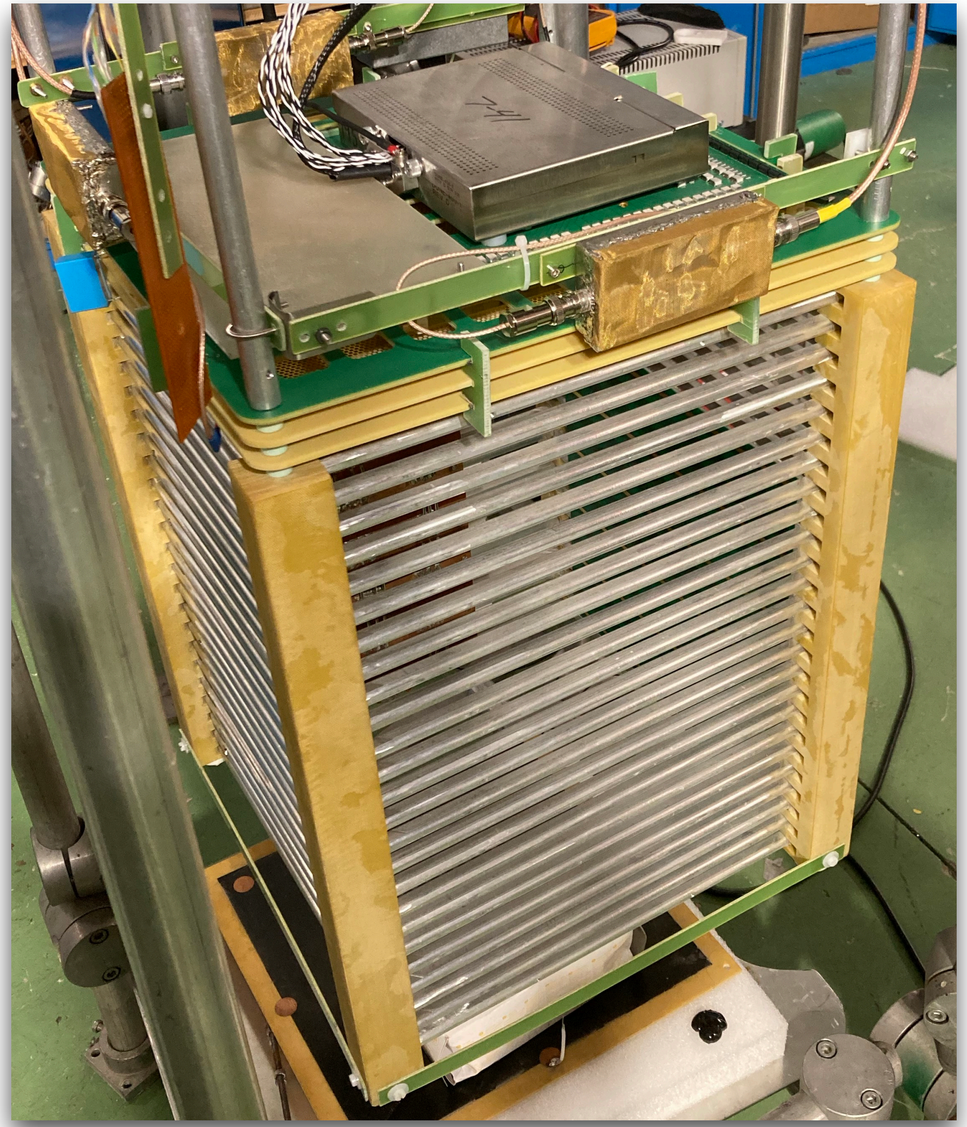
Bi-207 short update



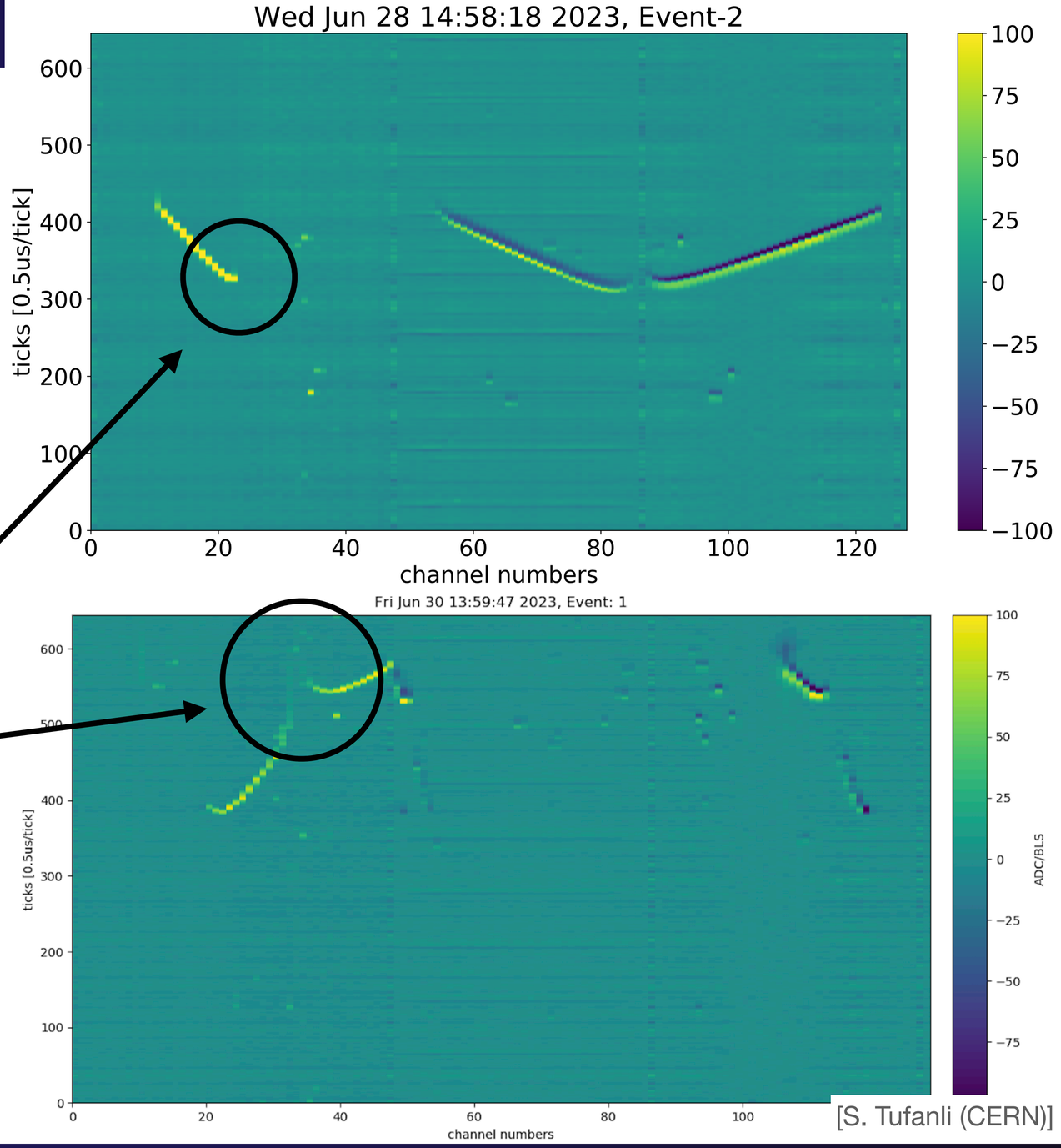
Mattia Fanì
Los Alamos National Laboratory

Update

- The 50-liter prototype was prepared for a number of measurements
  - Dual source configuration (long drift, short drift)
  - Transparency scan as a function of the voltage bias of the CRP (anode)
  - E-field uniformity tests in presence of insulating plates installed on the FC
  - Integration of meshed ground plates into the bottom CRP composite structure
- New data taking started in June 2023**:**
  - Two 37-kHz sources installed (vs 3kHz single source we had previously):
  - G10 insulating plate on the FC to study the field distortion inside the active volume (R&D for DUNE-FD3)
  - Data acquired for 12 days, from June 22nd, random + external pads trigger for cosmic muons at O(1 Hz)

Findings:

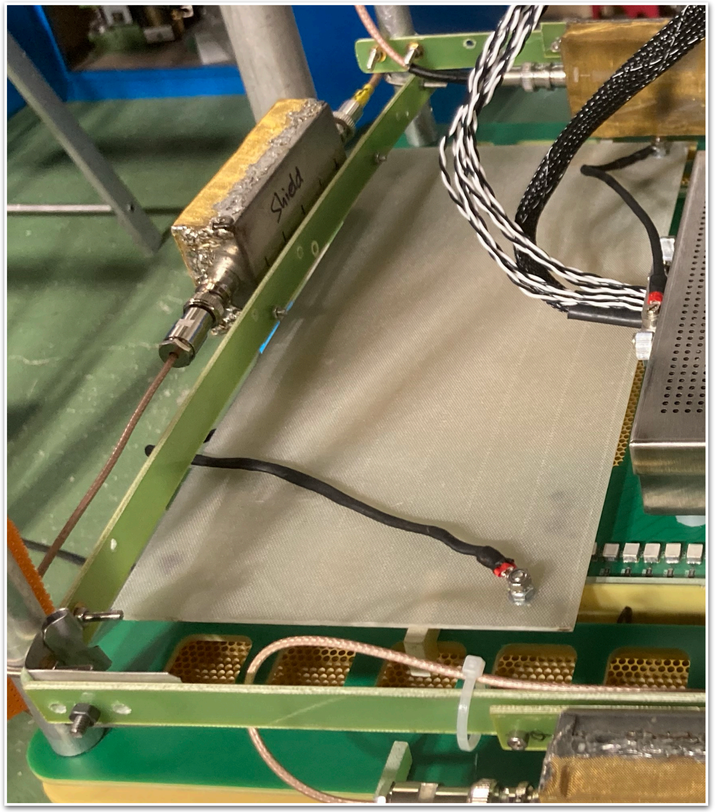
- Some noise was periodically appearing
- Two kinds of track distortions
  - Bias voltage mismatch btw the last FC profile and shield plane on the anode
  - Field distortion in the region of the source holder, **expected**
- Sources are visible
  - Analysis is ongoing

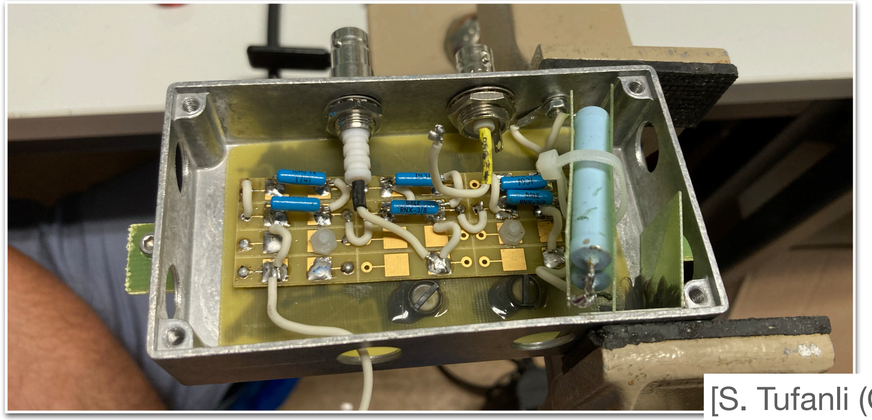


[S. Tufanli (CERN)]

Next data acquisition preps

- Study the integration of a metallic mesh into the composite frame for bottom CRP common ground (R&D DUNE-FD2)
  - Electrical noise improvement
  - Study on possible effects on signal
- Additional step for FC divider circuit added to exactly match the voltage gradient btw the last stage of the the FC and the shield plane on the anode. Tunable from outside, same as in ProtoDUNE
- Plan is to close the detector today. Data acquisition to resume shortly
- Data acquisition is now synced w/ shared storage space.
  - All controls and analyses are now available to all users and possible from remote

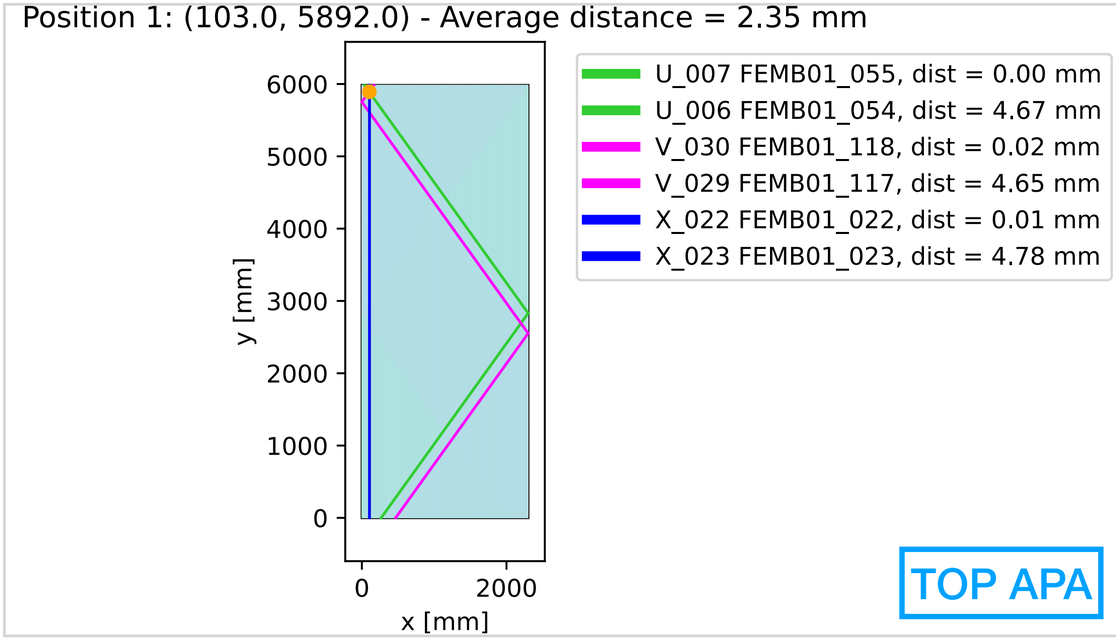


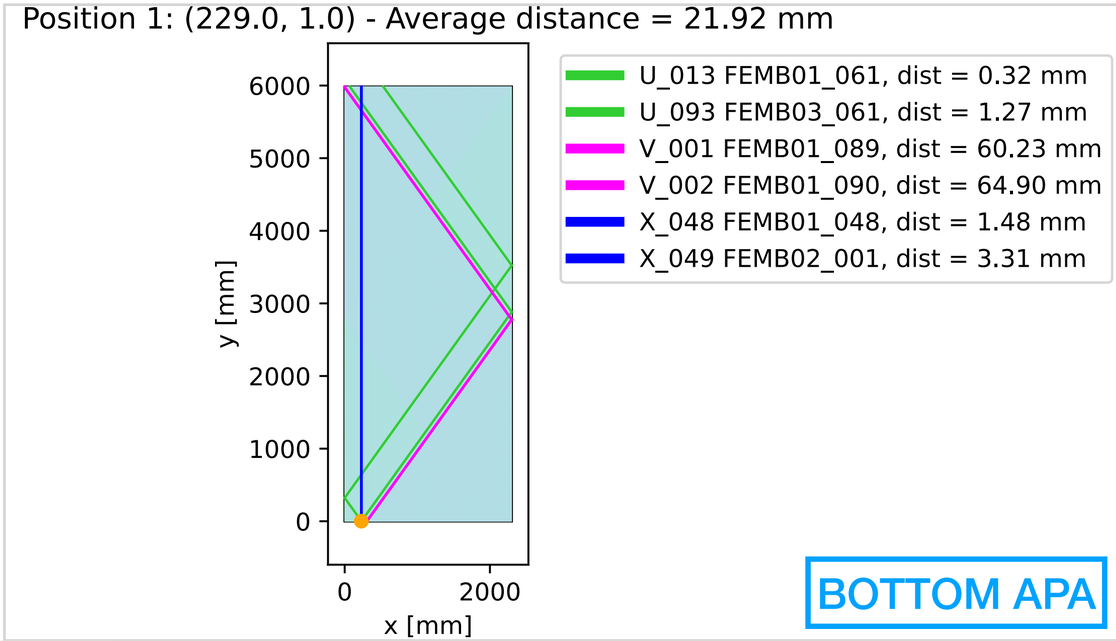


[S. Tufanli (CERN)]

APA study

- A tool was finalized and made available on the repository
- The study on the selection of viable positions for ProtoDUNE-II calibration is completed
- Need to define validation criteria with the DAQ consortium





Remarks

- Data taking 2023 is ongoing; measurements expected to resume tomorrow
- Updates are in place to tackle some remaining electrical noise and E-field distortion
- Data are now synced in the CERN systems and available for offline and remote use.
- A shared data analysis framework is available on a CERN repository
- Data from 2023 campaign acquired so far are all good for CALCI scope and are currently being used for analysis. Results to be released in a next meeting
  - Dual source configuration (long drift, short drift)
  - E-field uniformity tests in presence of insulating plates installed on the FC
- New members have joined the group:
  - Luke Saunders, BSc, Physics (CERN and Boston University): Feb-Aug 2023
  - Feraol Ibrahim, BSc, Microengineer (CERN and Ecole Polytechnique Fédérale de Lausanne): Jul-Aug 2023
  - Lucas Boistray, BSc, Physics and Computer Science (CERN and Sorbonne Université): Jul-Aug 2023