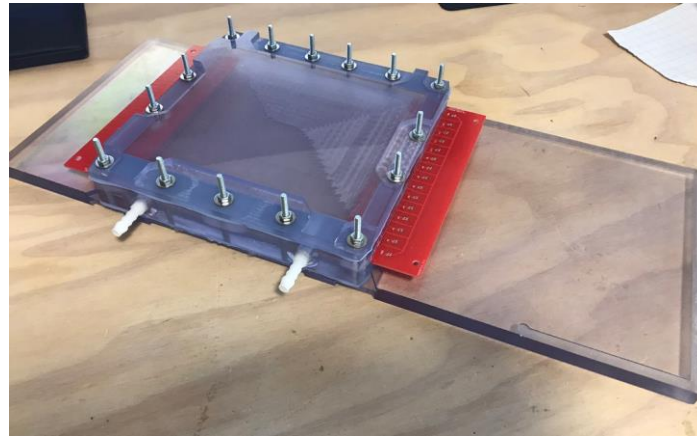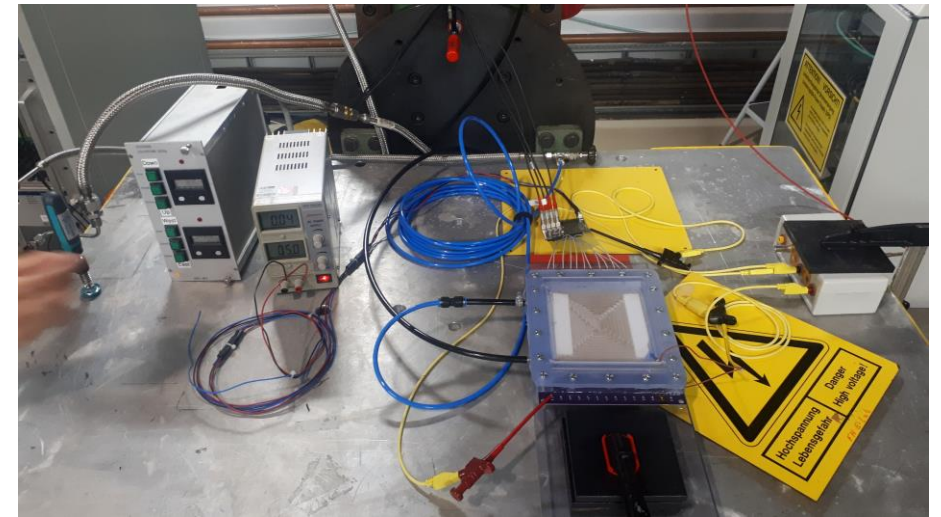
Preparation

- Construction of various prototypes
- First signals in operational mode
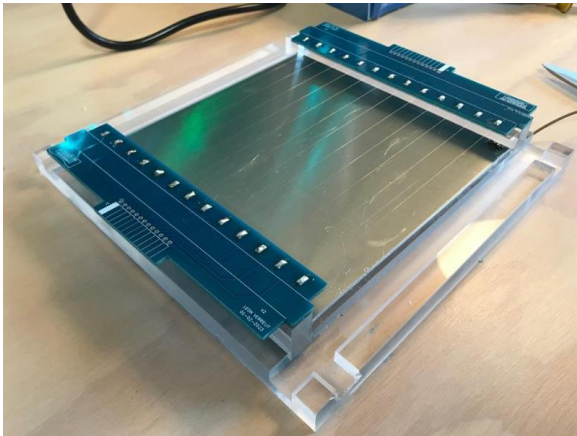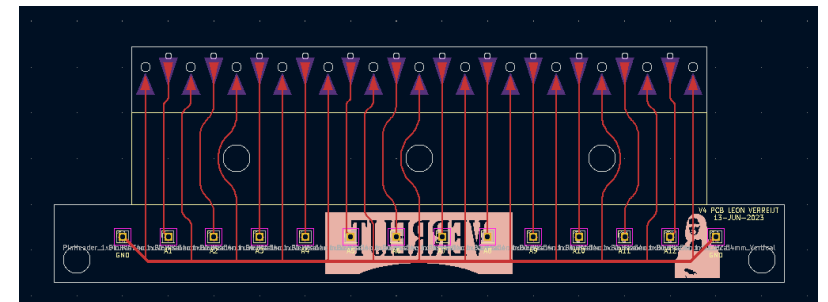

Building the second version
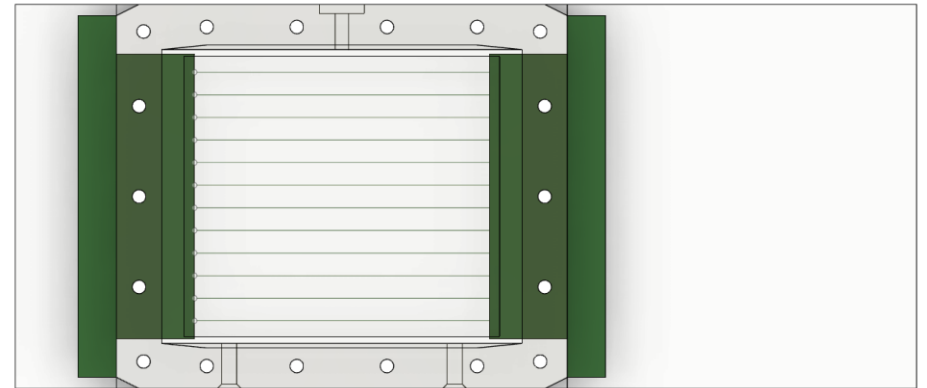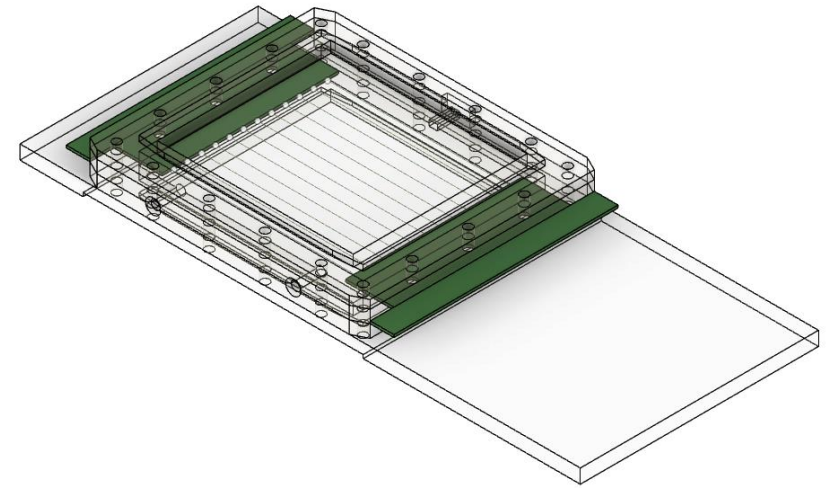

Fourth version
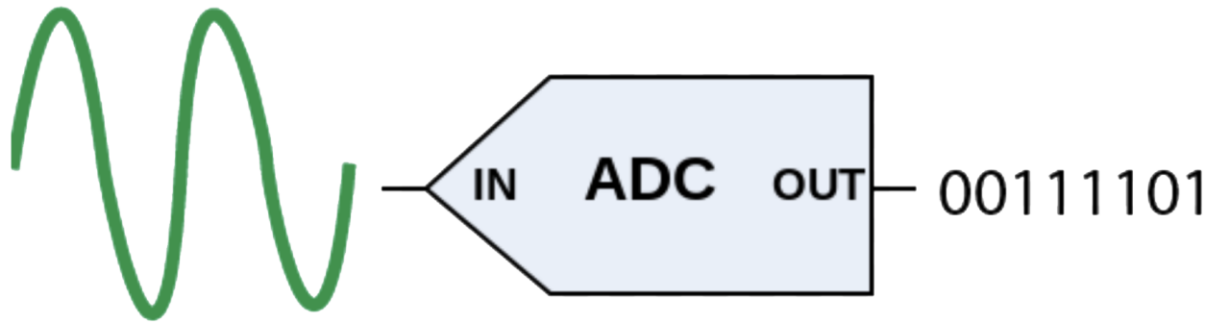

Sixth version in operational mode

Method

- Experimental setup
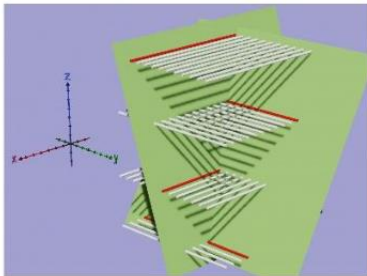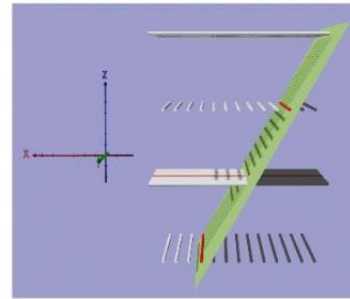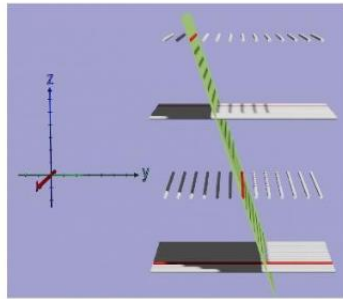
Design

- Key features of the most recent version
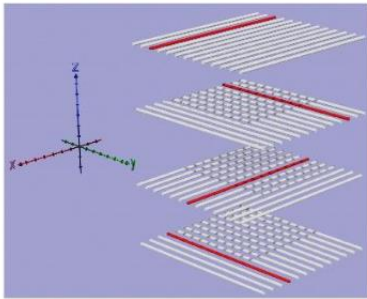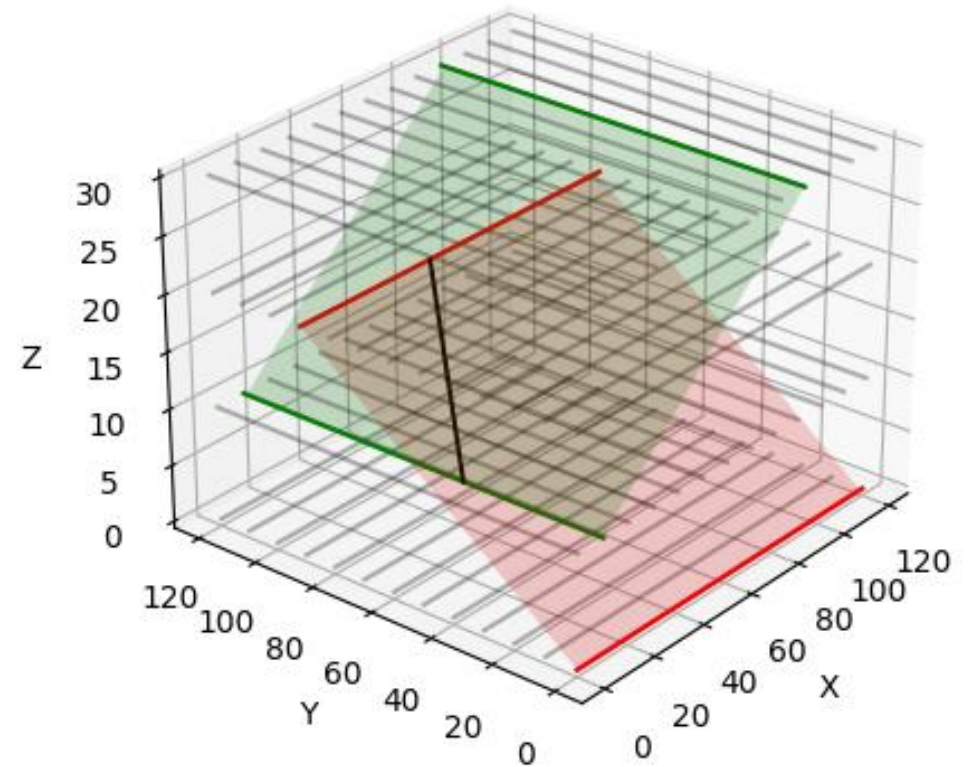
DAQ

- Amplification
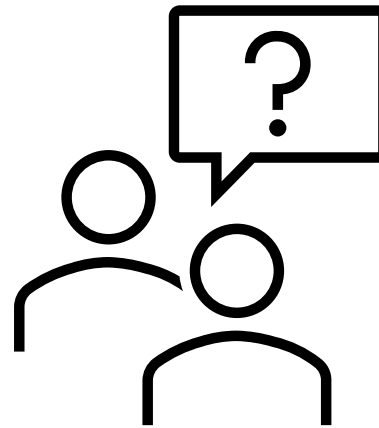- Conversion

Analysis

- Visualisation
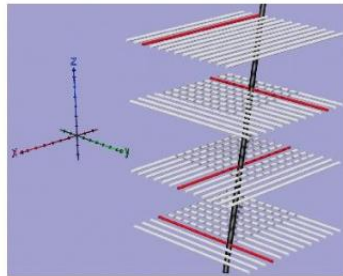
1. Highlight every wire that registered a particle.
2. Draw a plane on the wires of chambers 1&3.
3. Draw a plane on the wires of chambers 2&4.
4. Draw both planes, and let them intersect.
5. Draw a line on the intersection.

The particle's path is now visualised.

What we hope to get from DESY

Assistance

Facilities

Timetable

Task\Day	1	2	3	4	5	6	7	8	9	10
T1	×	×								
T2	×	×	×							
T3			×	×						
T4				×	×	×				
T5					×	×	×			
T6	×							×	×	×

Task 1: Developing reliable amplification circuits
Task 2: Developing a program that will visualize the particles
Task 3: Setting up the detector
Task 4: Reviewing and improving/calibrating our setup
Task 5: Processing data

Community contribution

- Social media
- Teacher network??

Questions