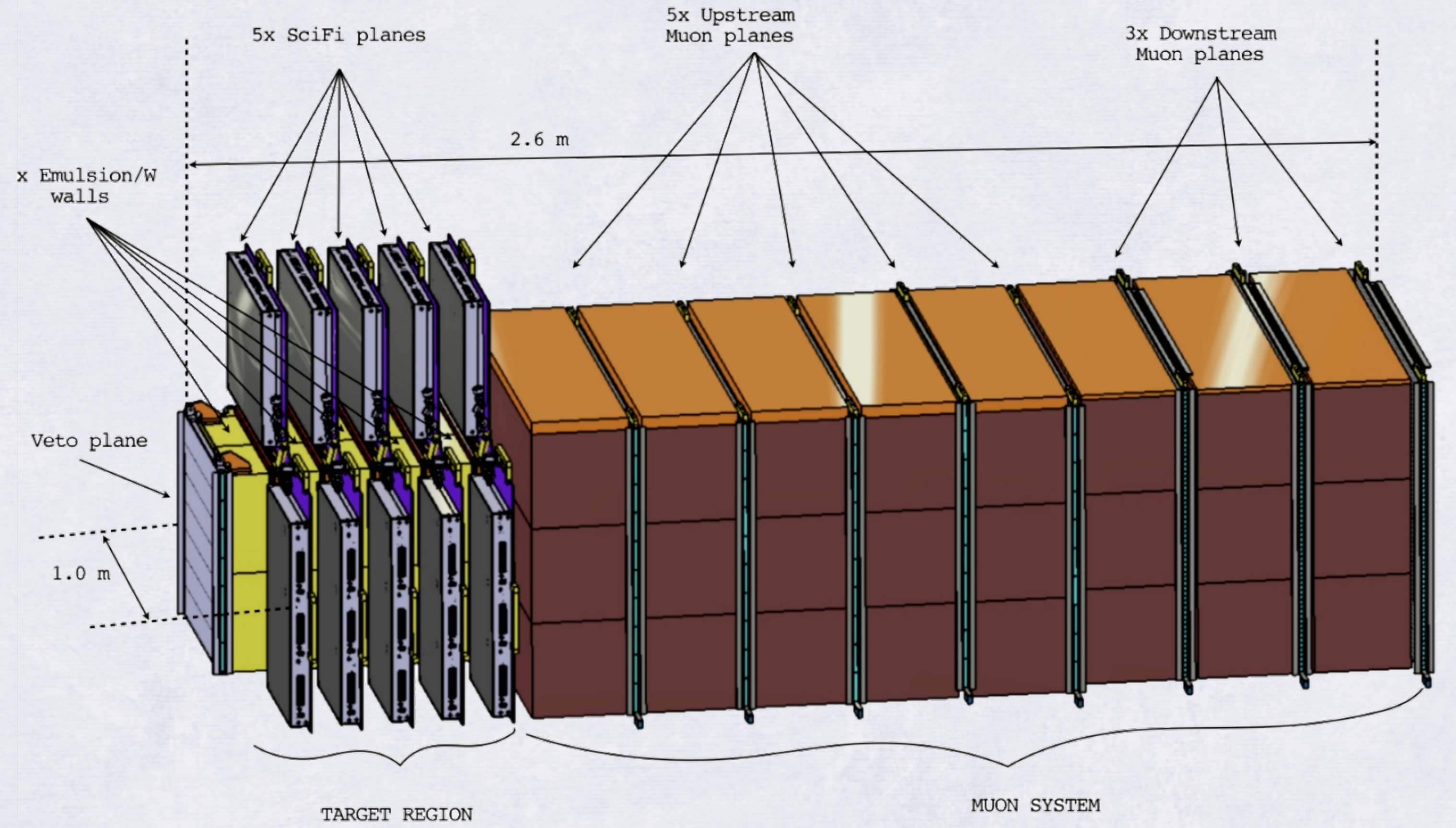


SCATTERING NEUTRINO DETECTOR

Goal / Measure ν and anti- ν production from proton proton collision for all the flavors and in an energy range not yet explored.

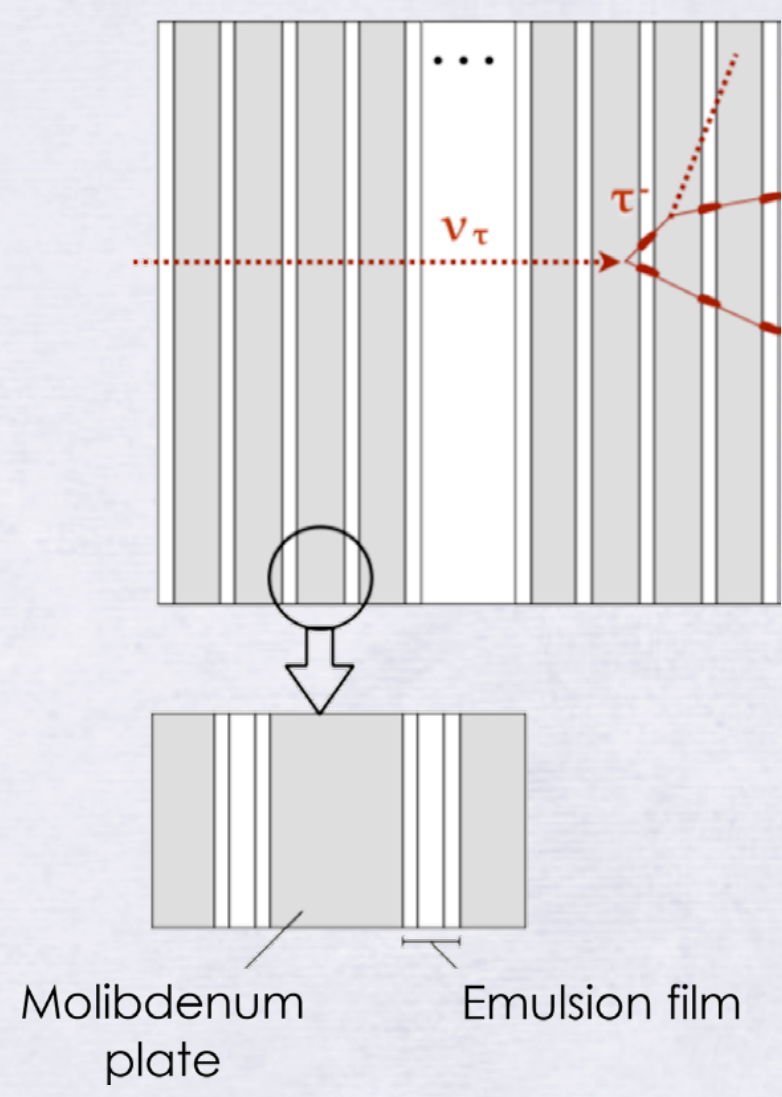
Design / Hybrid detector optimised for the identification of 3 neutrino flavours and for the detection of feebly interacting particles

- **VETO PLANES:** tag penetrating muons
- **TARGET REGION (830Kg):**
 - Emulsion cloud chamber ECC (emulsion+tungsten) for neutrino interaction detection
 - Scintillating fiber SciFi for timing information and energy measurement (em. cal)
- **MUON SYSTEM:** iron walls interleaved with plastic scintillator planes for fast time resolution and energy measurement (hadr. cal)



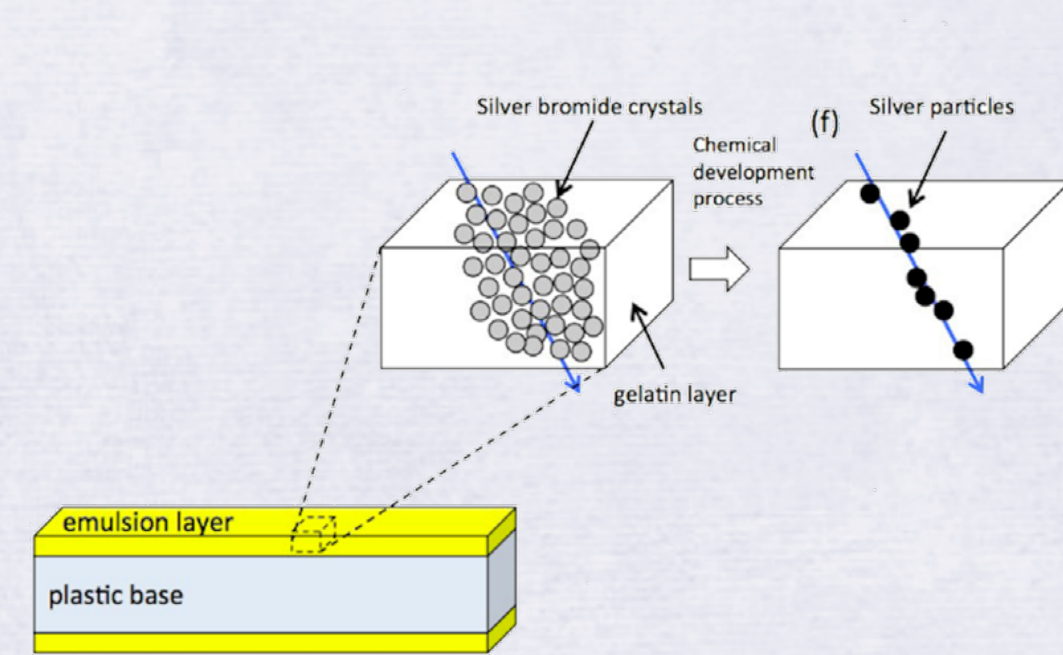
NUCLEAR EMULSION TARGET

TARGET INSTRUMENTATION



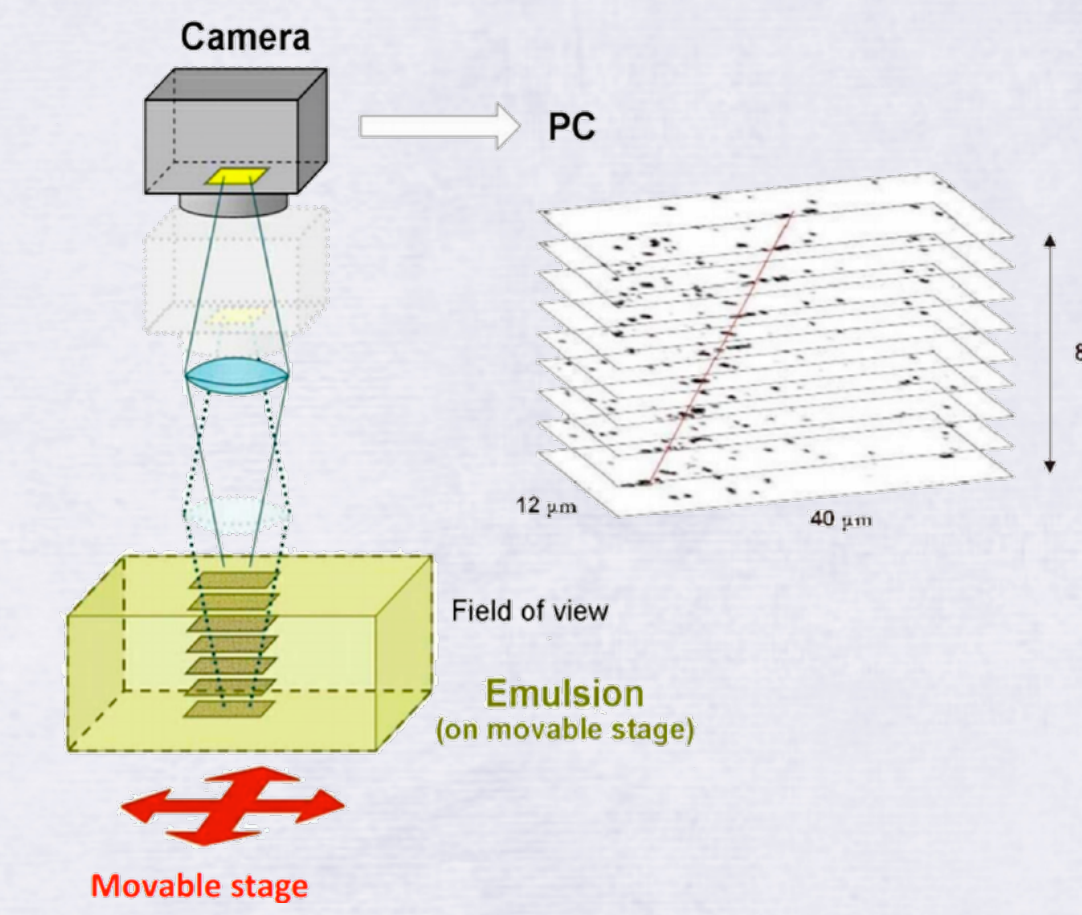
- Emulsion Cloud Chamber (ECC) technique employed;
- Passive material for neutrino interactions;
- Nuclear emulsions used as tracking devices to identify neutrino interactions.

NUCLEAR EMULSIONS



- 3D tracking detectors made of AgBr;
- Resolution of the order of $1\mu\text{m}$ or less in position and of 3 mrad in angle;
- After development silver clusters are visible to optical microscope.

THE SCANNING SYSTEM



- Emulsions scanning performed by means of a fully automated optical microscope;
- 3D Sequences of aligned clusters (grains) are recognized and used to reconstruct Tracks.

MUON SYSTEM

Design:

- Each layer consists of scintillating bars;
- Bars r/o on each bar end by SiPMs.

Data acquisition:

- For each side the signals are converted into data;
- Data are synchronized and stored in a database.

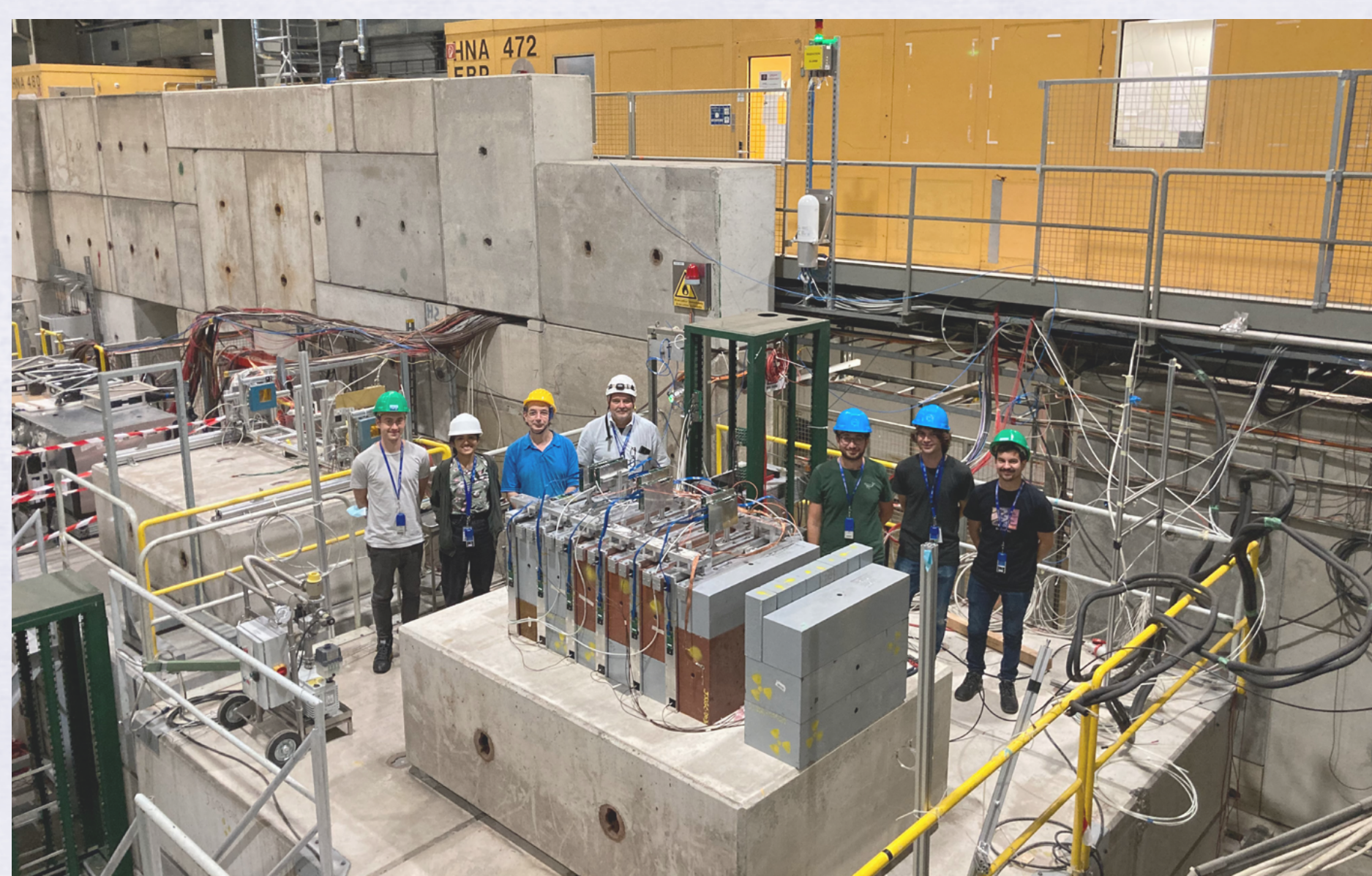
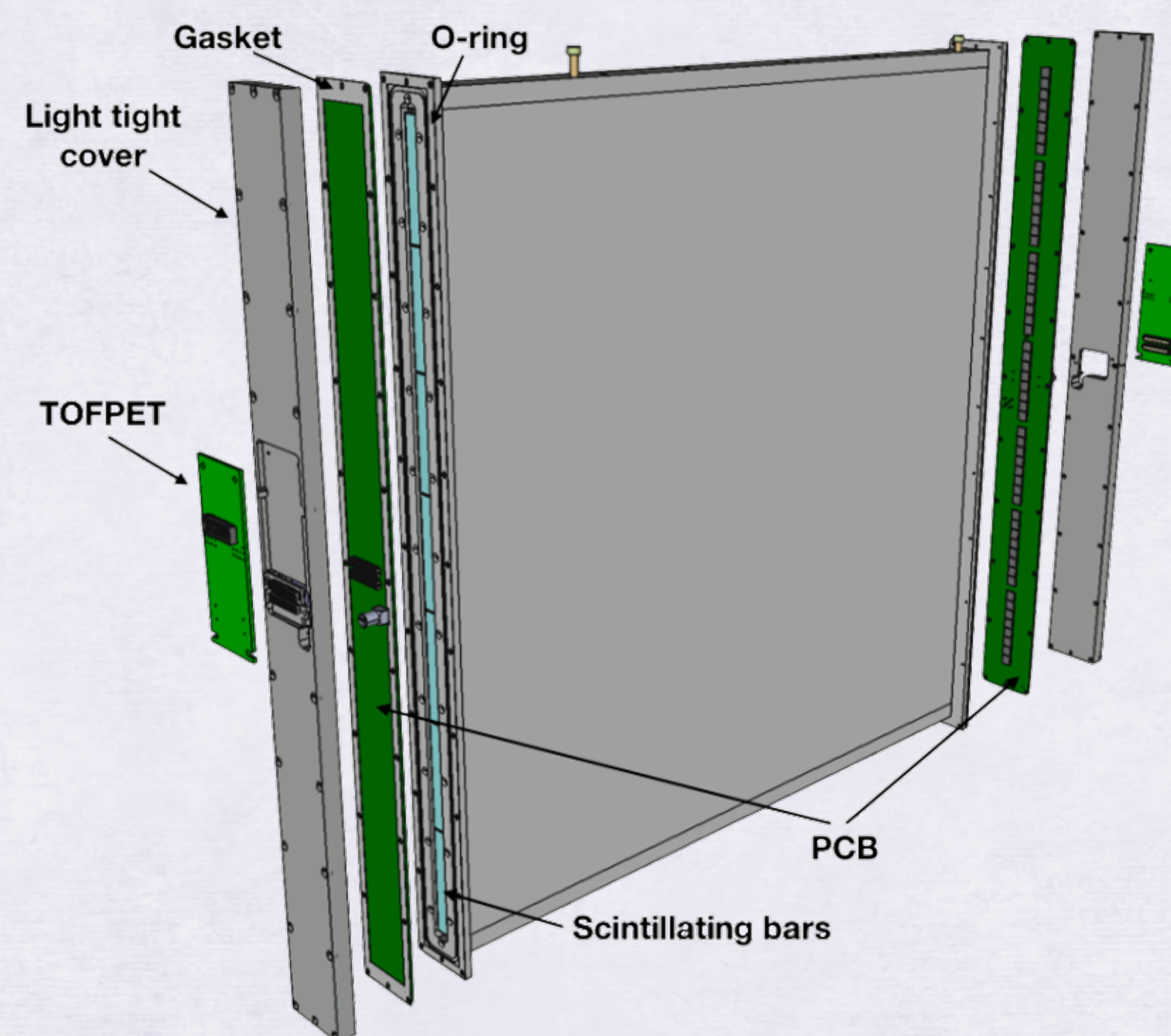
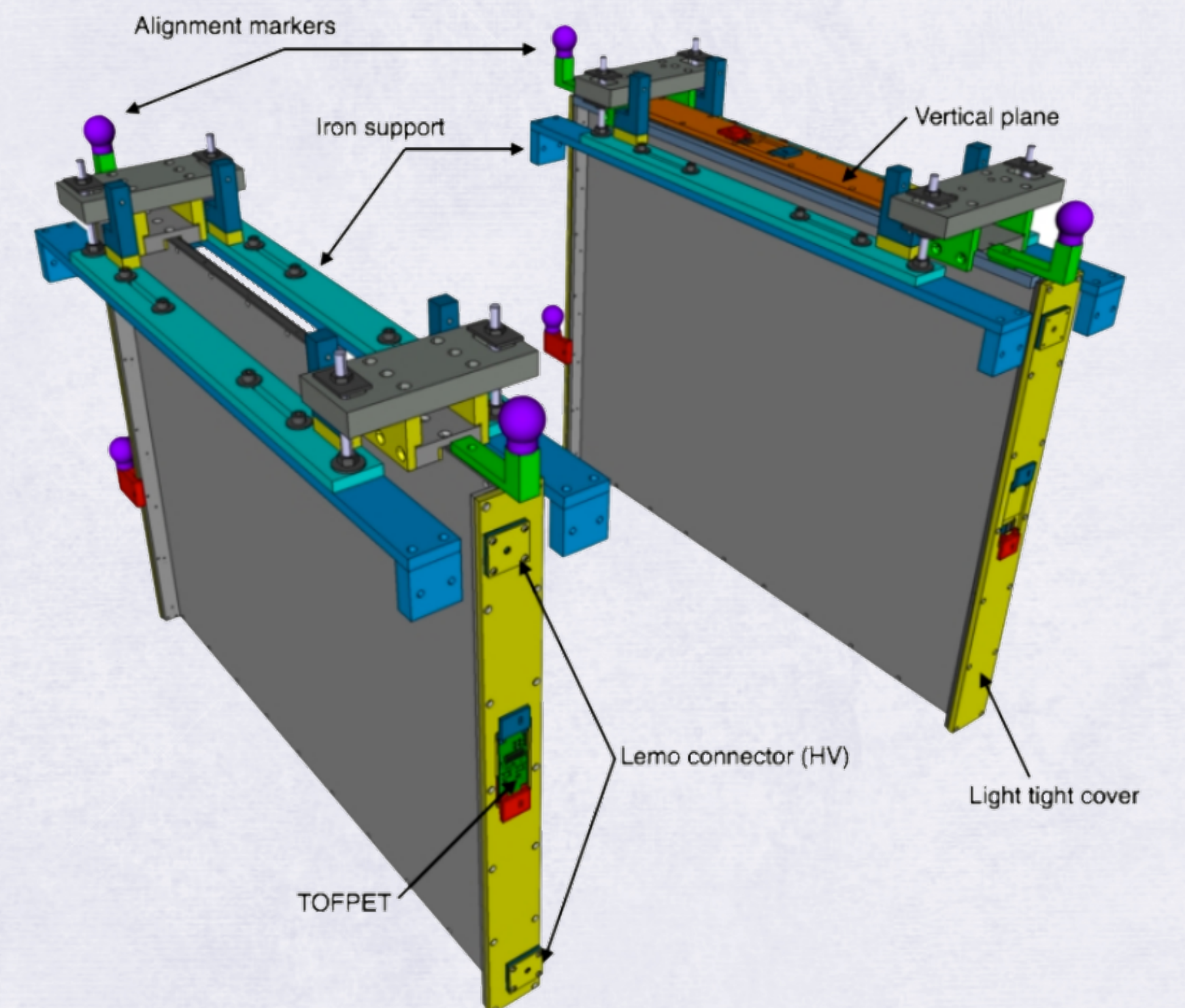


Photo taken during the Test Beam in H8 at CERN, October 2021.



VETO layer components.

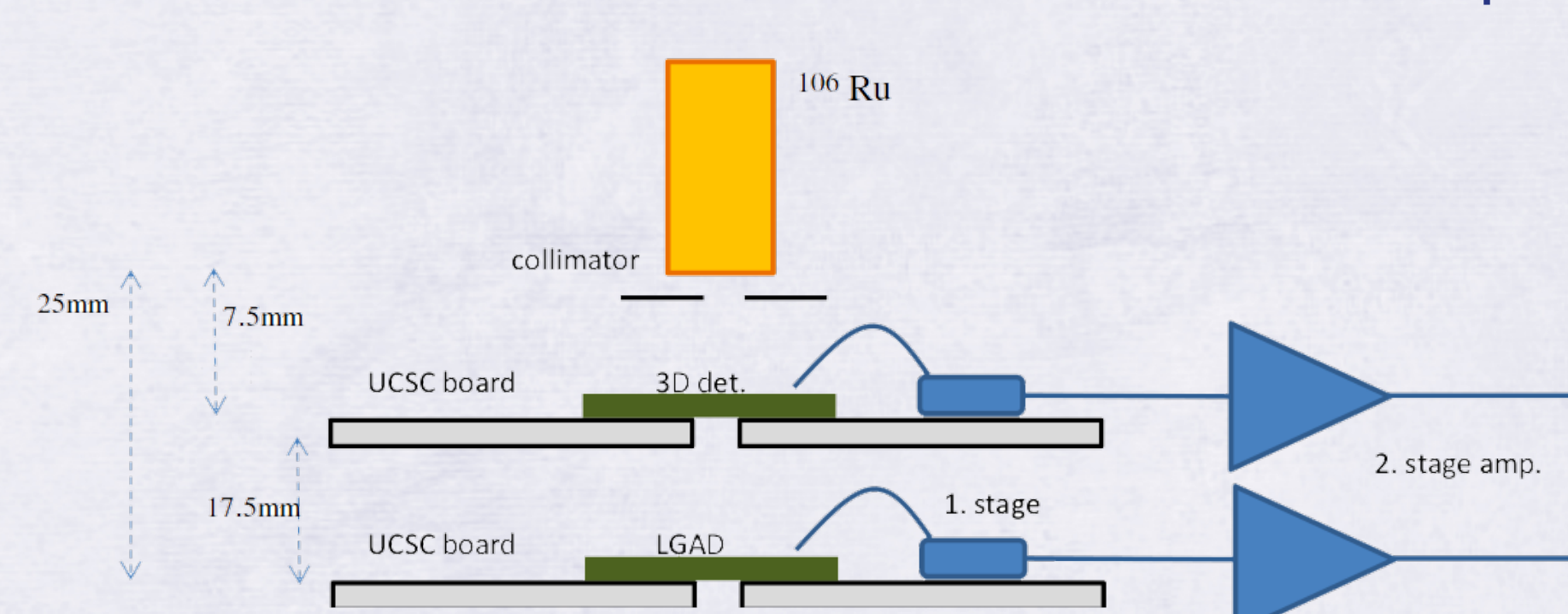


Muon upstream (left) and downstream (right) layers.

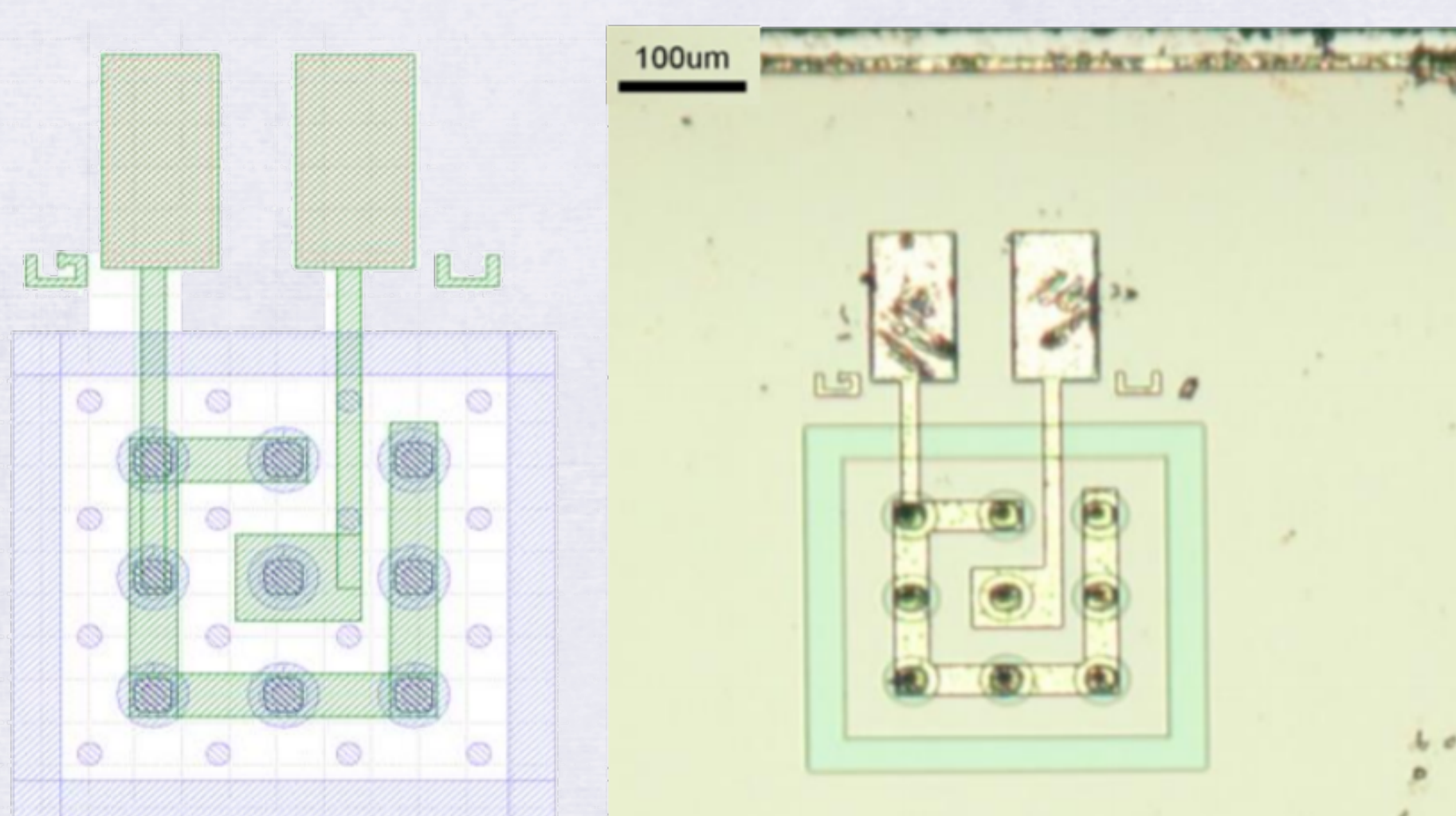
3D SILICON PIXEL DETECTORS

Ideal candidates for the innermost layers of vertex trackers. High radiation hardness and time resolutions of the order of tens of picoseconds.

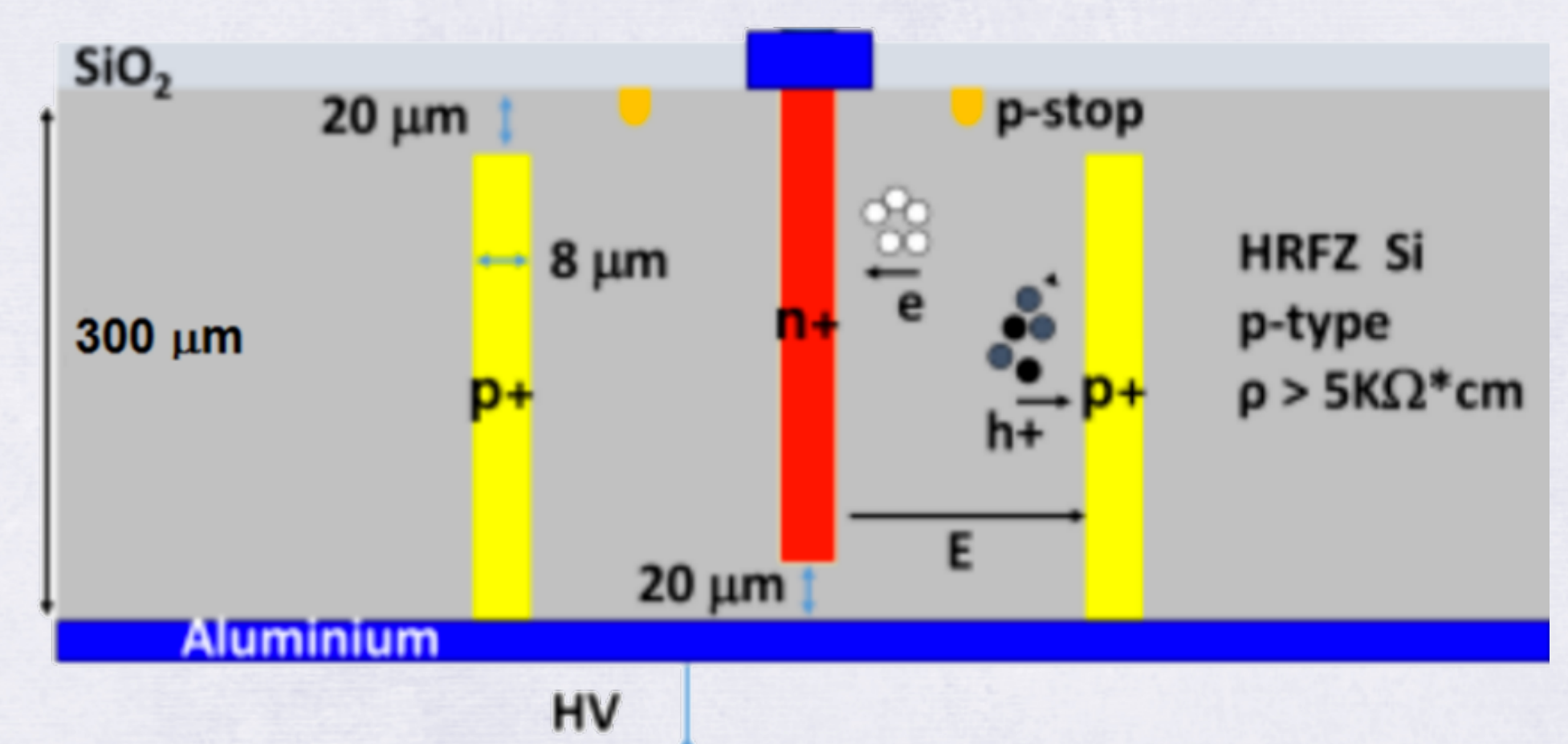
Column-shaped electrodes, allowing the distance between electrodes and sensitive detector thickness to be decoupled.



Experimental setup .



Schematic view from top.



Cross-section of a single cell structure.