HiDRa - test beam 2024

**Iacopo Vivarelli - RD_FCC Bo - all results are EARLY DAYS - do not use for public talks**

Test beam 2024

- A prototype made of 36 HiDRa modules was put on beam during August/September 2024.

  - Each module is 2.8 x 12 x 250 cm^3 and is wad out by 2 PMTs (one for the Cherenkov and one for the scintillation readout)

- In HiDRa the central tower will be read by SiPM for ~ mm scale lateral granularity.

- Scope of the testbeam:

  - Characterisation of prototype with electrons

  - First checks with hadrons.
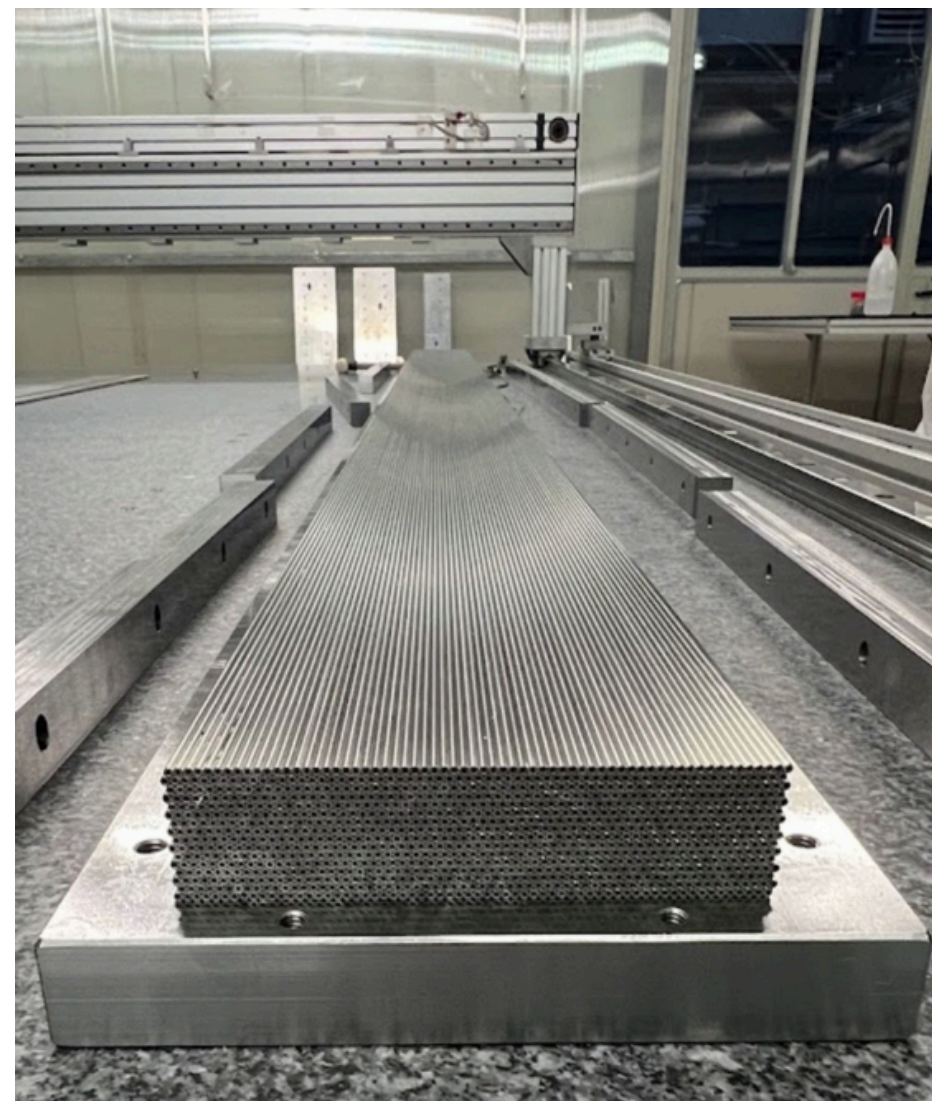
| TS55	TC55	TS54	TC54	TS53	TC53
TS45	TC45	TS44	TC44	TS43	TC43
TS35	TC35	TS34	TC34	TS33	TC33
TS25	TC25	TS24	TC24	TS23	TC23
TS16	TC16	TS15	TC15	TS14	TC14
TS17	TC17	TS00	TC00	TS13	TC13
TS10	TC10	TS11	TC11	TS12	TC12
TS20	TC20	TS21	TC21	TS22	TC22
TS30	TC30	TS31	TC31	TS32	TC32
TS40	TC40	TS41	TC41	TS42	TC42
TS50	TC50	TS51	TC51	TS52	TC52
TS60	TC60	TS61	TC61	TS62	TC62

Setup and runs

- Similar setup as previous test beams.

  - But we had a layer of silicon (AtlasPix, operated by colleagues from Statale Milano).

- Summary of runs taken:

  - Equalisation runs with electrons

  - Electron energy scan.

  - Electrons at 90° to study fibre attenuation length

- Pion energy scan.

- Muons (wide energy beam)
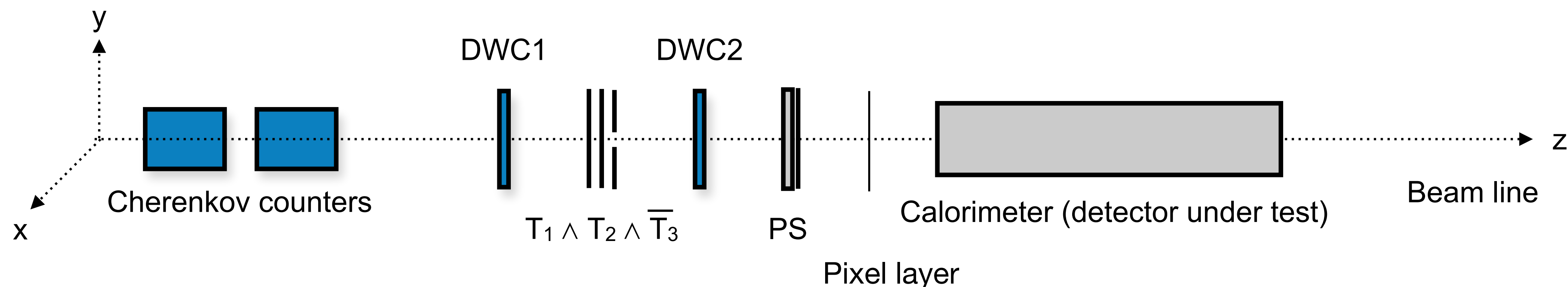
Some first results - pedestal stability

- Different colours are different runs. Full marker is scintillation, empty marker is Cherenkov.

- No significant shift within a run or between different runs
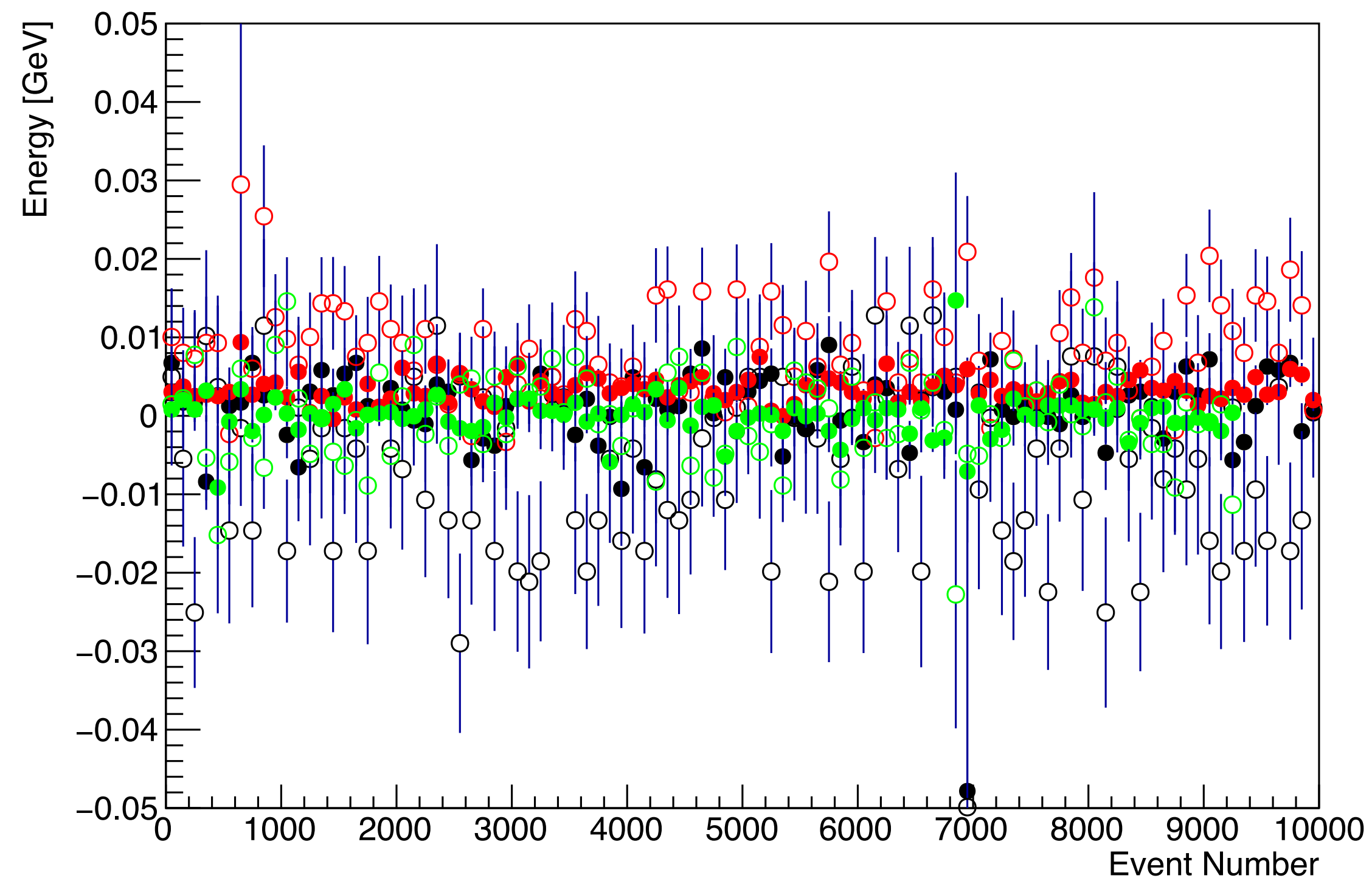
Fibre attenuation length

- Used runs where we fired at 90^0 on the prototype to estimate fibre attenuation length

  - Previous measurements in the lab (before insertion in capillary tubes) estimated ~ 7 m for Cherenkov and ~20 m for scintillation.

  - Result well below expectation. A coincidence that the same result is obtained for completely different finer sets?

Attenuation Lengths:
$\lambda_S = 3656.13$
$\lambda_C = 3731.09$
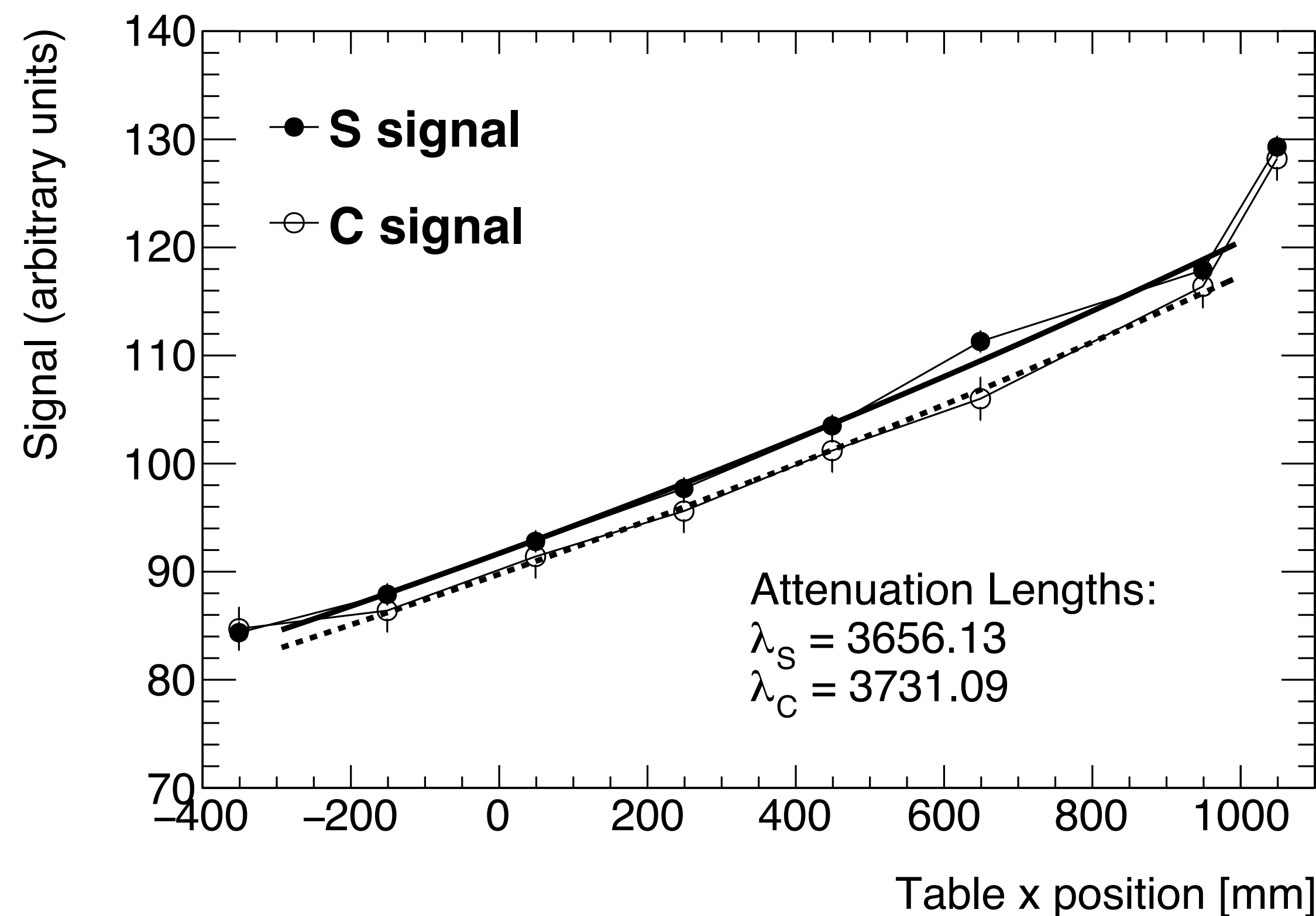
Summary

- TB2024 took place exposing a subset of HiDRa modules (read out with PMTs rather than with SiPM).

- Plenty of data to analyse (but also lots of hiccups during the test beam).

- First results on fibre attenuation lengths need understanding.