

Overview of the 2024 beam test: exciting new data and analysis opportunities

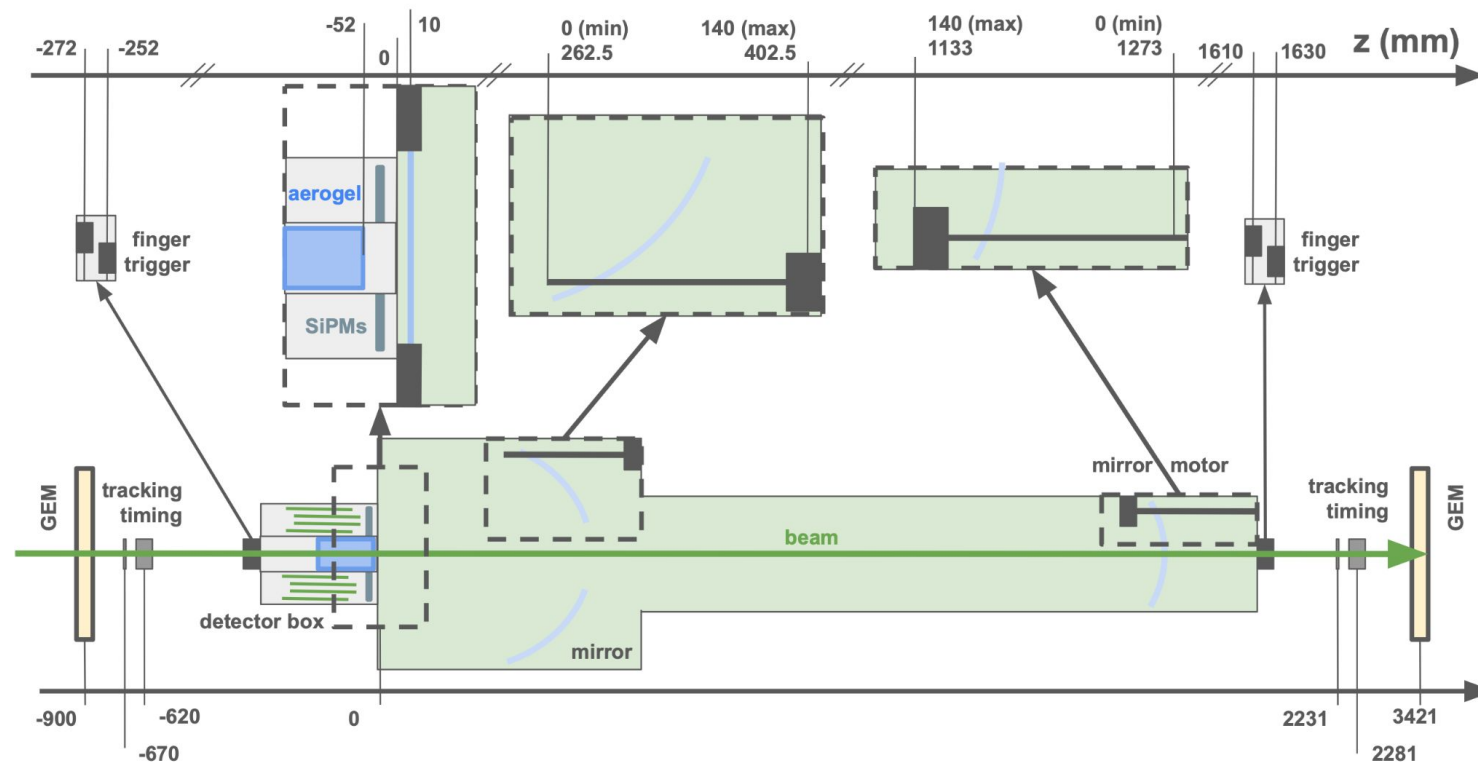
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(1) INFN Bologna
21 June 2024

Prep. of the 2024 beam test



Experimental set-up

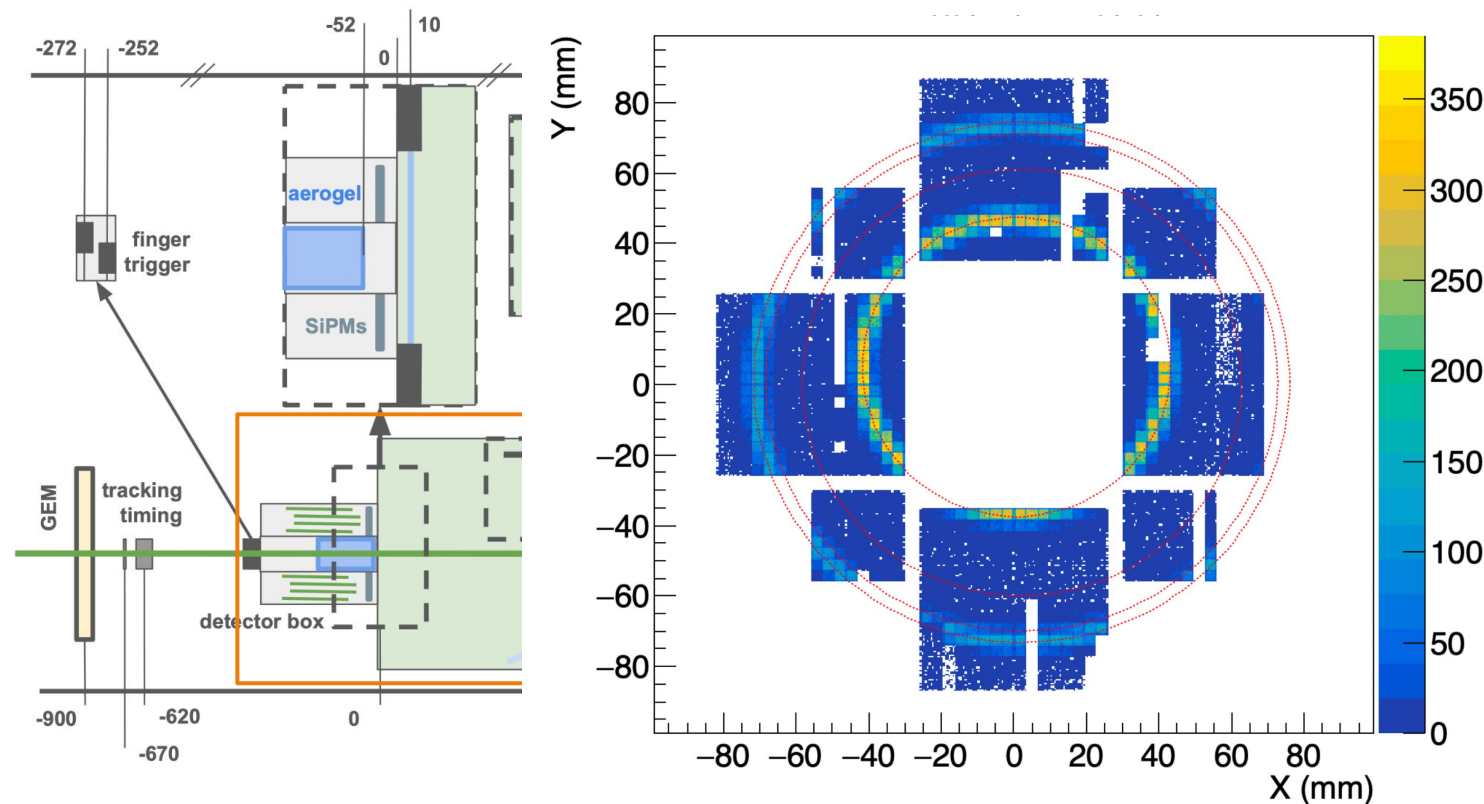


Experimental set-up

SAME

Acquired the project CAD to provide precise distances in the barrel

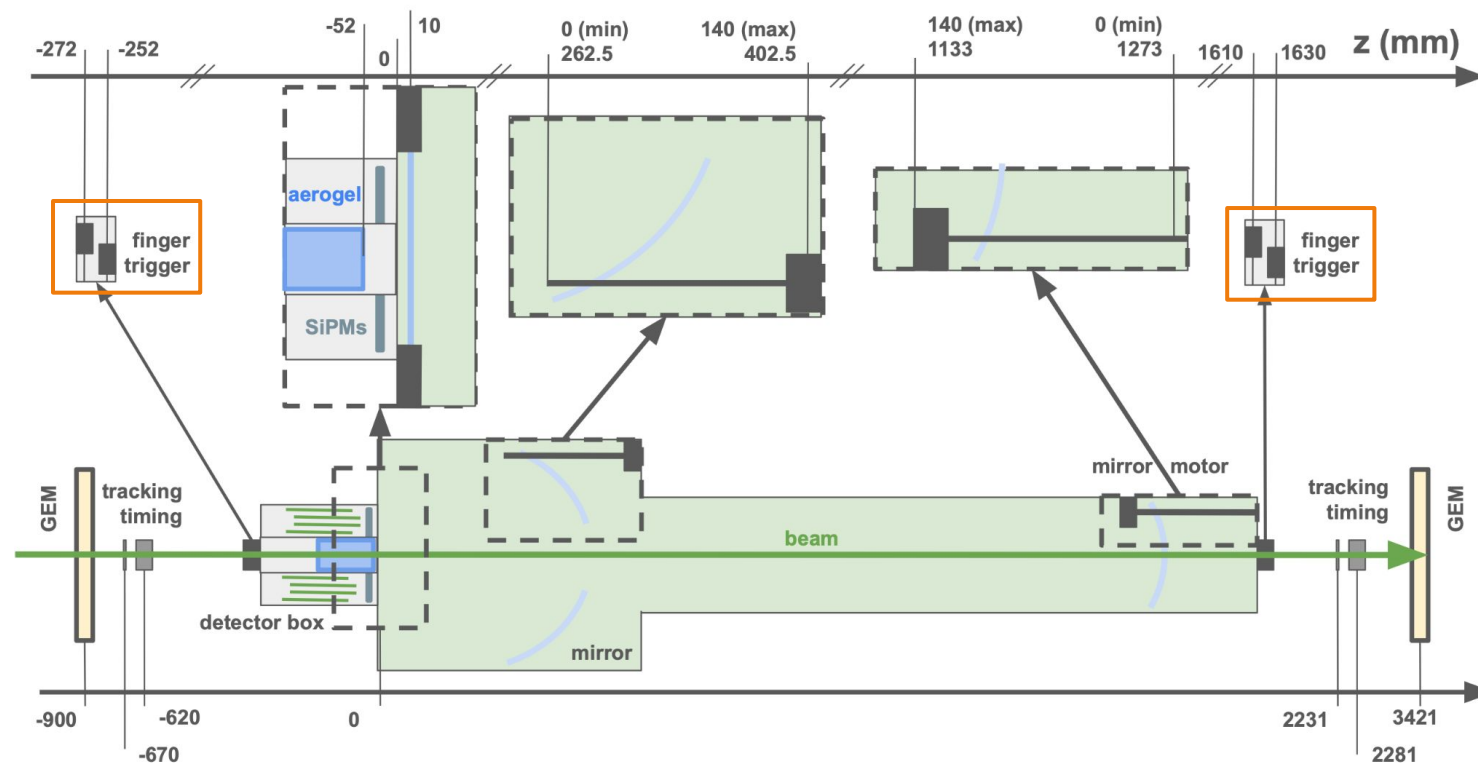
now accurate theoretical prediction for radius
(a few problems with gas, still)



Experimental set-up

SAME

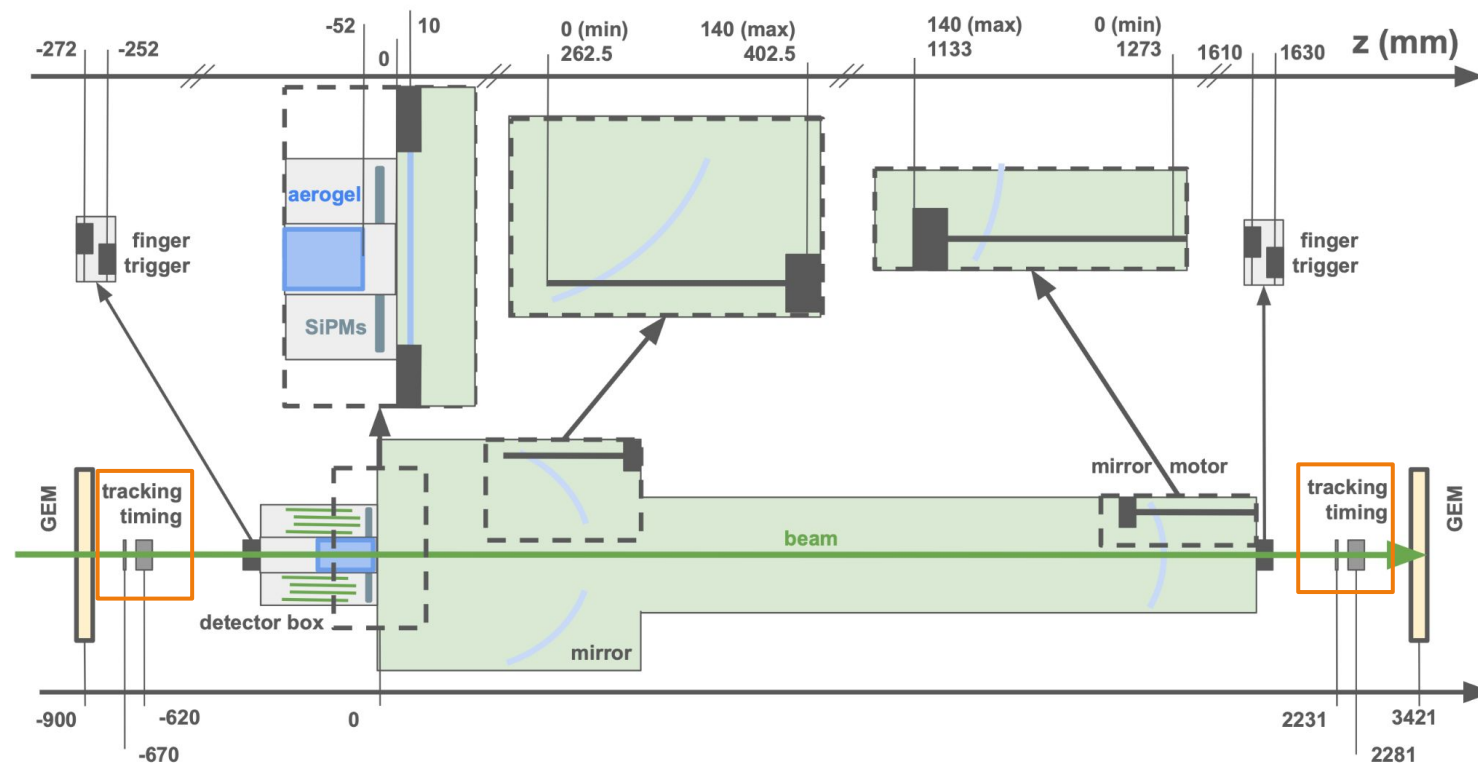
The main trigger was a finger scintillator positioned up- and down-stream



Experimental set-up

NEW

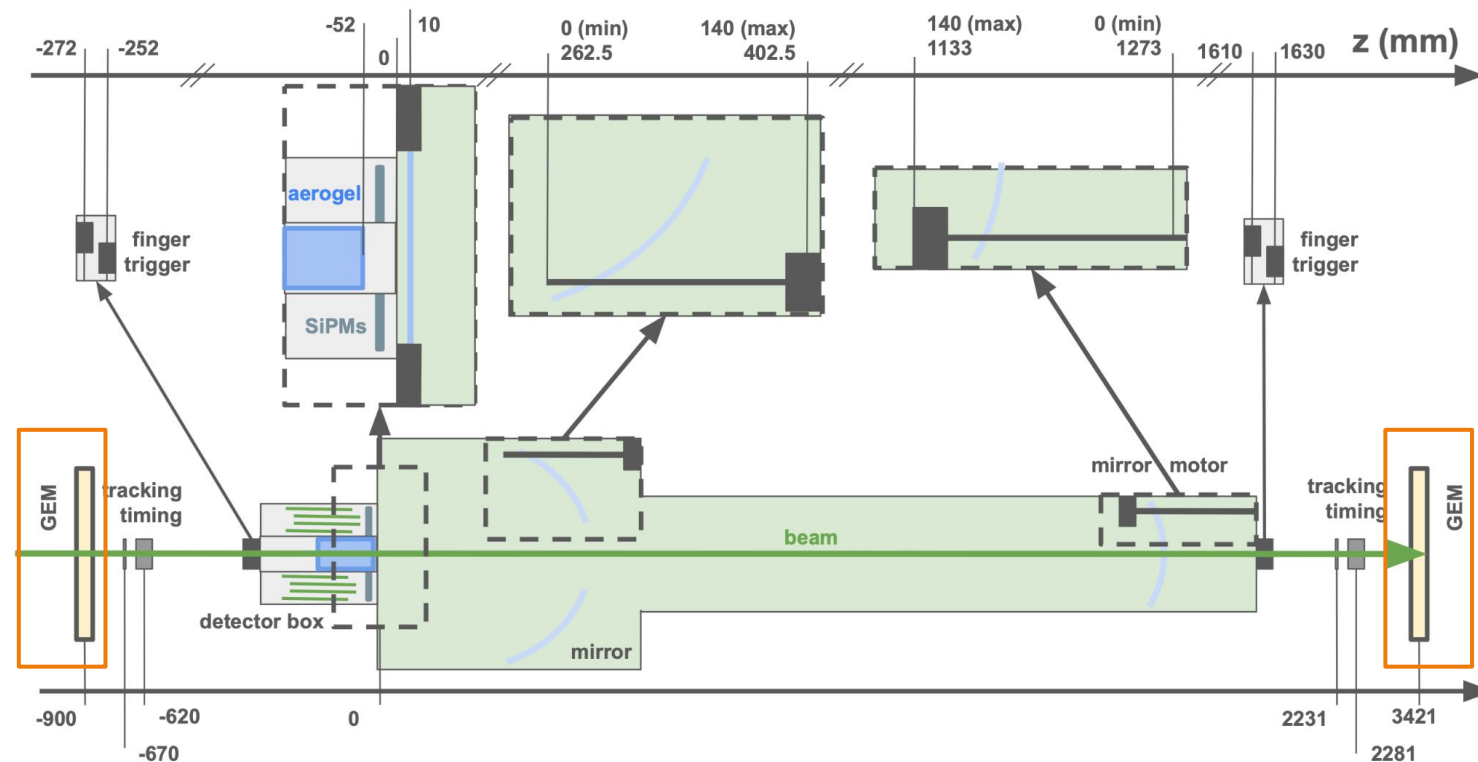
we installed a new timing and tracking system based on SiPM w/ ALCOR readout



Experimental set-up

NEW

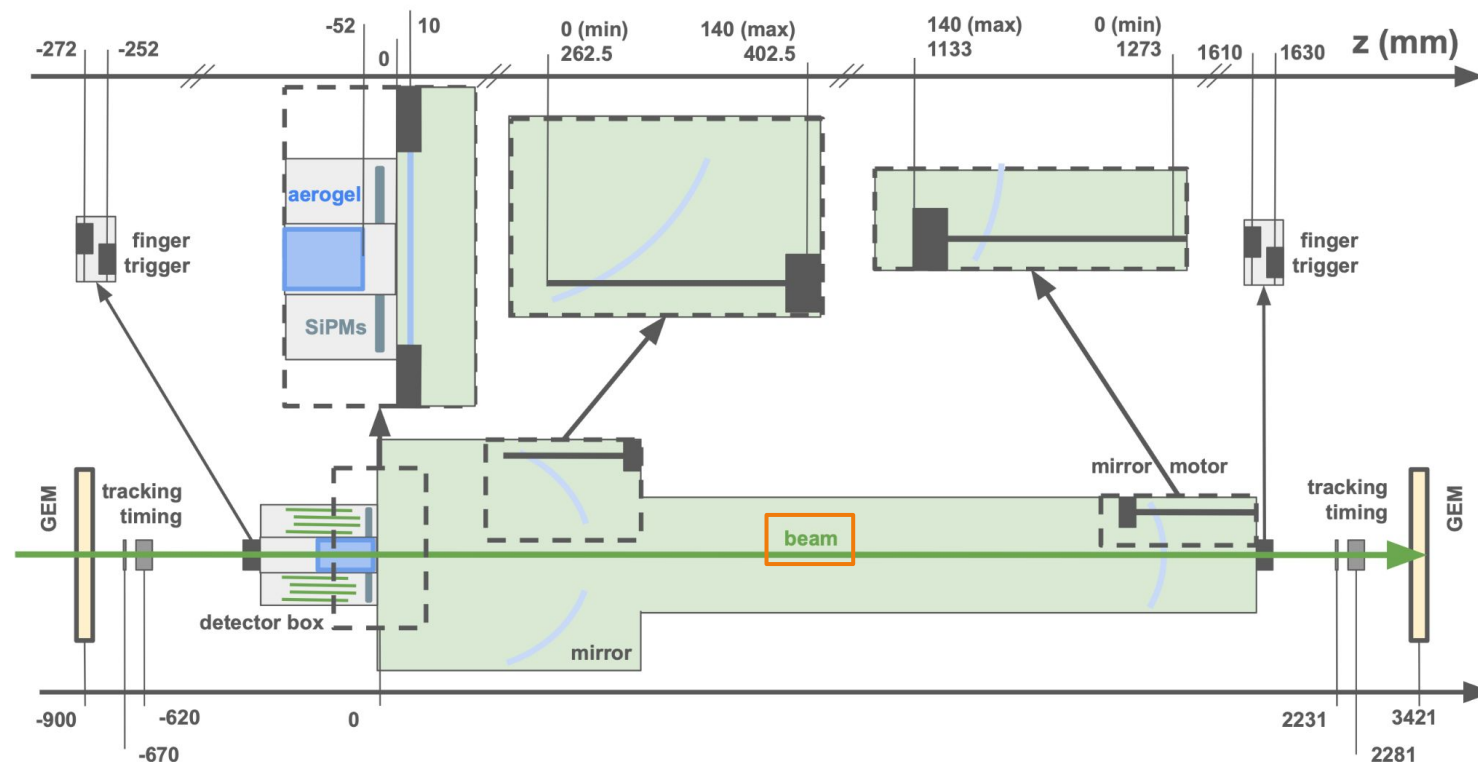
we now have a portion of the runs where the GEM information is available



Experimental set-up

NEW

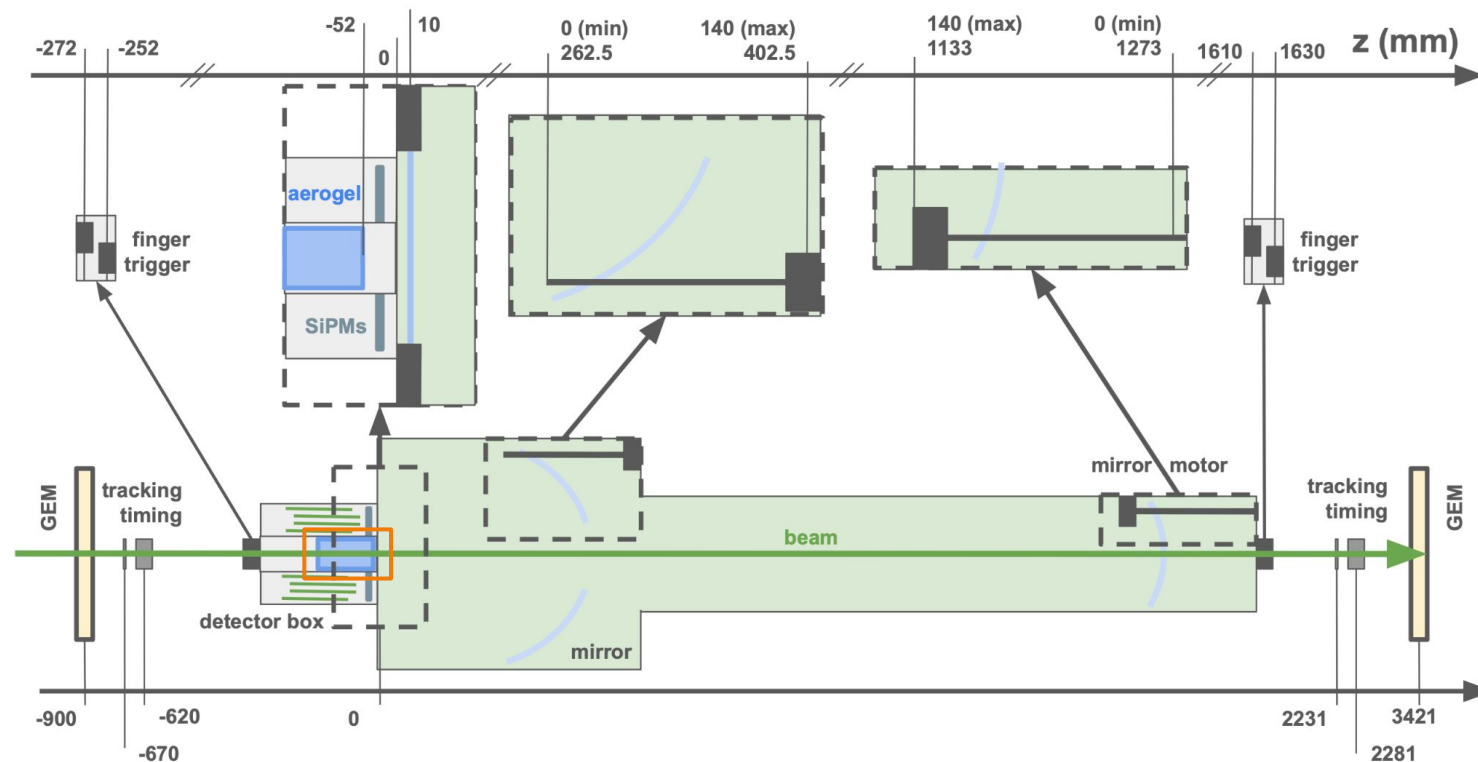
This year we were main users and ma



Experimental set-up

NEW

We worked on the radiator



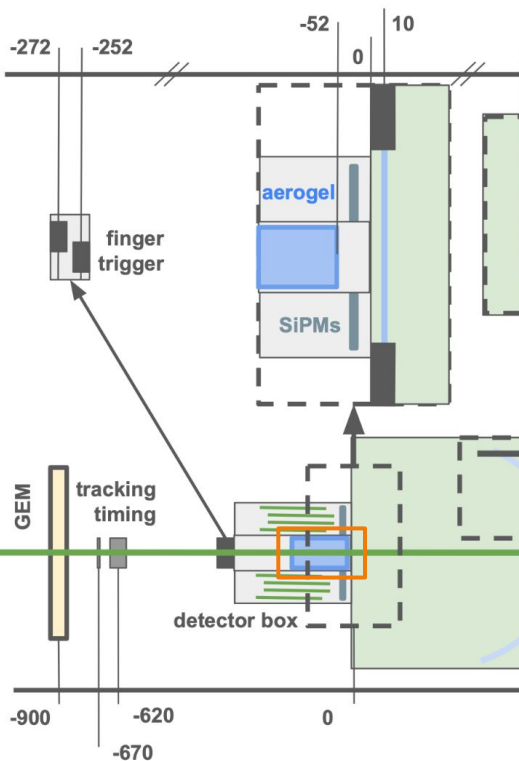
Experimental set-up: aerogel

NEW

We worked on the aerogel radiator

standard*

.021 .021



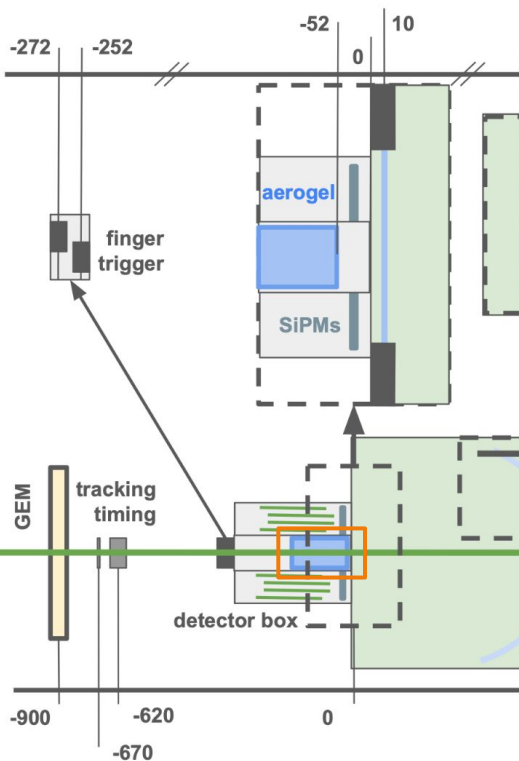
(*) the ref index is not exactly .021 for all tiles

Experimental set-up: aerogel

NEW

We worked on the aerogel radiator:

- different number of tiles



standard*

.021 .021

bkg

x

bkg analysis!

single

.021

quadrupole

.021 .021 .021 .021

(*) the ref index is not exactly .021 for all tiles

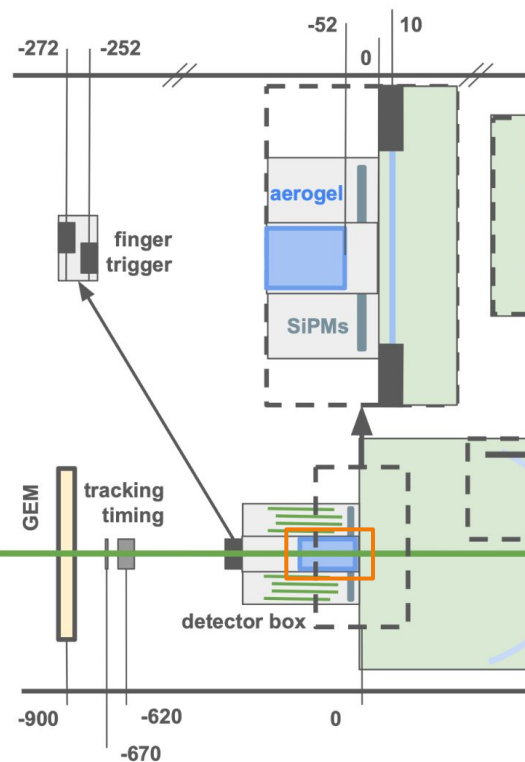
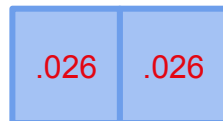
Experimental set-up: aerogel

NEW

We worked on the aerogel radiator:

- different number of tiles
- different ref index

higher ref index

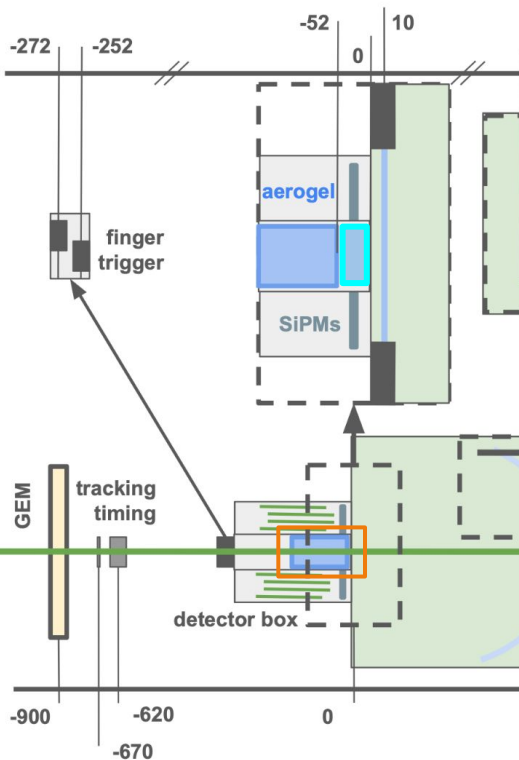


Experimental set-up: aerogel

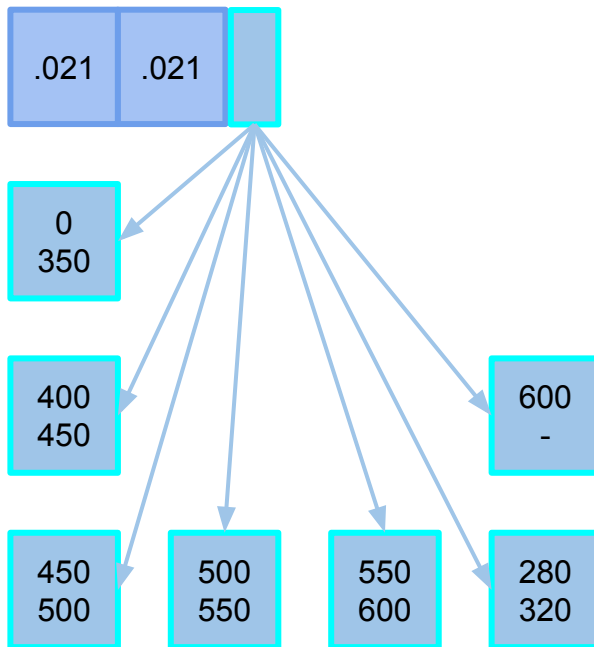
NEW

We worked on the aerogel radiator:

- different number of tiles
- different ref index
- different filters for wavelength (nm)



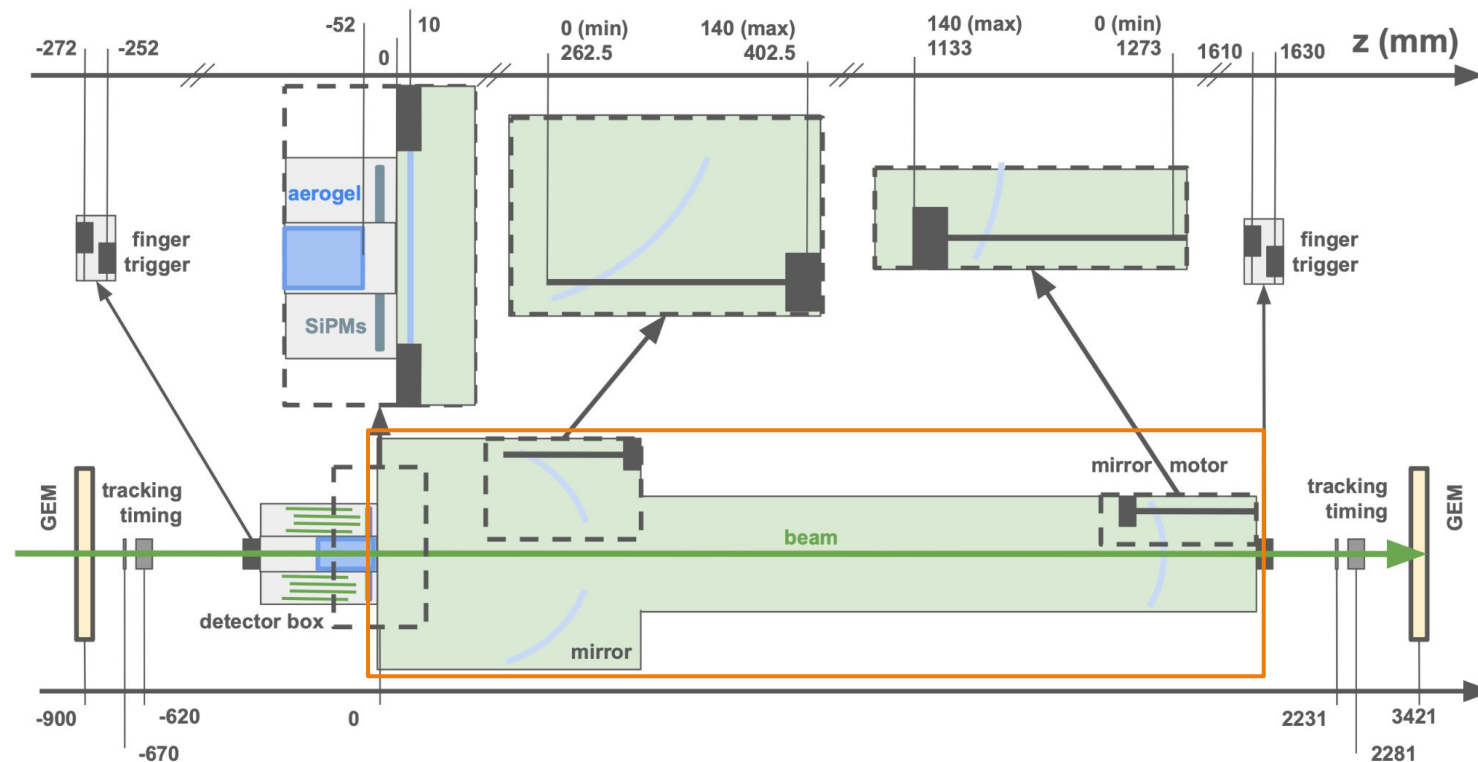
standard + **filter**



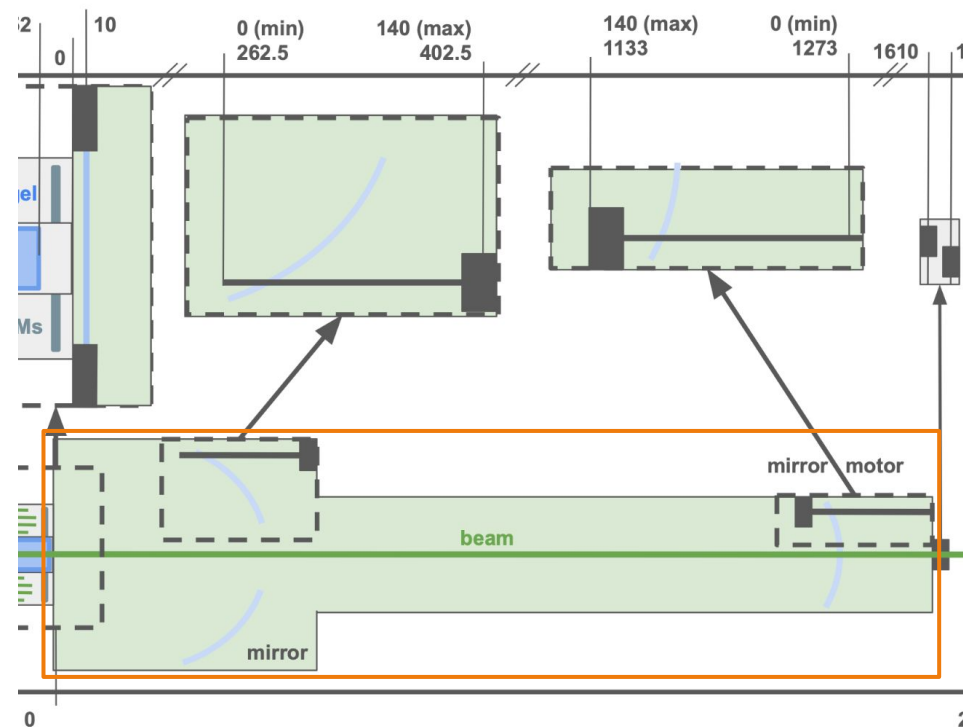
Experimental set-up

NEW

We worked on the radiator



Experimental set-up



standard

C2F6
1.0008

new gas

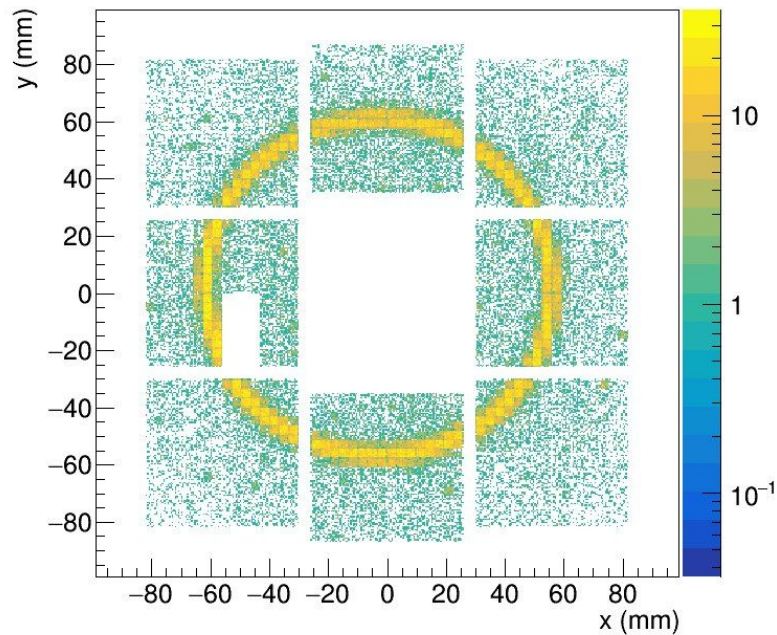
C4F10
1.0014

NEW

We worked on the gas radiator

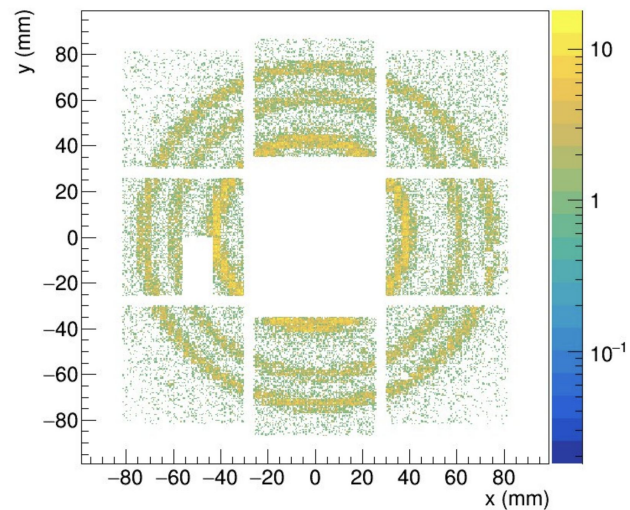
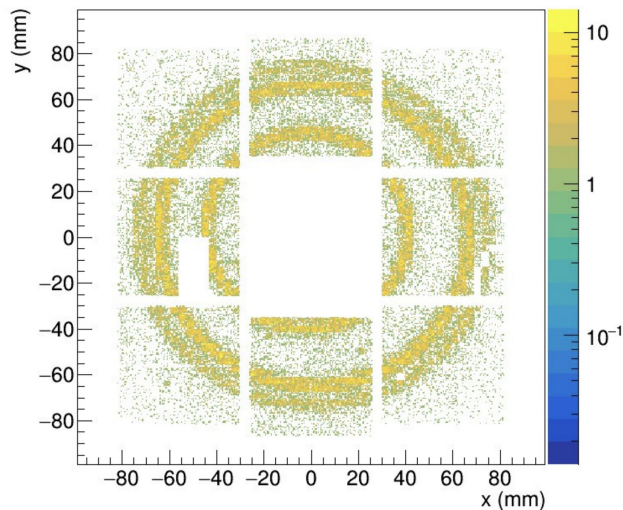
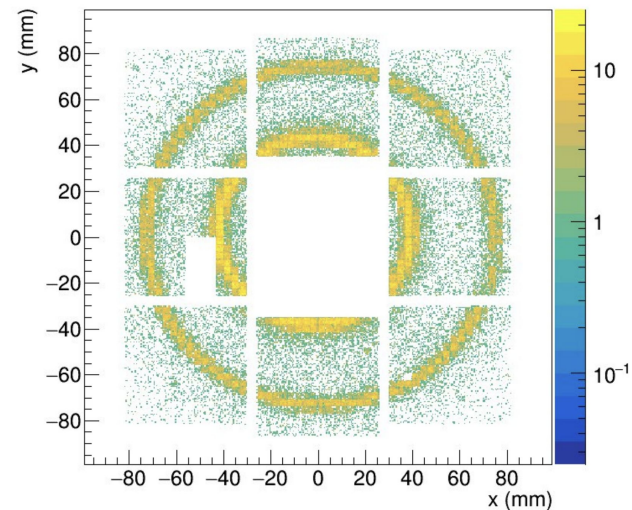
A few Q&A plots

We now have full possible coverage



A few Q&A plots

A few momentum scans



Analysis opportunities

All: - QA - Bkg studies

2023 beam test:

- Overvoltage scan
- Mirror scan
- Threshold scan
- Consistency of photon yield and resolution from 2023 to 2024

2024 beam test:

- Momentum scan w/ aerogel
- Momentum scan w/ Gas
- Momentum scan w/ both
- Resolution of new gas C₄F₁₀
- Resolution of new aerogel
- Resolution of multiple aerogel
- Resolution measurement improvement with GEM information
- Using GEM to understand angle deformations of ring
- Analysis of filtered light