Penetrating Particle Analyzer

Horizon 2020
European Union Funding
for Research & Innovation

PAN Beamtest. H4 Beam Line

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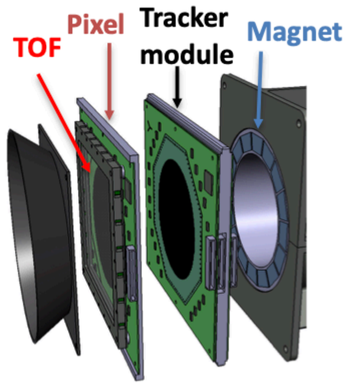
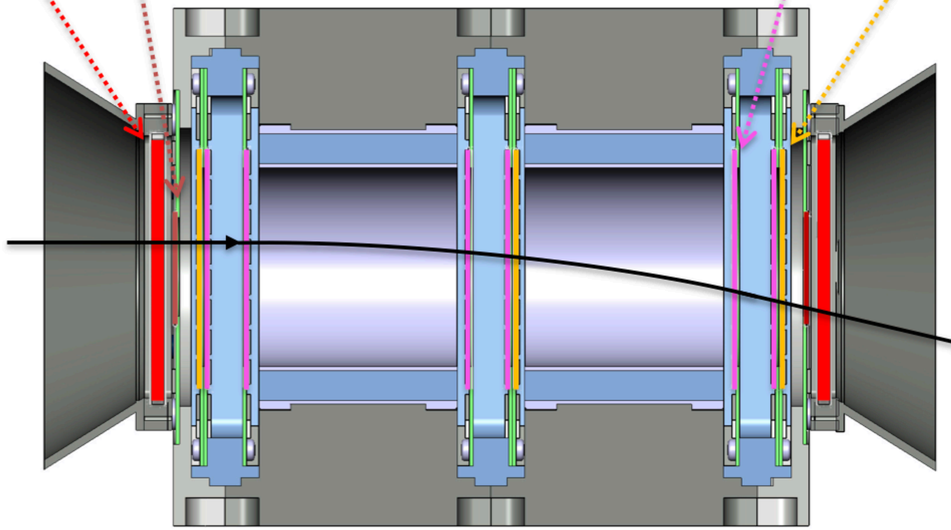
30.03.2022

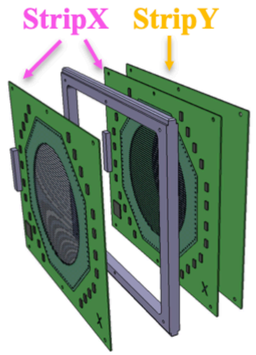
Penetrating Particle Analyzer

PAN: versatile integrated instrument concept

- Excellent rigidity resolution thanks to fine pitch thin (StripX, StripY) silicon detectors
- In addition: TOF, PIXEL

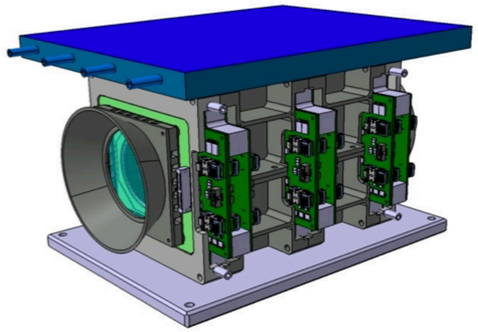






~50 MeV - 1 GeV energy range

- TOF: Plastic scintillator with SiPM readout
  - Provide a trigger
  - Measure Z
  - Measure Time of Flight
  - Provide a low energy particle counter



StripY: measure the particle direction in Y with an angular resolution ~0.2°
- Also provide trigger
- Measure Z (both Strip-X and Strip-Y)

- PIXEL: 3-d points with 55 µm Si pixels
  - **No measurement degradation even during the most intense solar storms**
  - **Provide a high rate particle counter**
  - Improve tracking (a fraction of events)
  - Measure Z (a fraction of events)
  - Only partial coverage for power saving

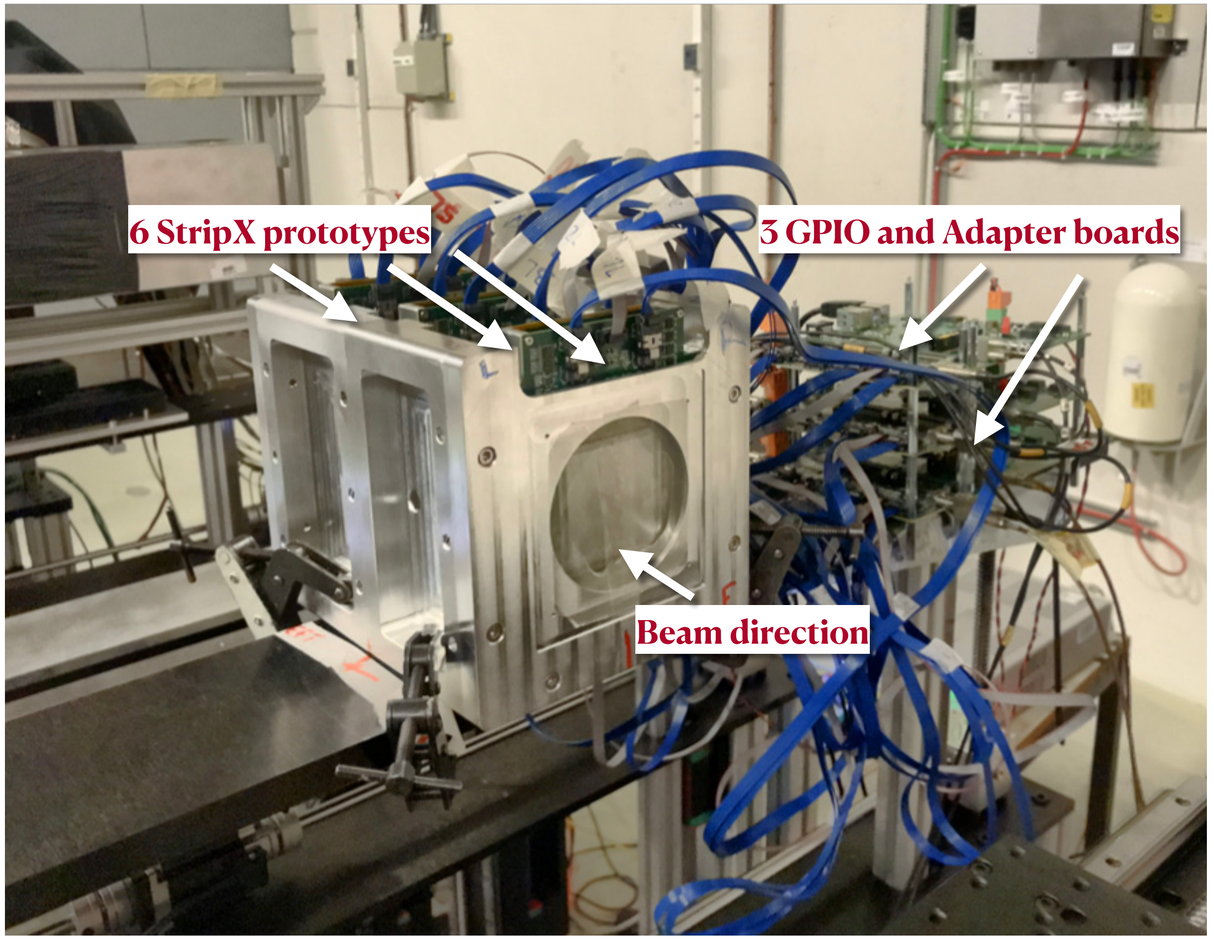
All the goodies for just <10 kg, < 30 W, 30 × 20 × 20 cm³ !!!

Penetrating Particle Analyzer

PAN Beamtest in November 2021

T9 beam line (CERN, East Area)

- **Objectives**:
  - Test the performance of **6 StripX** prototypes
  - Test the DAQ capability to readout **6 StripX** boards
  - Perform runs with/without magnets installed
  - Beam: **10 GeV/c**, π^-, ~1x1 cm FWHM



StripX detectors inside the experimental area of T9 beam line.

Penetrating Particle Analyzer

PAN Beamtest at CERN, North Area 2022

H4 Beam line

- 1 **beamtest** campaign scheduled:
  - 12 days, week 48-49 (Nov-Dec) at H4
- Our plans:
  - Add **Pixel, ToF** and **StripY** sensors
  - Perform runs with/without magnets installed
  - Perform position/momentum resolution studies
  - Test new Ethernet readout

- Our beam and exp. area **needs**:
  - Ion fragments from **Z = 2** to as high as possible, as low energy per Z as possible. “Wide” beam **~1x1 cm FWHM** or more.
  - A **beam trigger** signal (preferably from detectors as close as possible to the exp. area or inside). **Up to 1 kHz** trigger rate.
  - Beam timing signals if possible
  - A **vertically adjustable** table (a DESY table or any equivalent one)
  - A regular table for PCs, power supplies and other equipment inside the area
  - Access to power plugs, CERN network inside the area
  - A few workplaces in the control room