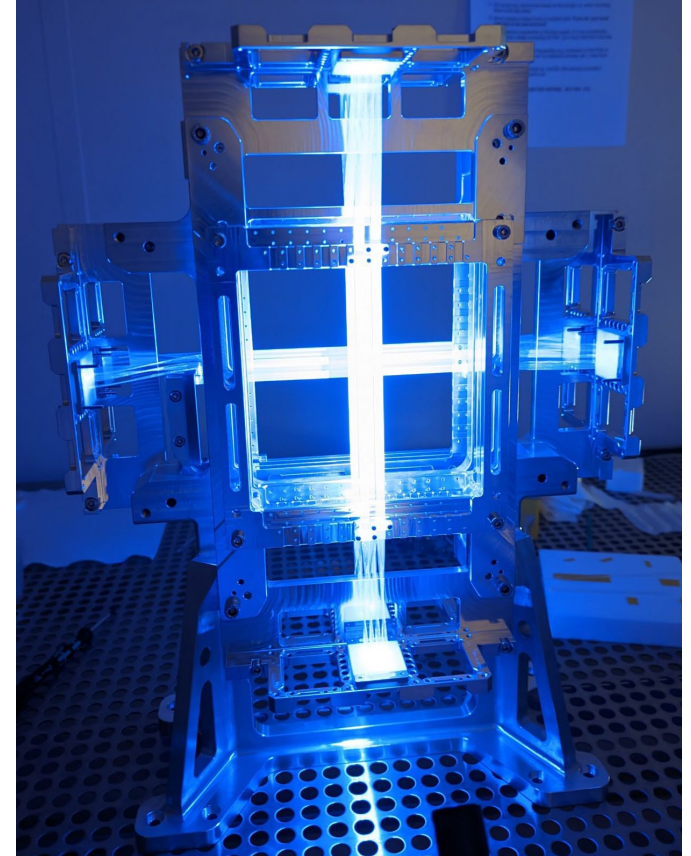


SFH – Beam Test 2022

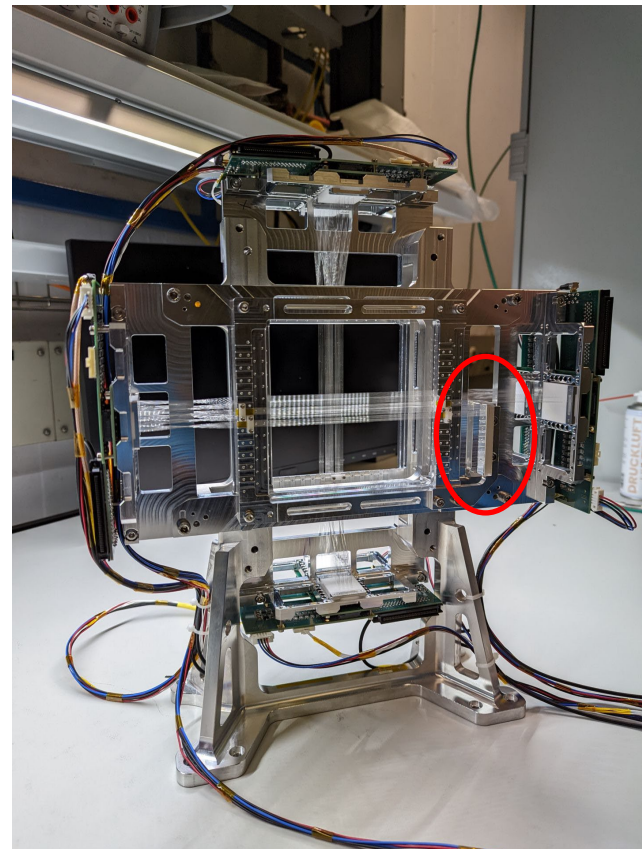
COMPASS – AMBER Technical Board
December 6th, 2022



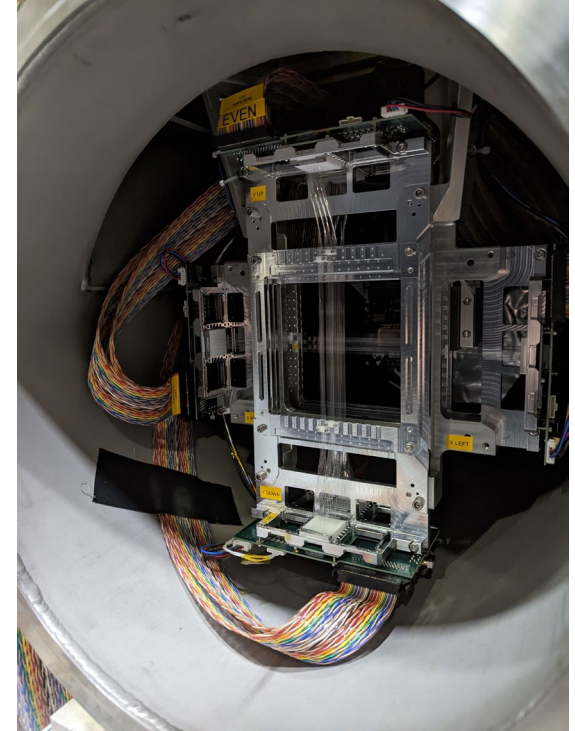
SFH Prototype

Goal: Investigate detector properties

- Detector prototype covering central beam area
 - 32 fibers per plane
 - 2 X-planes & 2 Y-planes, second plane shifted by half a fiber to increase detector acceptance
- Read out with MSADC modules from ECAL0 to record full spectral response (vs. CITIROC's discriminator & iFTDC)
- Upper half of Y-planes equipped with **mirror**, double sided readout for the remaining fibers
- No cooling, SiPM temperature $\sim 40^{\circ}\text{C}$



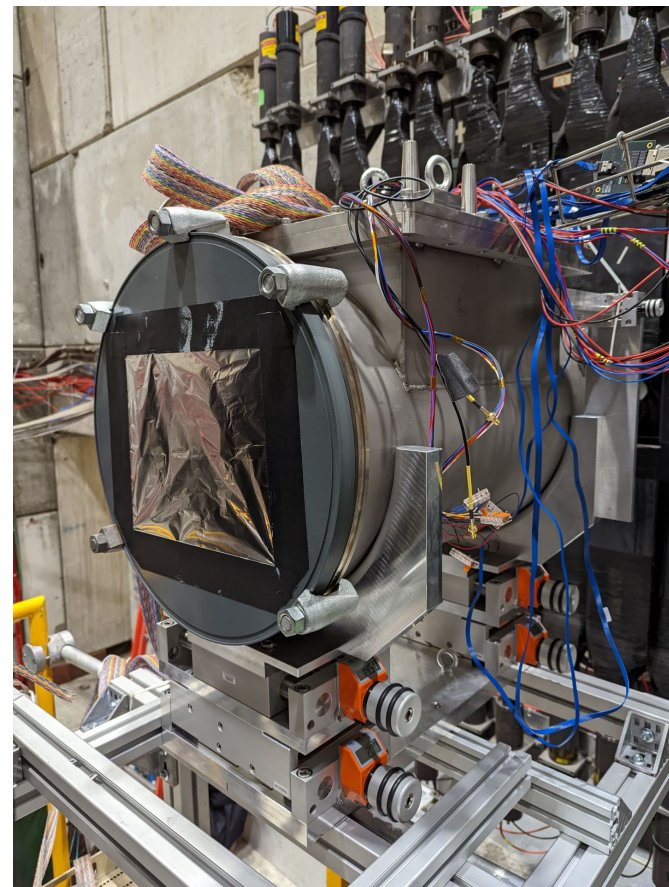
Installation During MD



Successful installation into UTS vessel and cabling during MD on 09.11.

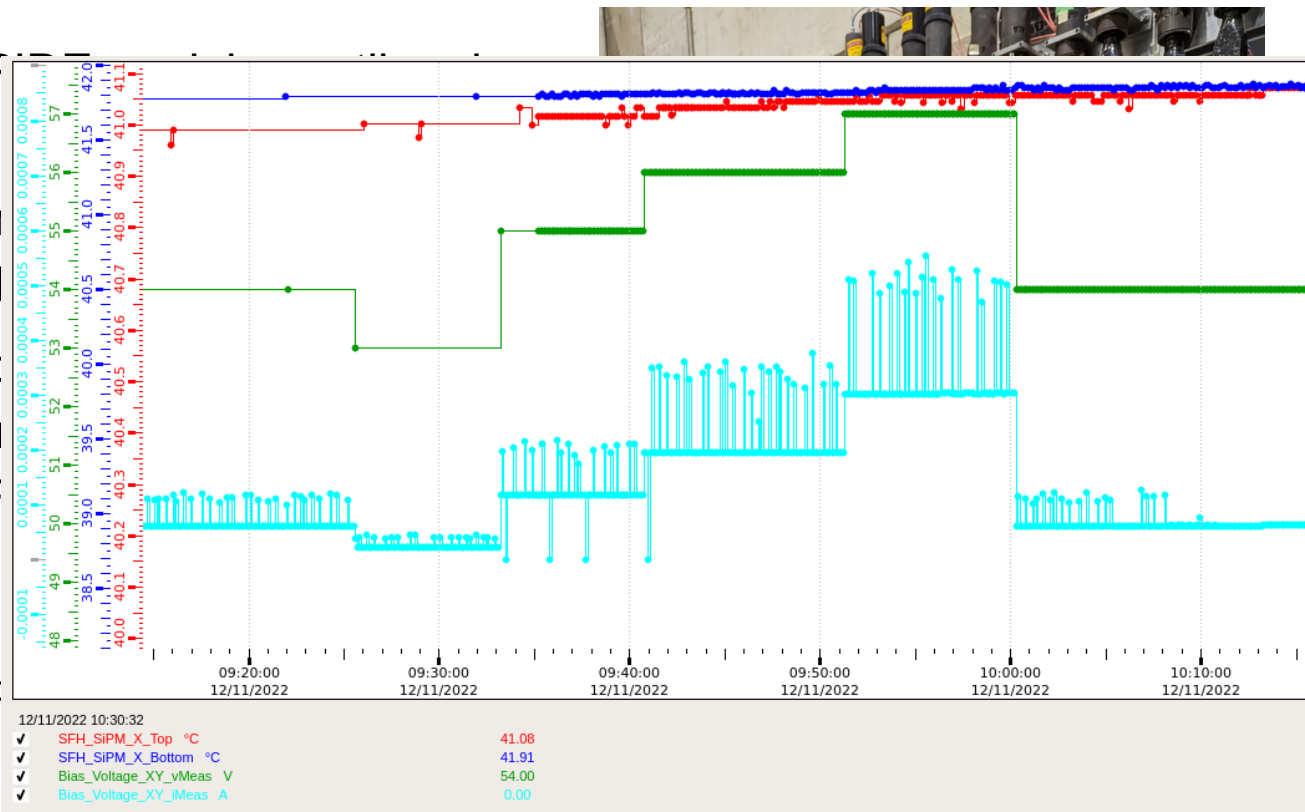
UTS – Data Taking

- Operation with ALPIDE modules until end of beam (14.11.)
- Parasitic data taking during low-intensity hadron beam for pbar test run
- ~1h dedicated muon beam (160 GeV/c) for combined data taking and SFH bias scan
- Removal on 14.11.
 - SFH is back in Munich for further testing
 - UTS vessel and positioning system stay at CERN



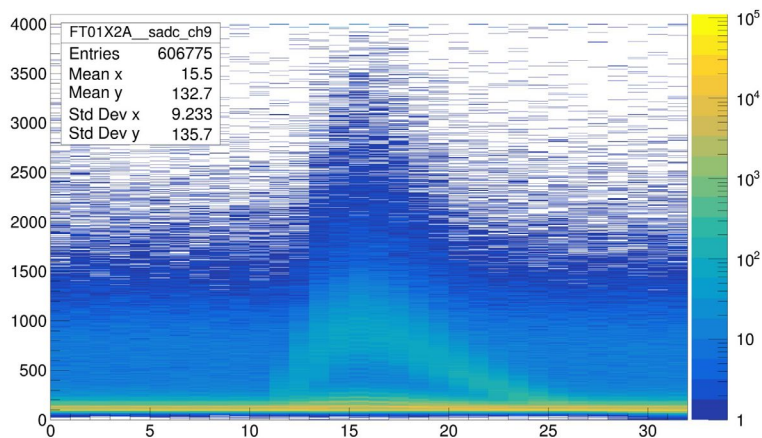
UTS – Data Taking

- Operation with ALF of beam (14.11.)
- Parasitic data taking hadron beam for pl
- ~1h dedicated muon (160 GeV/c) for coll data taking and SF
- Removal on 14.11.
 - SFH is back in Mu
 - UTS vessel and p at CERN

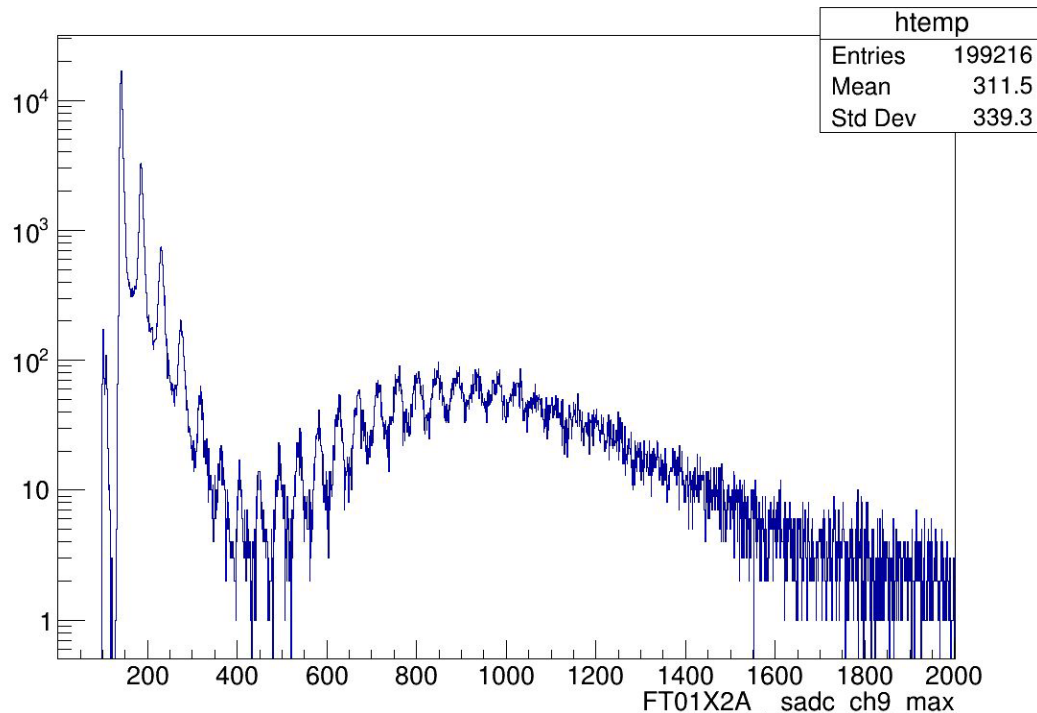


Example of Signal Spectrum (Time Cut)

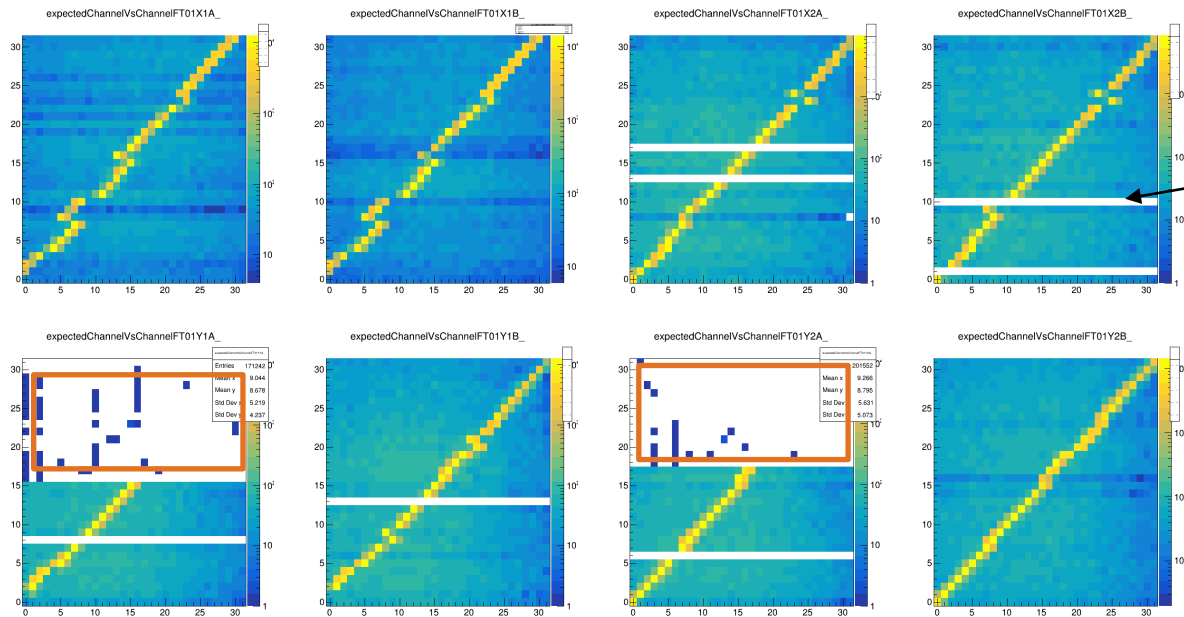
FT01X2A__SADC Samples for channel 9



FT01X2A__sadc_ch9_max {FT01X2A__sadc_ch9_maxSample > 12 && FT01X2A__sadc_ch9_maxSample < 18}



Preliminary Alignment



6 dead channels
(read-out electronics)

Mirror, one-sided
readout only

First channel matching / alignment
(ongoing work)

First Reconstructed Tracks



Ongoing Work and Next Steps

Analysis

- Finalize alignment / channel matching
- Investigation of light-yield variations within different fibers
- Coincidence for double-sided readout, performance comparison with mirrored fibers
- Calculation of detector efficiencies and purity as a function of threshold (# of SiPM cells)
- Matching with ALPIDES

Hardware

- Front-end electronics with CITIROC and ifTDC
- Cooling system
 - Parasitic tests in first half of 2023