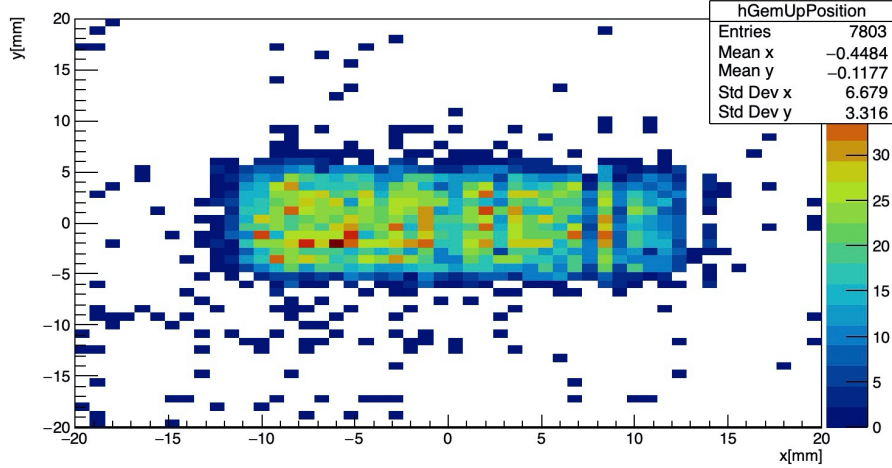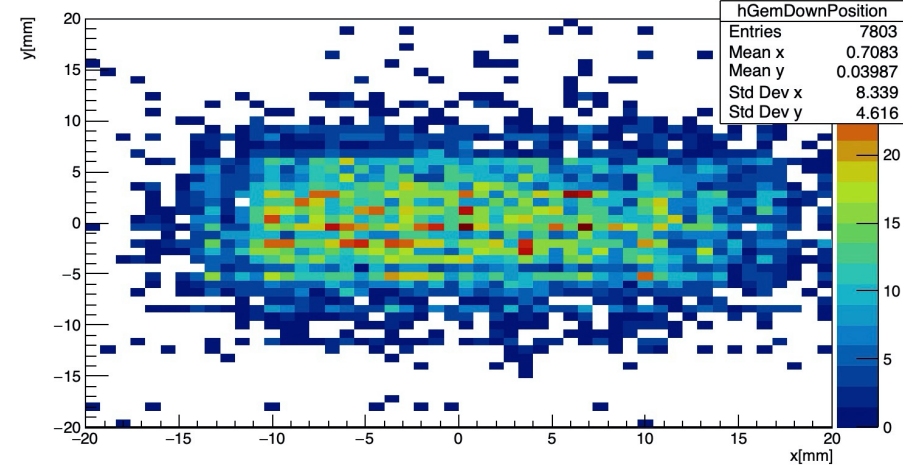Beam parameters better than PS: 120 GeV proton low-emittance beam
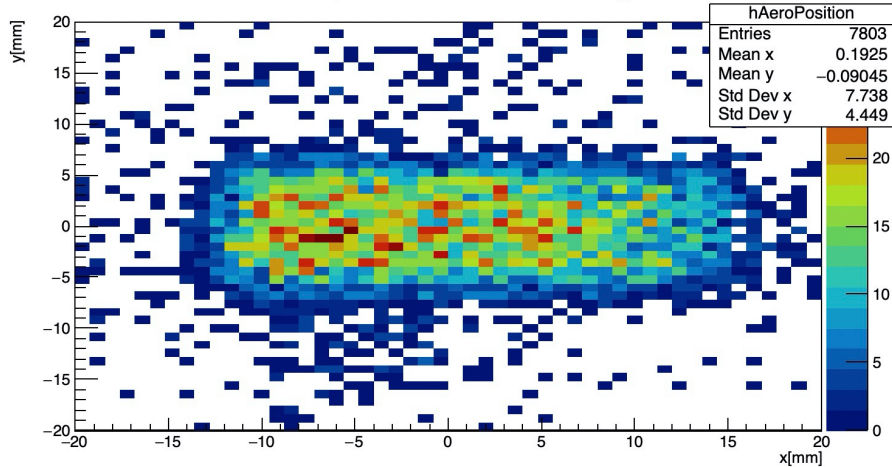

Particle position on upstream GEM

hGemUpPosition	
Entries	7803
Mean x	−0.4484
Mean y	−0.1177
Std Dev x	6.679
Std Dev y	3.316

Particle position on downstream GEM

hGemDownPosition	
Entries	7803
Mean x	0.7083
Mean y	0.03987
Std Dev x	8.339
Std Dev y	4.616

Particle position from GEM at aerogel

hAeroPosition	
Entries	7803
Mean x	0.1925
Mean y	−0.09045
Std Dev x	7.738
Std Dev y	4.449

Particle slope from GEM

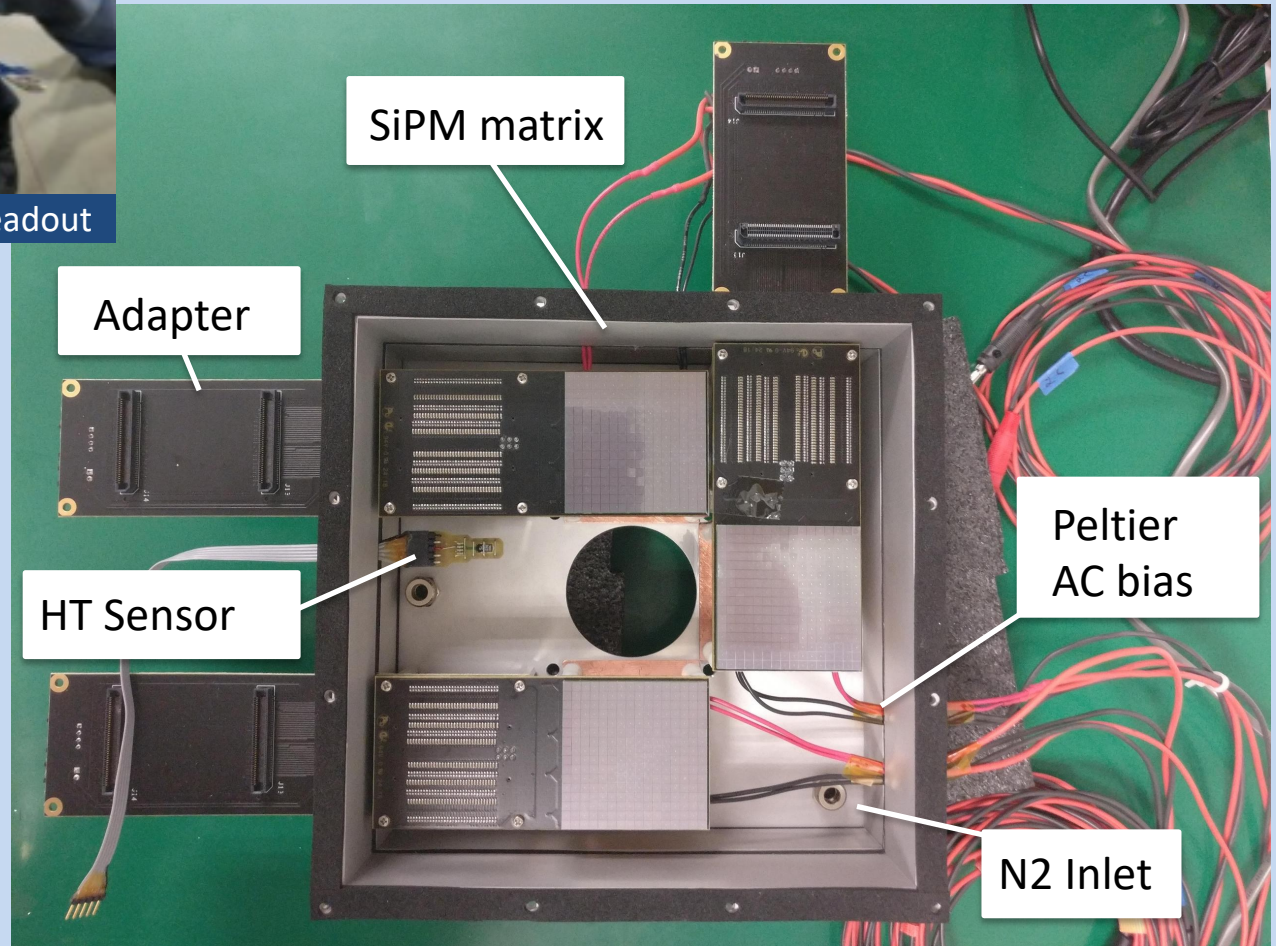| hAeroAngle	
Entries	7803
Mean x	0.2377
Mean y	0.174
Std Dev x	1.584
Std Dev y	1.713

H13700 MAPMT / MAROC3 digital readout

Large area MPPC matrices provide a good gym
for the dRICH extended SiPM detector
(eRD102 deliverable in sprin 2023)

SiPM matrix

Adapter
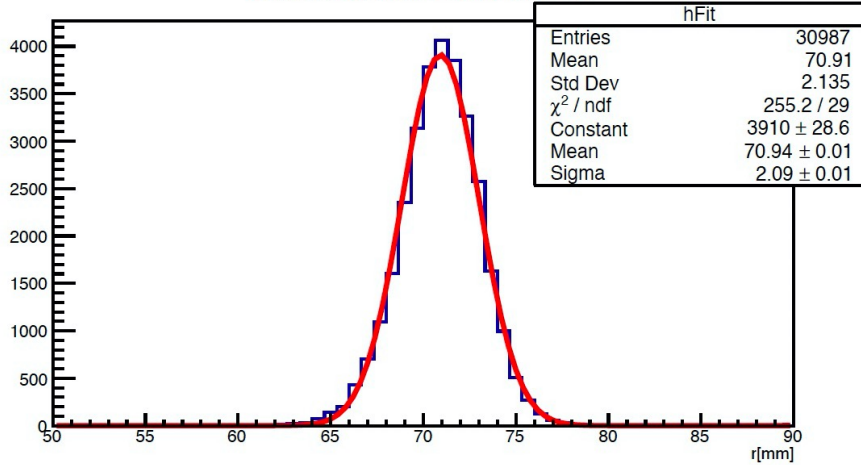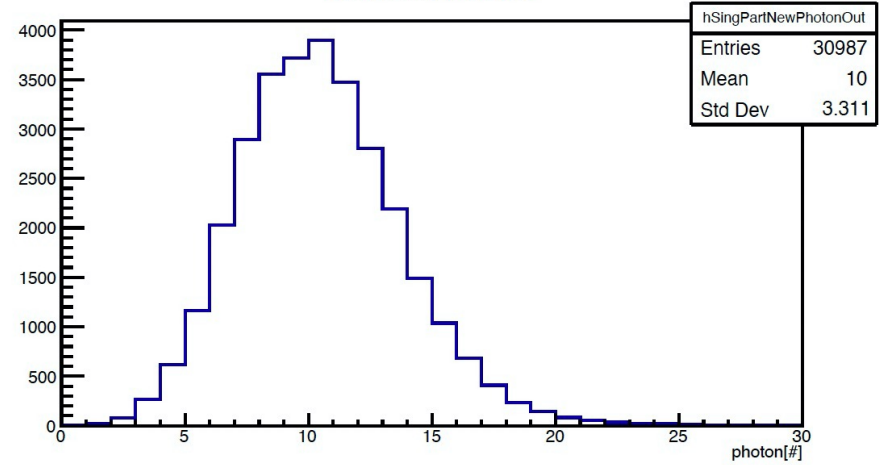
HT Sensor

Peltier
AC bias

N2 Inlet

Photon yield higher but resolution worse than PS: need to improve timing
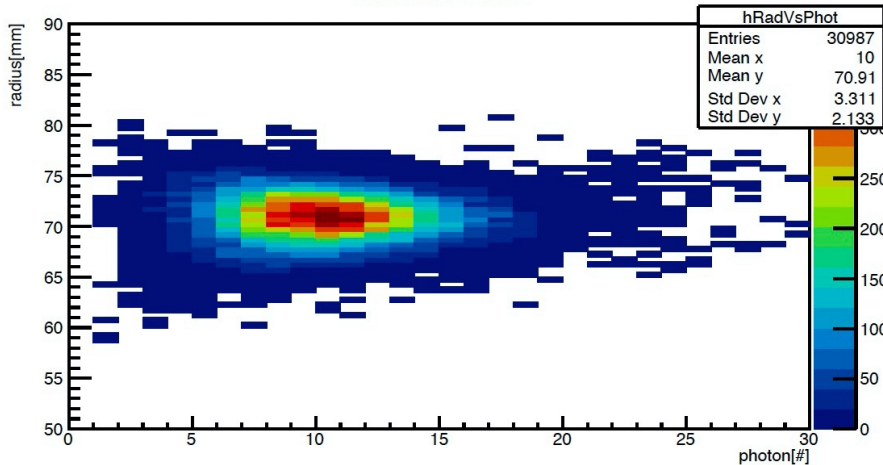Define procedures for calibration and pedestals (gain + thresholds)
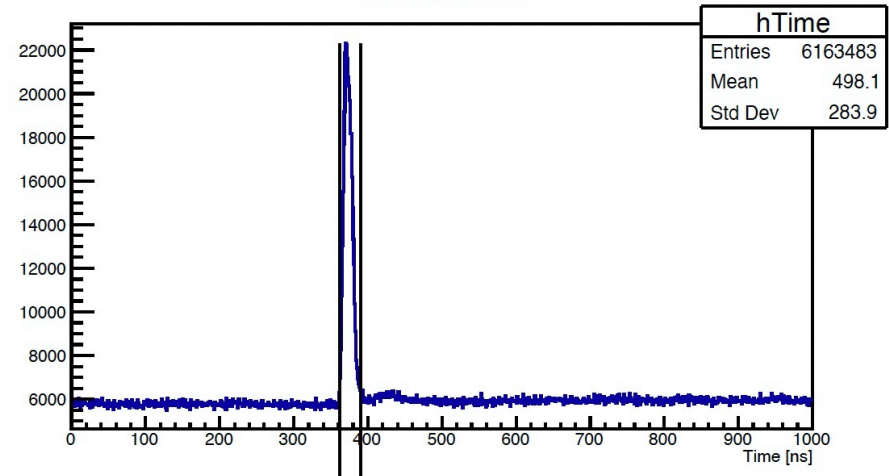
Outer single photon radius

hSingPhotonRadiusOut	
Entries	288607
Mean	70.45
Std Dev	5.941
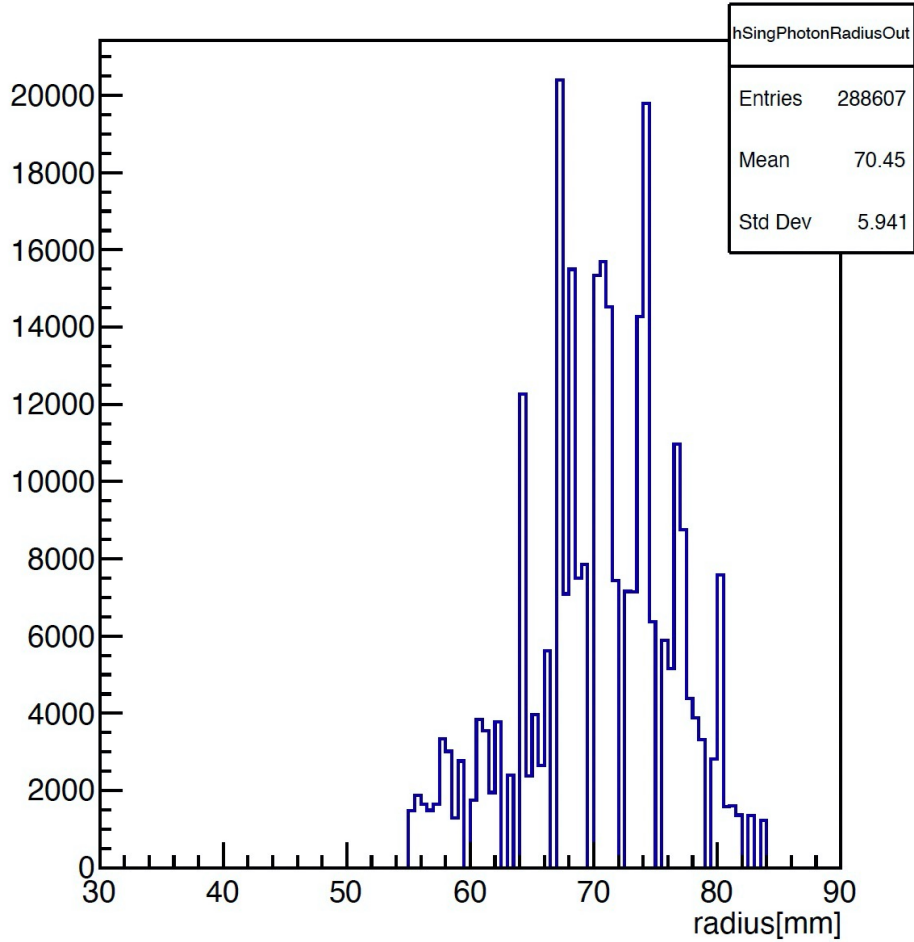
Outer single photon radius - corrected

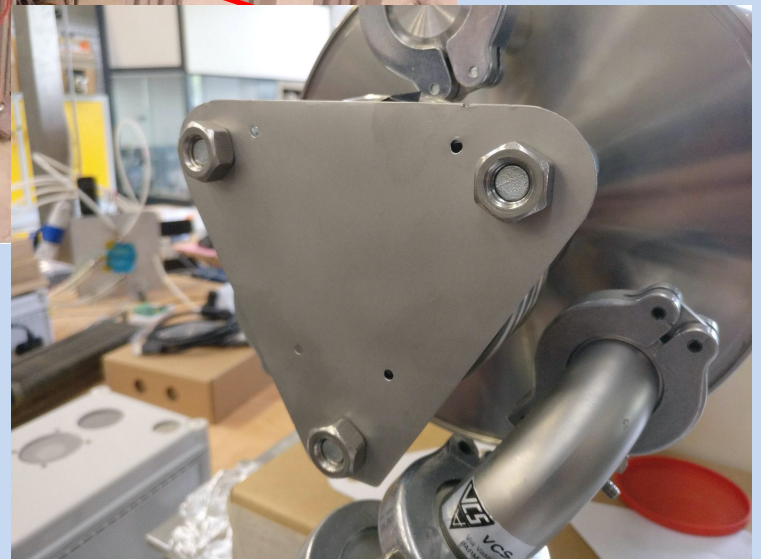| hSingPhotonNewRadiusOut	
Entries	288607
Mean	71.74
Std Dev	5.56
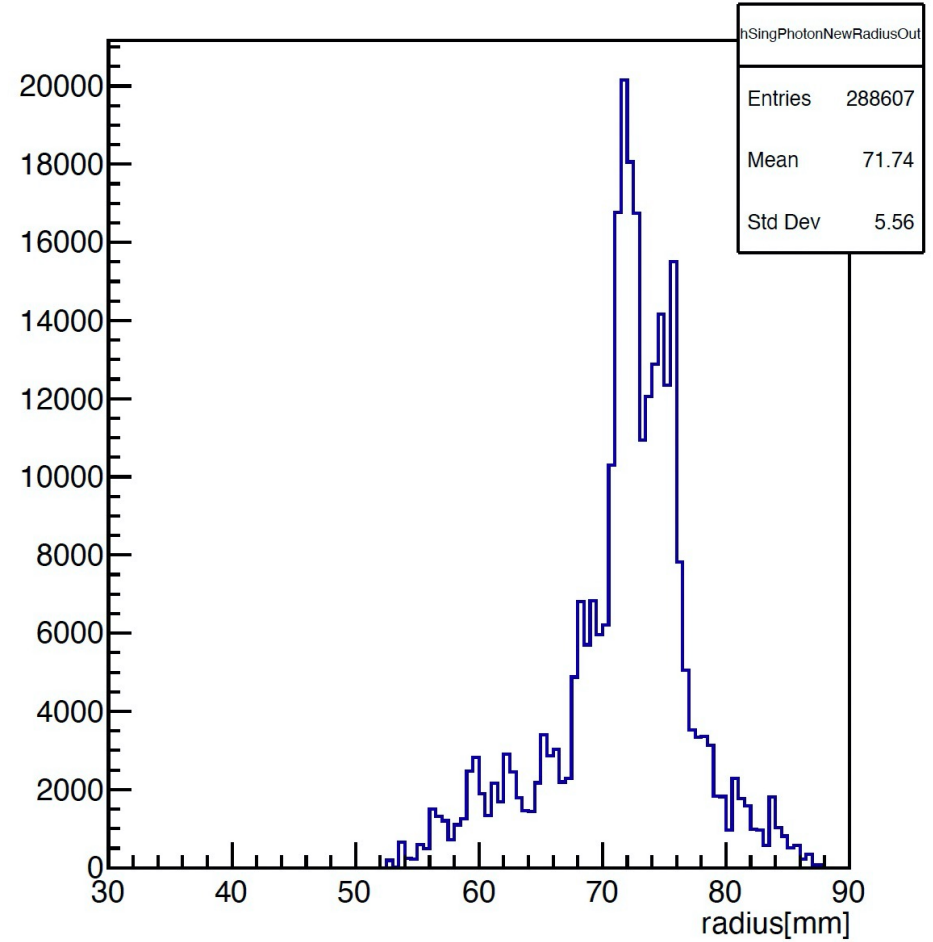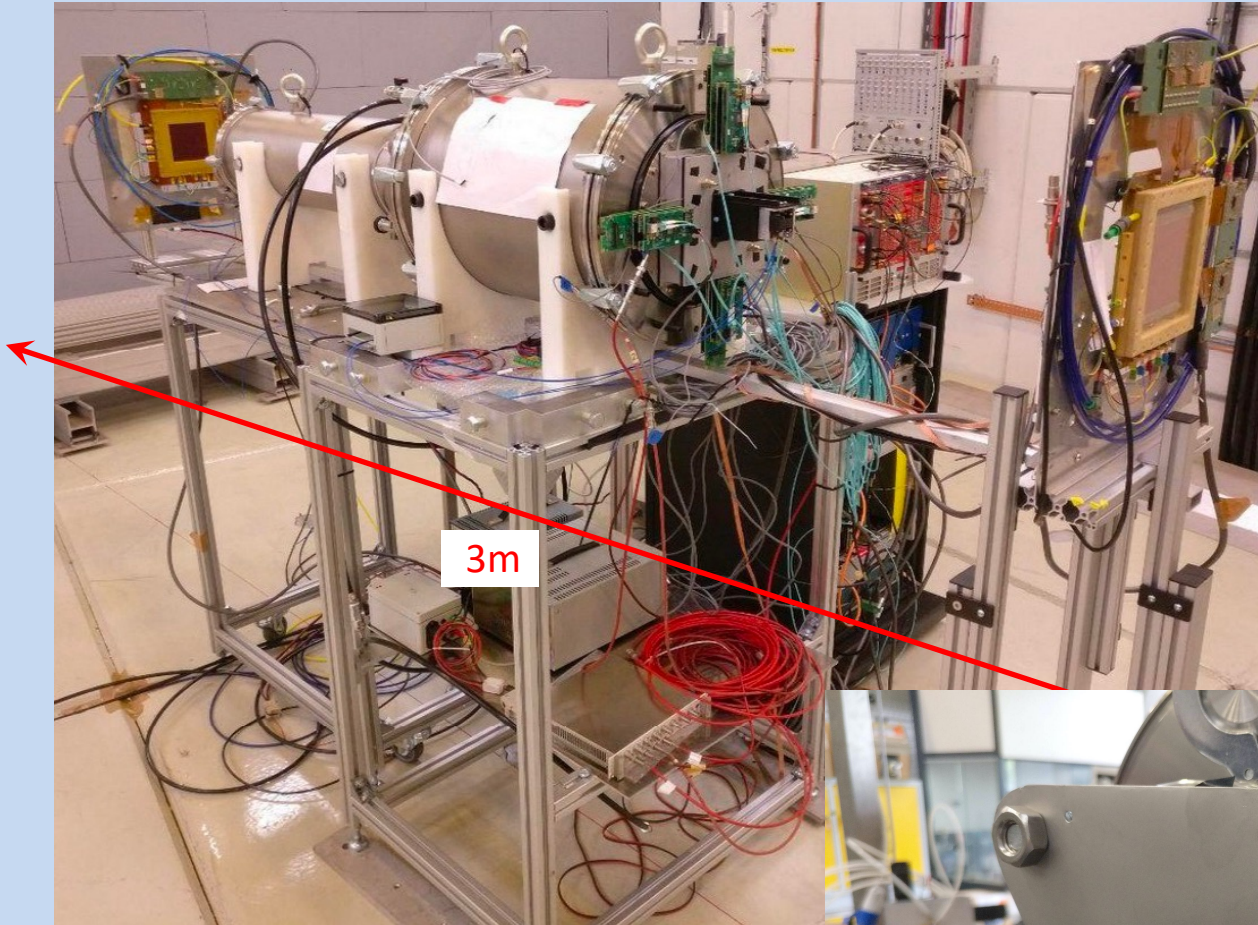
Alignment system (laser + reference)

Upgrade of the support carts

Gas:

   submitted request to CERN (David Jaillet) under RD51-TS account
   2x 10 lt bottles (~1 available from 2021 campaign)

Aerogel:

   contacts with Aerogel Factory (Japan)

      vary refractive index +/- 0.002

      extended area ?
         ~ 11 x 11 cm^2 for low-temperature drying
         ~ 14 x 14 cm^2 for high-temperature drying
         dedicated R&D

Pre-calibrate the complete readout chain

Automatize procedures for online re-calibration and monitoring

Prepare an online display and analysis

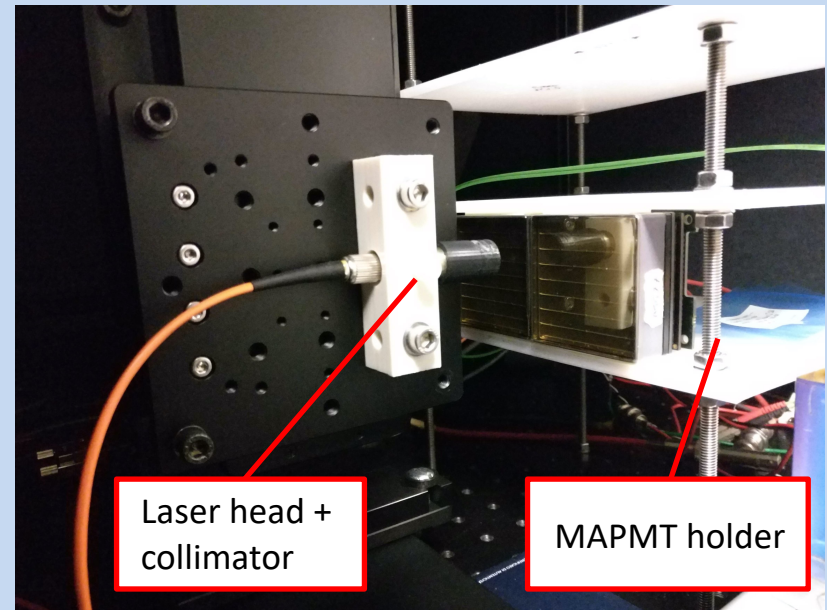Characterize optical components

Refine simulations

INFN

632 nm and 407 nm picosecond pulsed laser light
Light concentrator to scan the pensor surface
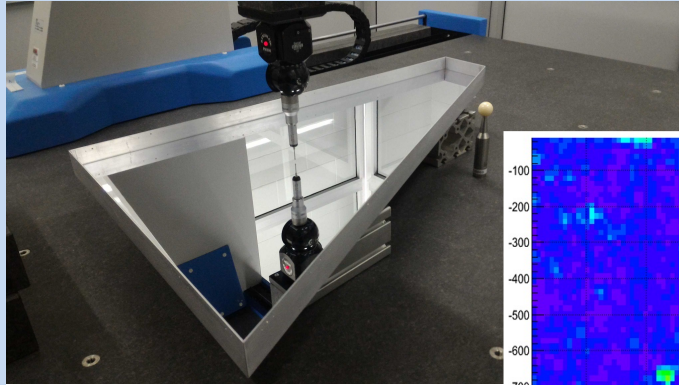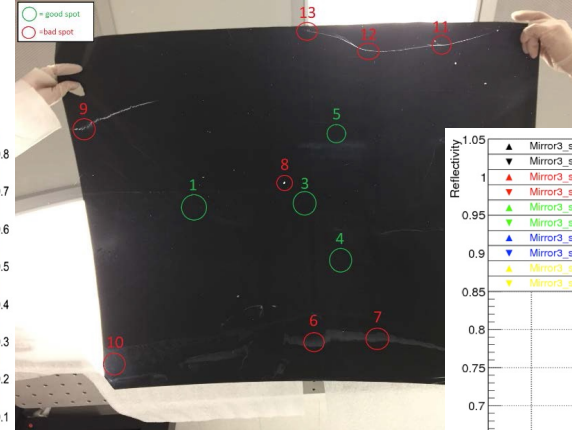Flexible layout supporting various sensors and
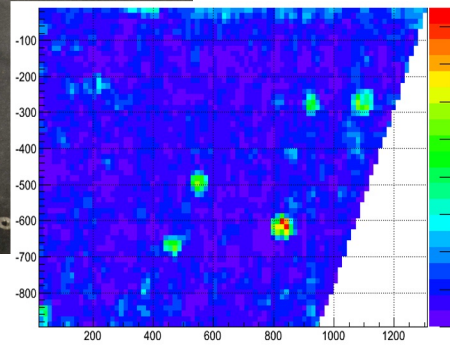Front-End electronics

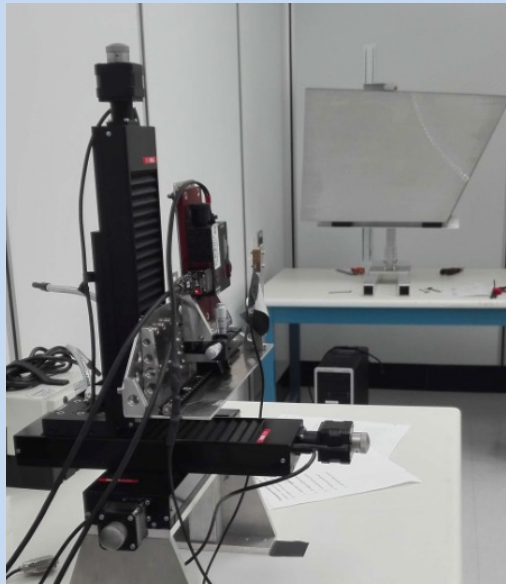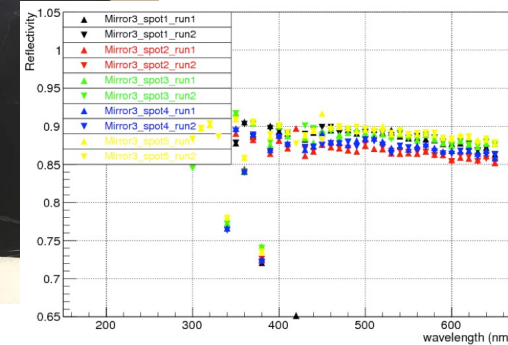Laser head + collimator

MAPMT holder

Facility to study detailed mirror optical properties (surface map, radius of curvature, reflectivity)
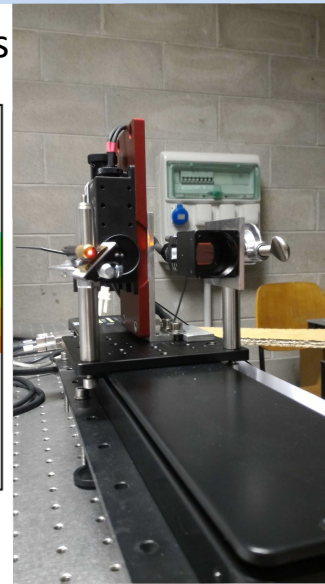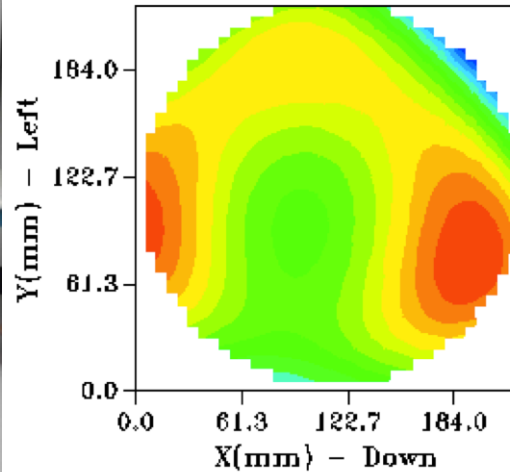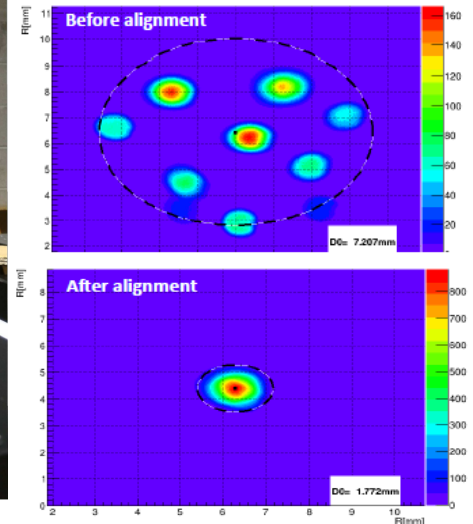

Planarity
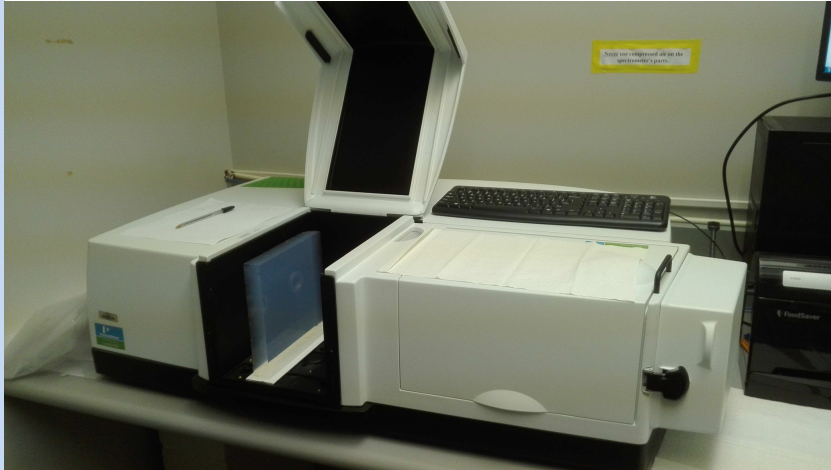
Reflectivity

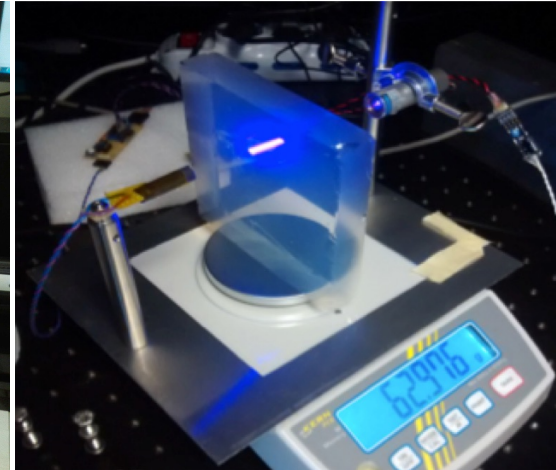Shack-Hartmann: Aberrations

Point Image: Alignment

Facility to study detailed aerogel optical properties
(refractive index, surface planarity, forward scattering)
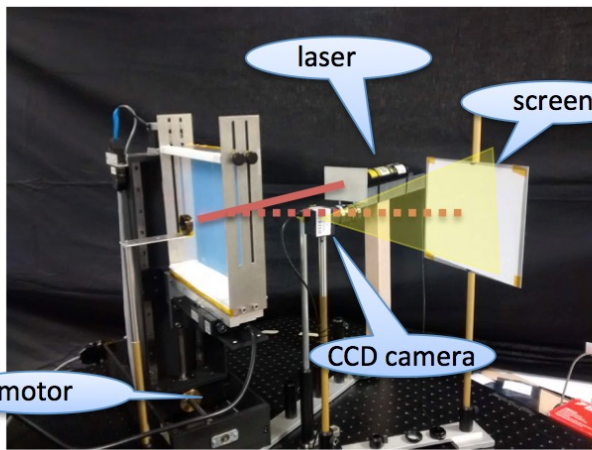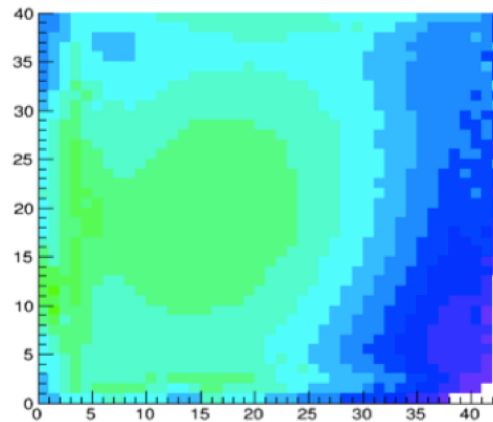safe handling and Interplay with gas radiator

Controlled storage

Spectrophotometer

Characterization station

Surface map by laser setup   vs   touch machine

laser

screen

CCD camera

motor