COSMICS IN XS1

LOUIS HELARY (DESY)
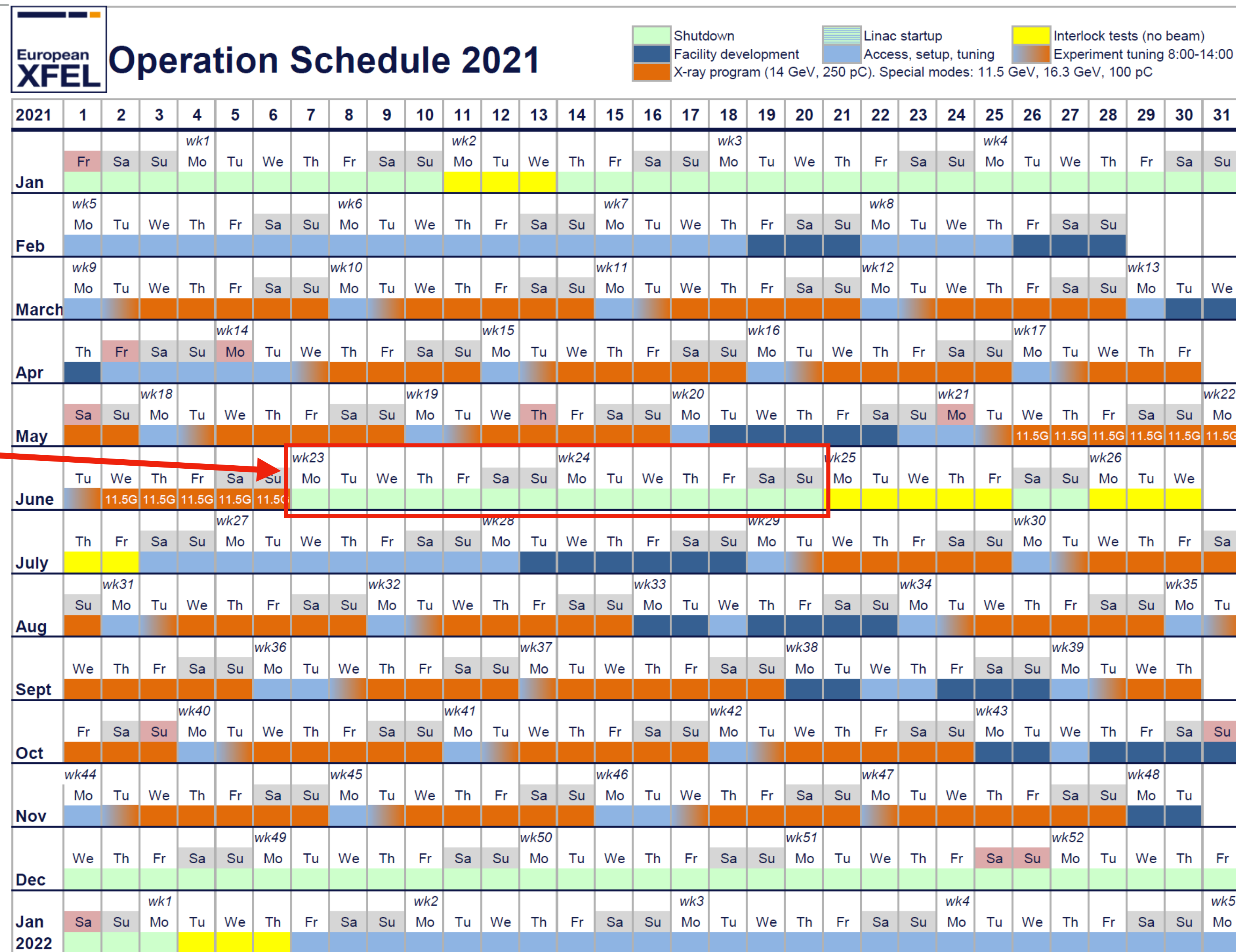
LUXE TECHNICAL MEETING - JUNE 30TH 2021

XFEL SUMMER SHUTDOWN

Getting the accesses and dosimeter was relatively easy.

Still did not managed to get transponder..

Sent a mail to Sven Mohr (D5), but no answer so far.
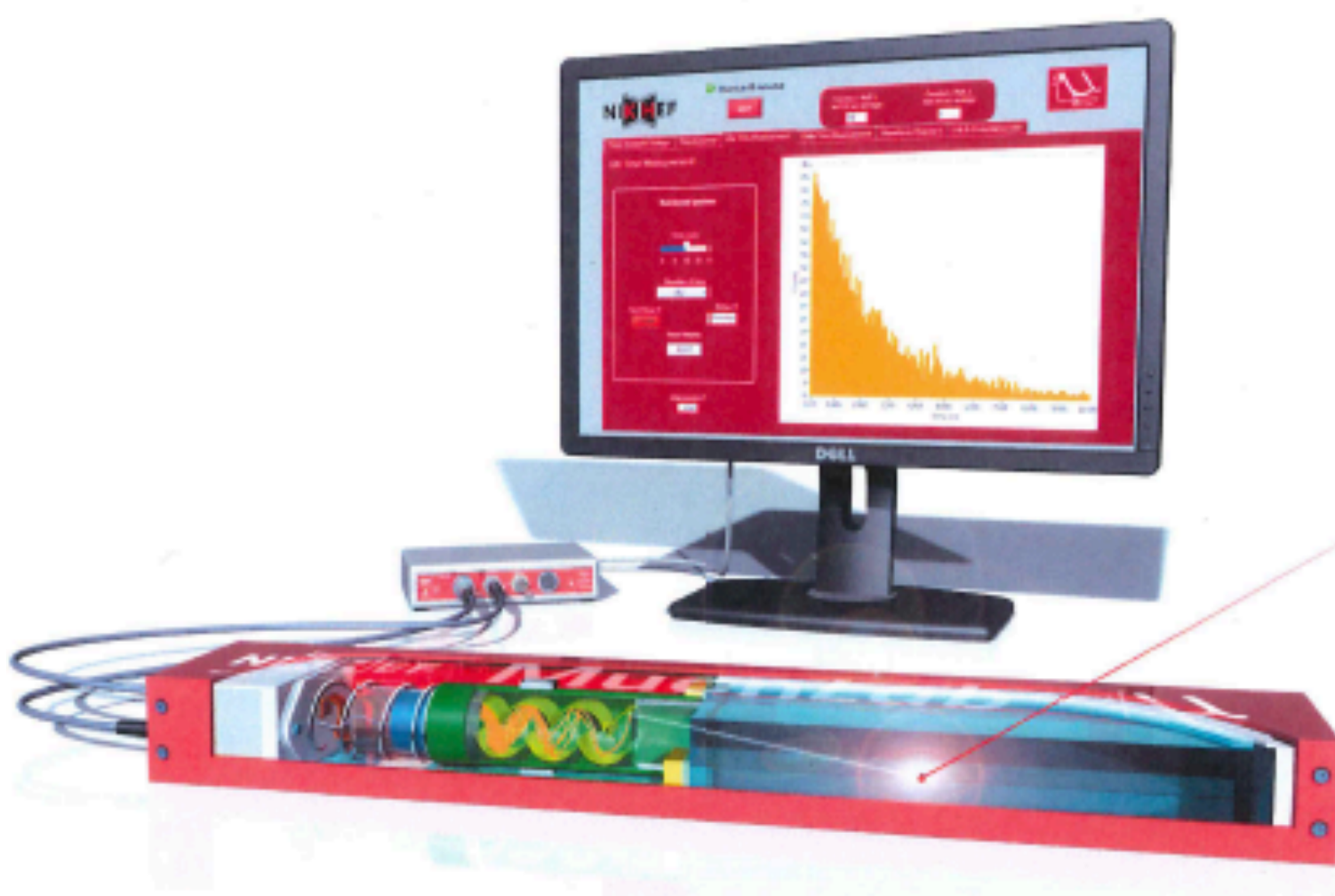
2 weeks access (summer shutdown)

MuonLab

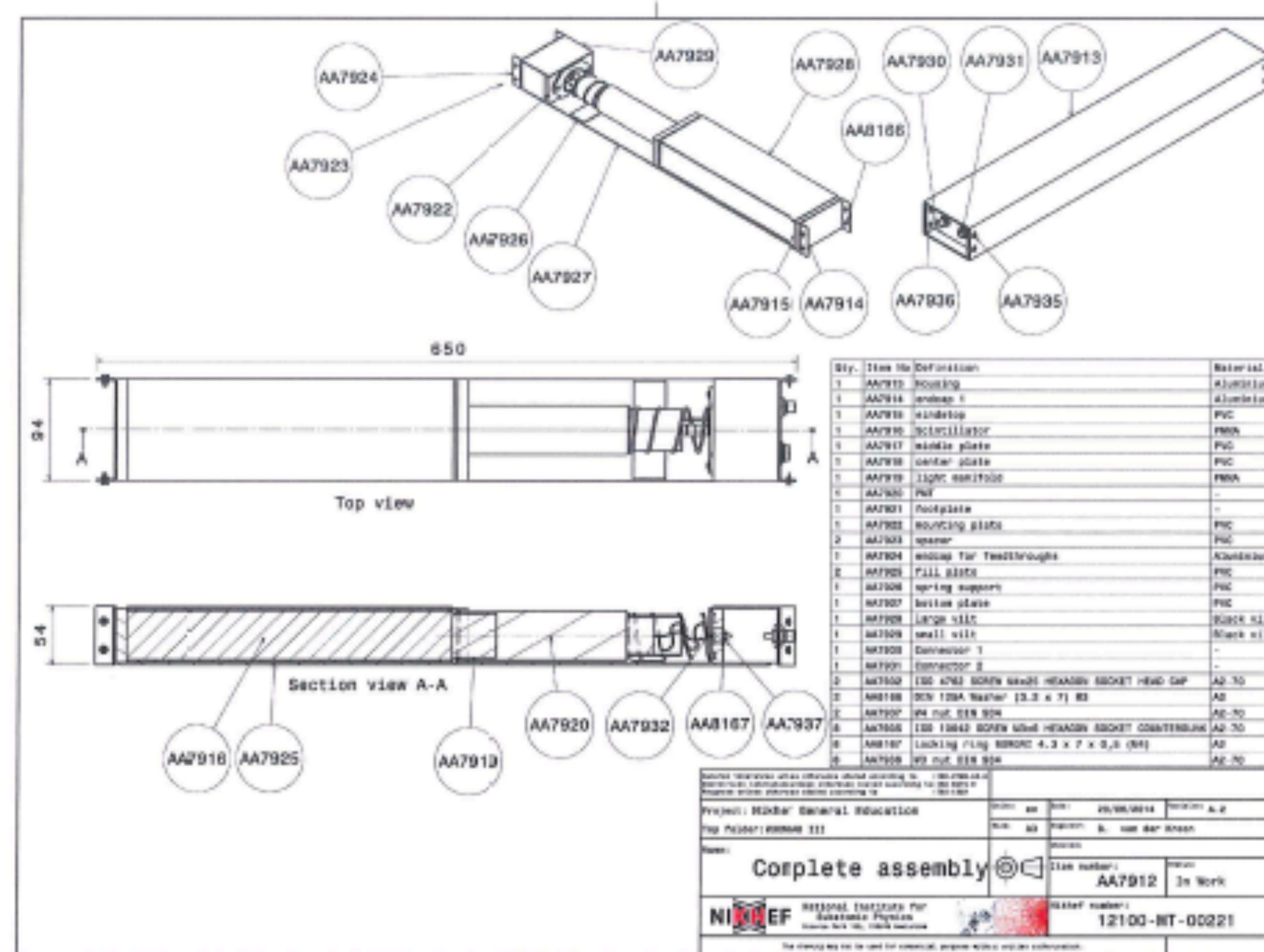**Tabletop instrument for hands-on experiments on muons and electrons**

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Science Park 105
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june 2014

Detectors:
Plastic scintillator 30 x 9 x 5 cm^3 (with PMT R580) or 40 x 9 x 5 cm^3 (with PMT R6094)
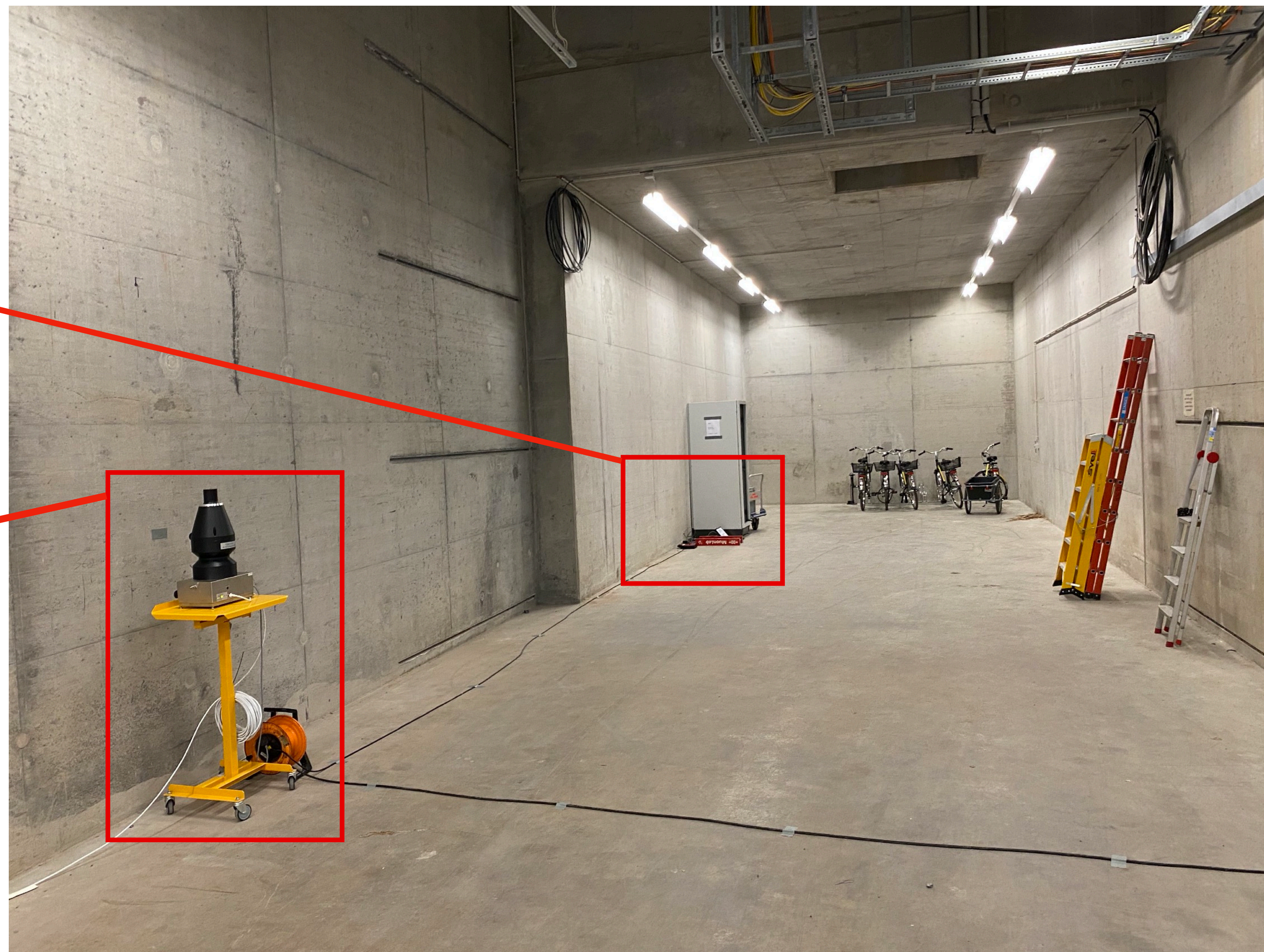Photomultiplier Hamamatsu R580 or Hamamatsu R6094

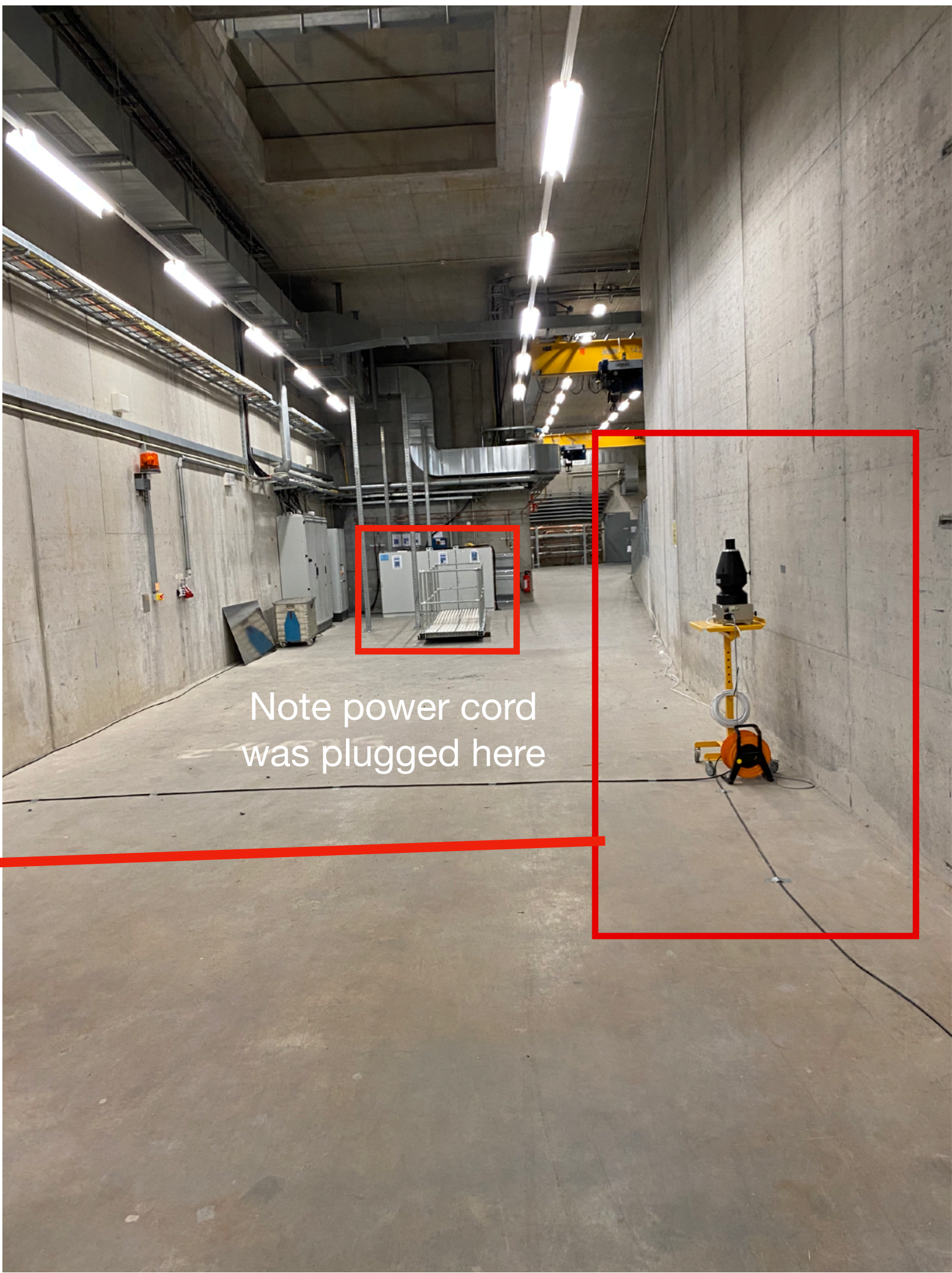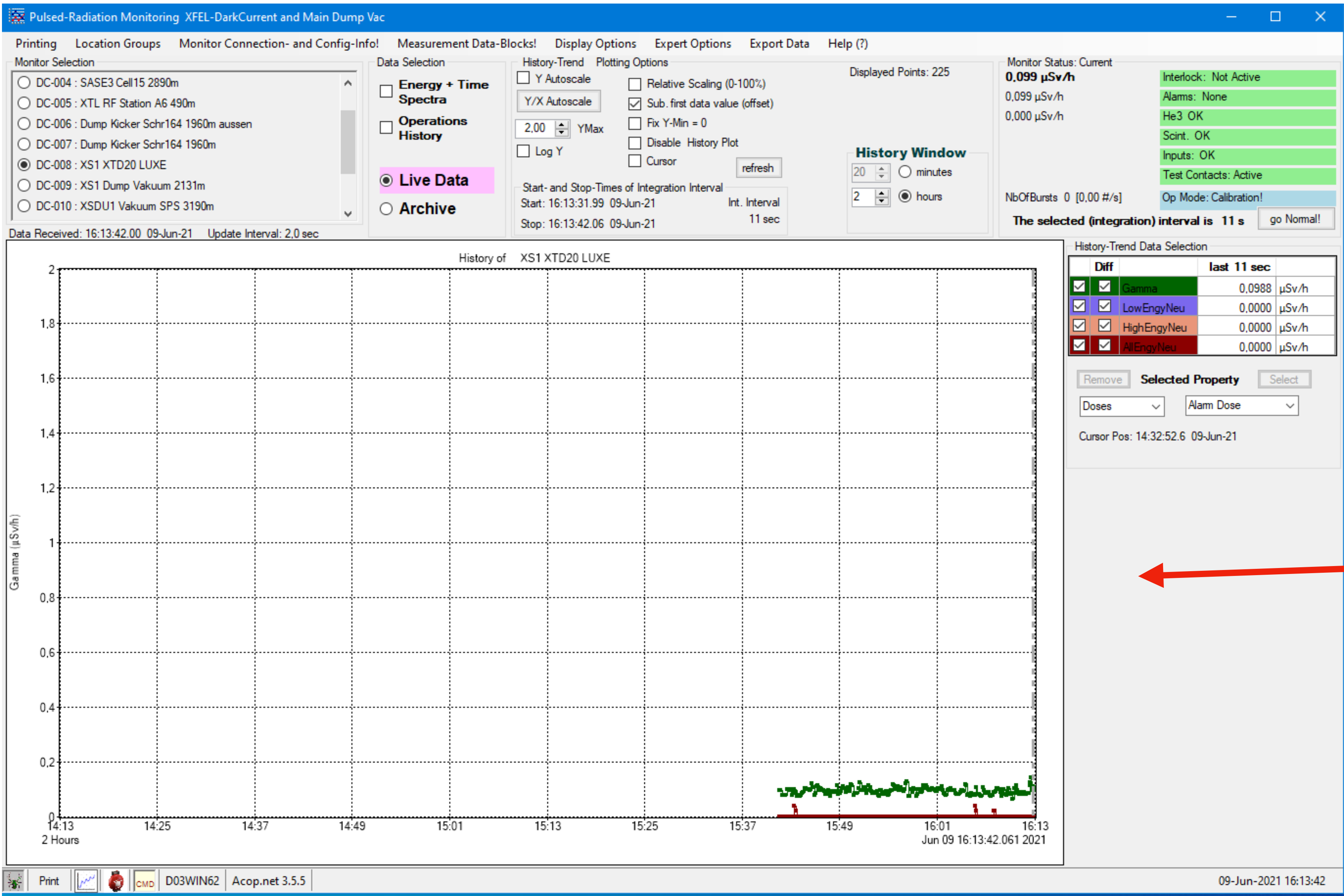Complete assembly of R580 detector (with R6094 some minor modifications)

Rather simple to use, but challenging to make it work (needed a 32 bit labview version.)

WHERE ARE THE DETECTORS?

Would have prefer to put scintillators here:
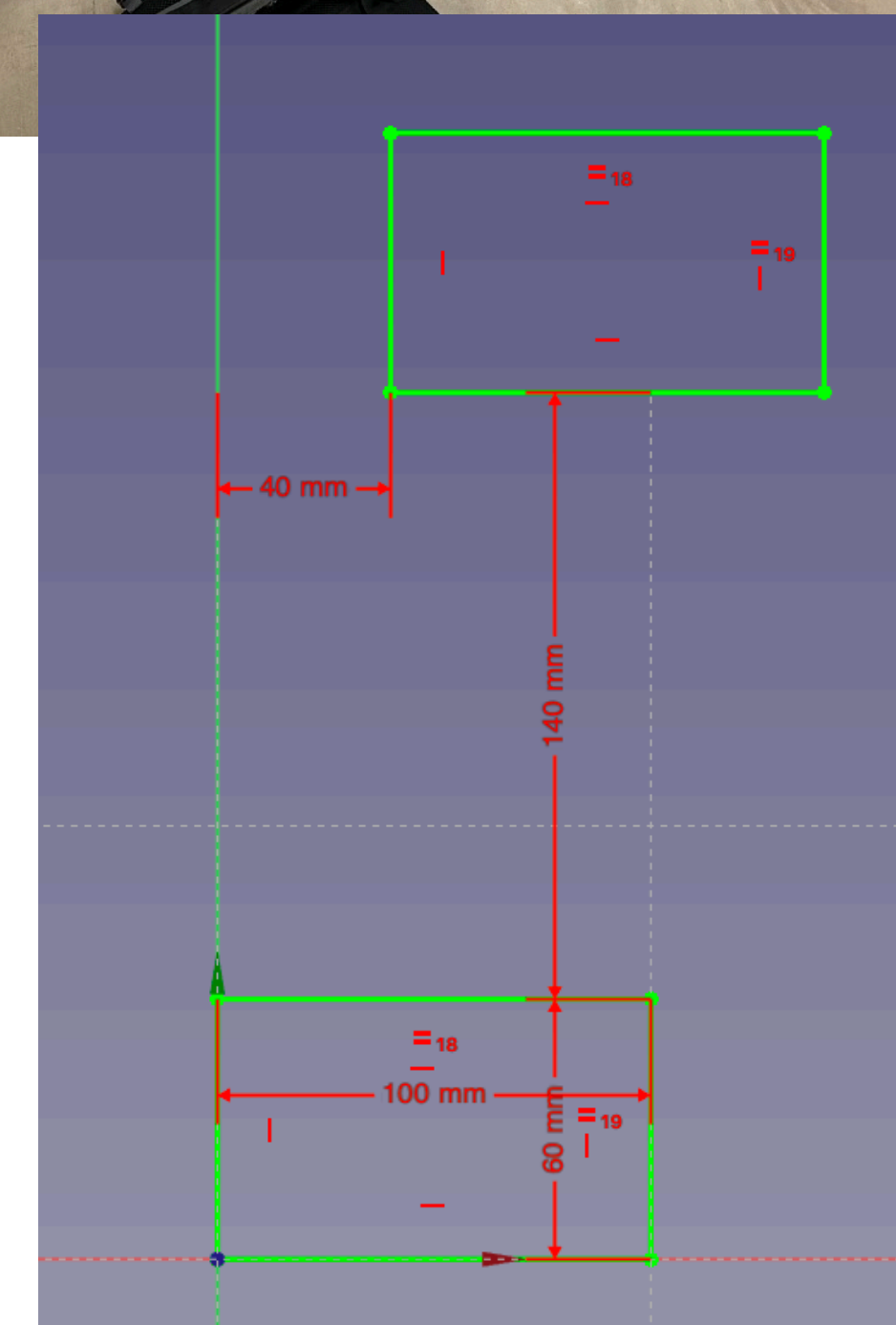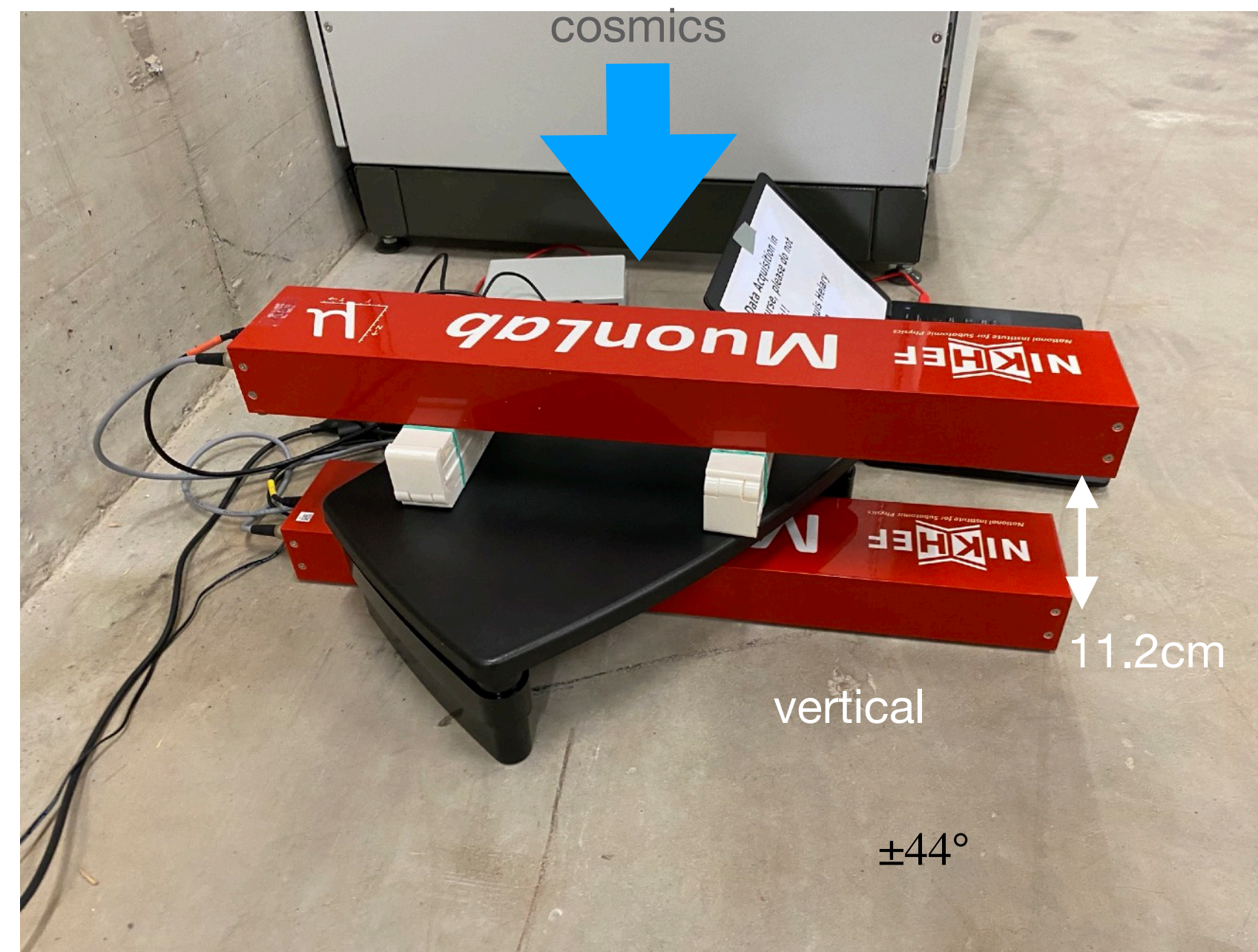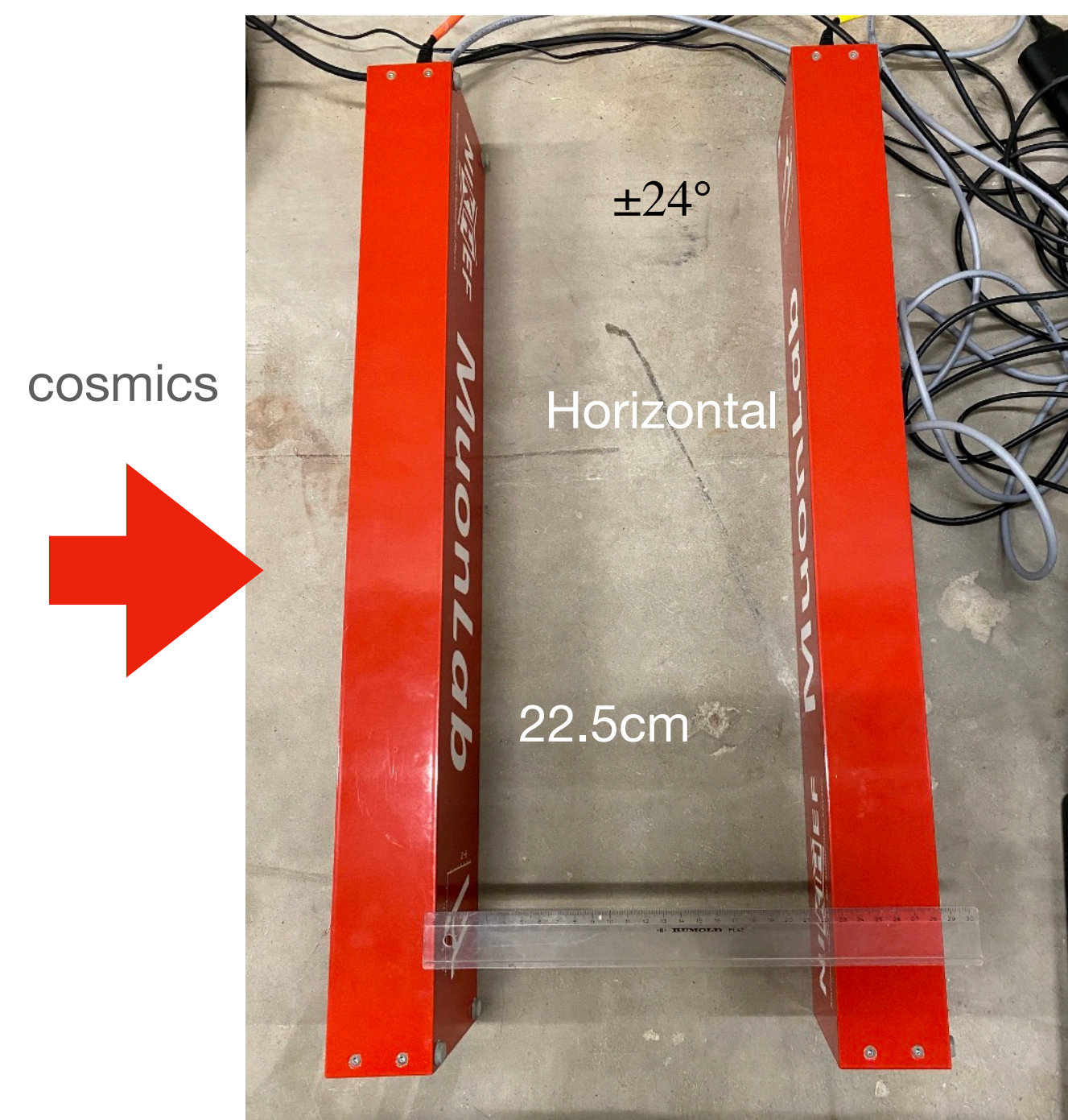but unfortunately power cord not long enough

SIDE NOTE NEUTRON DETECTOR

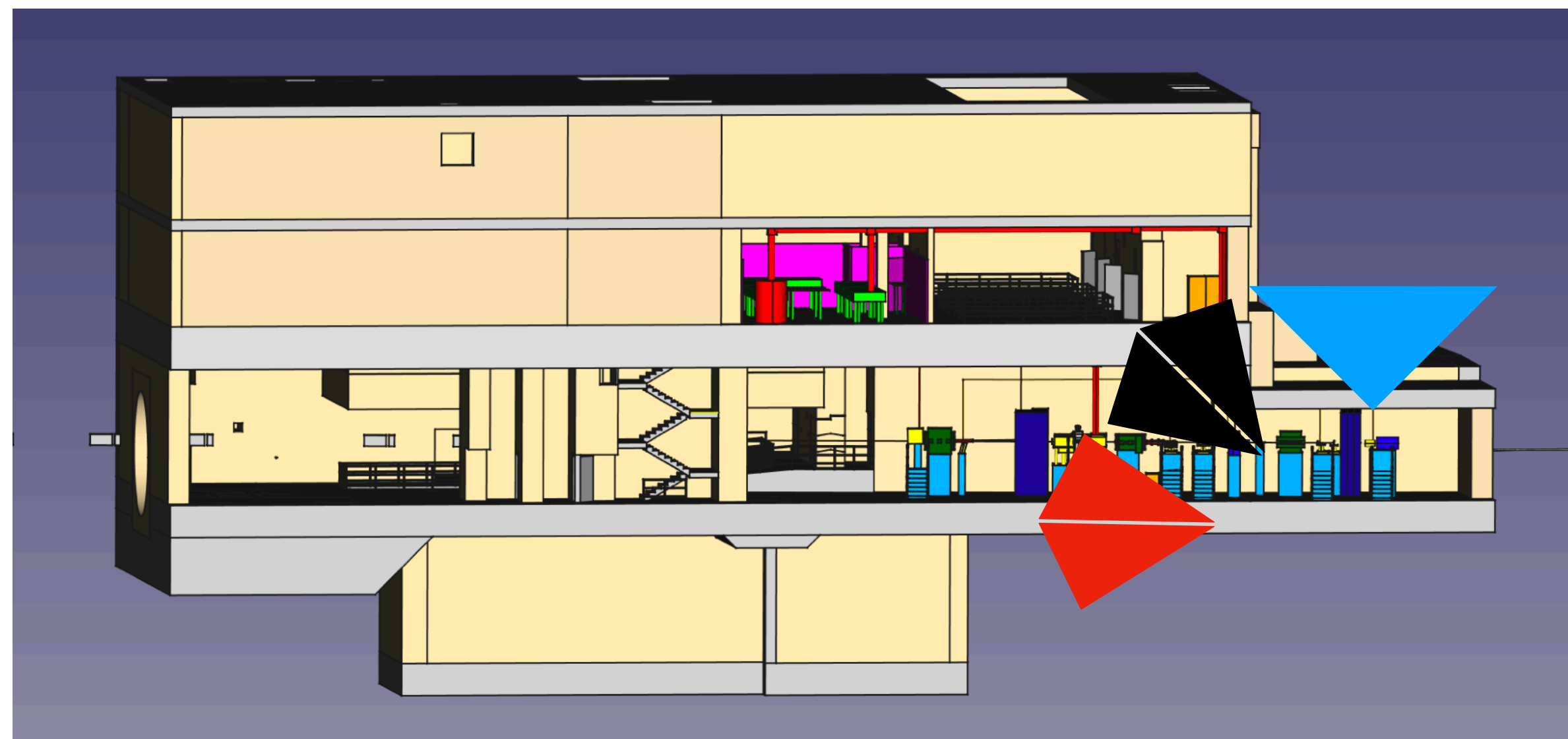

These are the informations we should be able to access from D3(neutron with different energy threshold and gamma from dump).
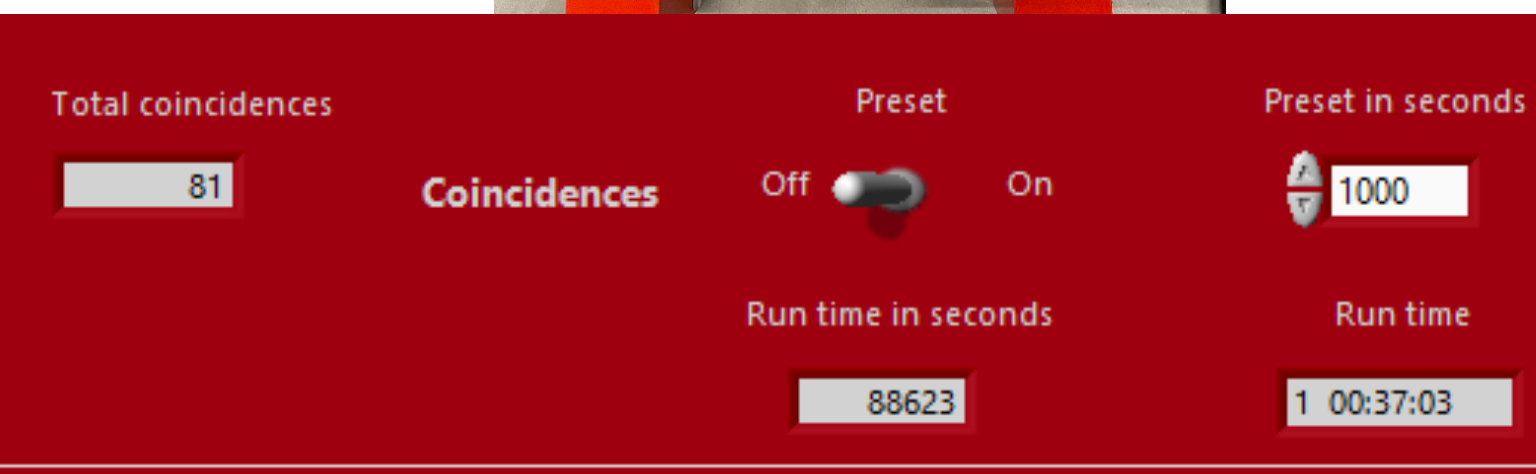
XS1 SETUP

cosmics

±24°

Horizontal

22.5cm

cosmics

vertical

11.2cm

±44°

~±23°

cosmics

45°

So unfortunately solid angle of 3 configuration is quite different.

40 mm

140 mm

100 mm

60 mm

TIME MEASUREMENT AND COUNTS

Horizontal

Coincidences
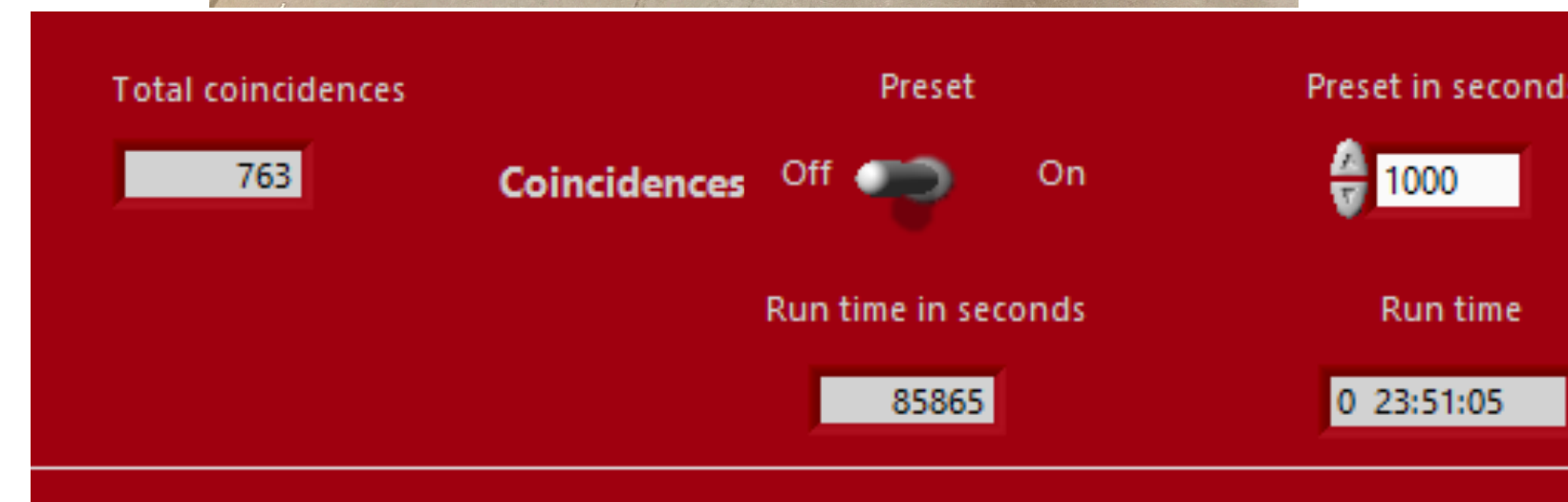| Total coincidences	Preset	Preset in seconds
81	Off / On	1000
	Run time in seconds	Run time
	88623	1 00:37:03

corrected time : total horizontal run: 37min 20s.
(81 coincidence in 2240s -> 0.036+-0.004 cosmics/sec).

vertical

Coincidences
Total coincidences	Preset	Preset in seconds
763	Off / On	1000
	Run time in seconds	Run time
	85865	0 23:51:05
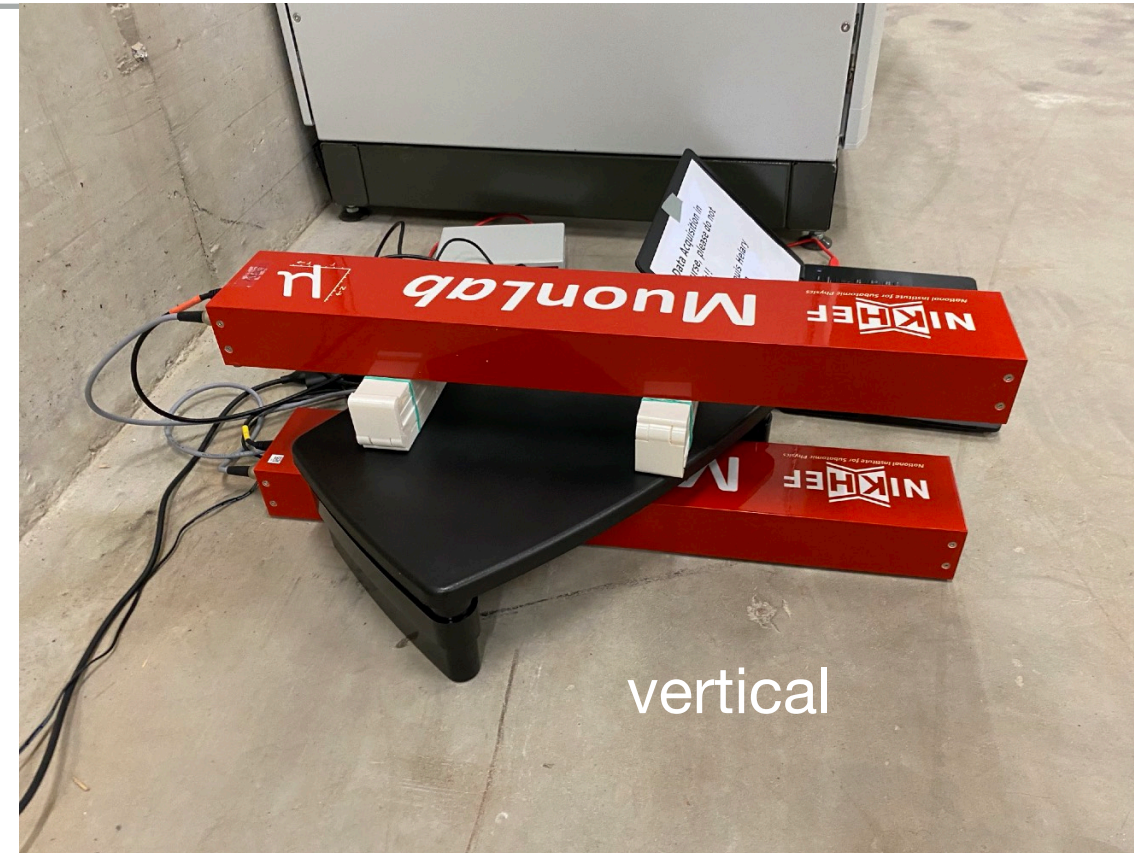
corrected time : total vertical run: 37min 4s.
(763 coincidence in 2224s -> 0.343+-0.013 cosmics/sec).

45°

Coincidences
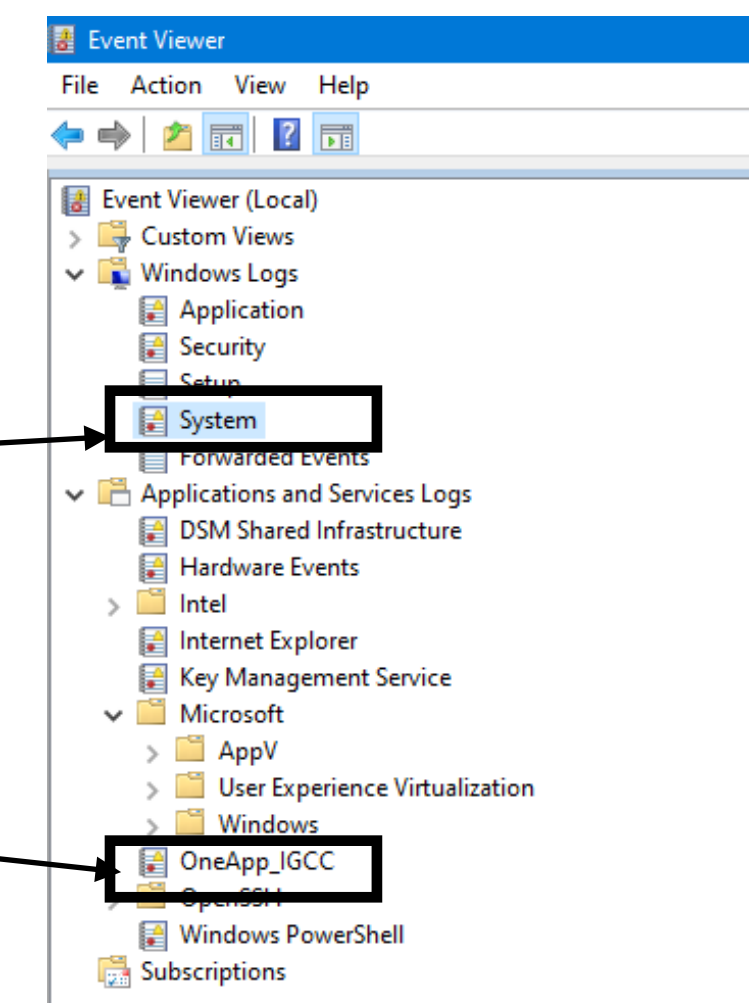| Total coincidences	Preset	Preset in seconds
288	Off / On	1000
	Run time in seconds	Run time
	81486	0 22:38:06
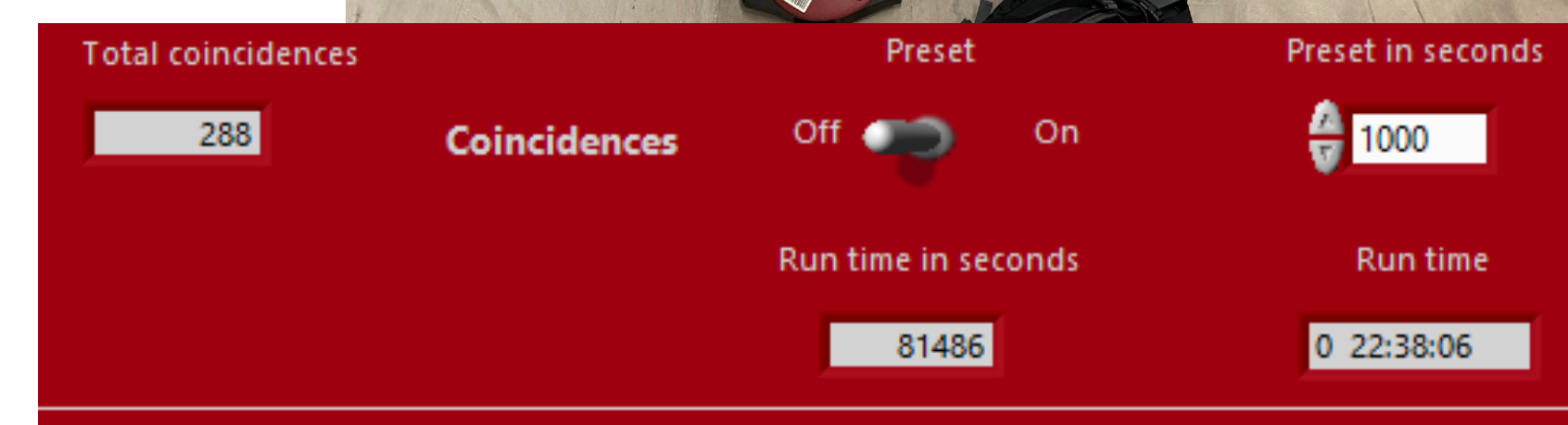
corrected time : total 45 degree run: 32min 33s.
(288 coincidence in 1953s -> 0.147+- 0.008 cosmics/sec)
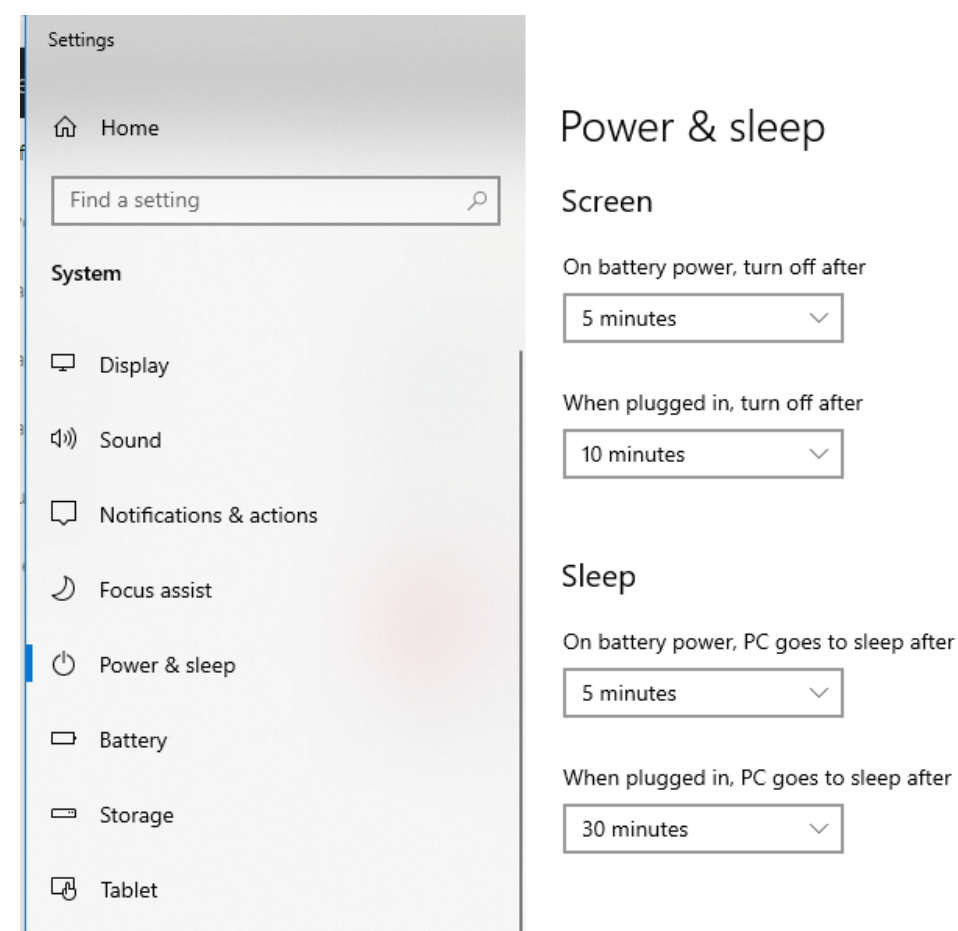
By default windows laptop
goes to sleep after 30min of inactivity even if plugged in…

System log contains time at which computer goes to sleep,
OneApp_IGCC log contains time at which windows woke up.

TIME MEASUREMENT AND COUNTS IN MY OFFICE

Horizontal

Coincidence rate

Total coincidences: 30558
Average number of coinc per sec over run time: 0,12
Coincidences

Start / Stop measurement Coincidence rate
STOP | Running | Reset
Preset: Off — On
Preset in seconds: 1000
Run time in seconds: 246910
Run time: 2 20:35:10

vertical

Coincidence rate

Total coincidences: 10427
Average number of coinc per sec over run time: 1,91
Coincidences

Start / Stop measurement Coincidence rate
STOP | Running | Reset
Preset: Off — On
Preset in seconds: 1000
Run time in seconds: 5464
Run time: 0 01:31:04

45°

Coincidence rate

Total coincidences: 42427
Average number of coinc per sec over run time: 0,65
Coincidences

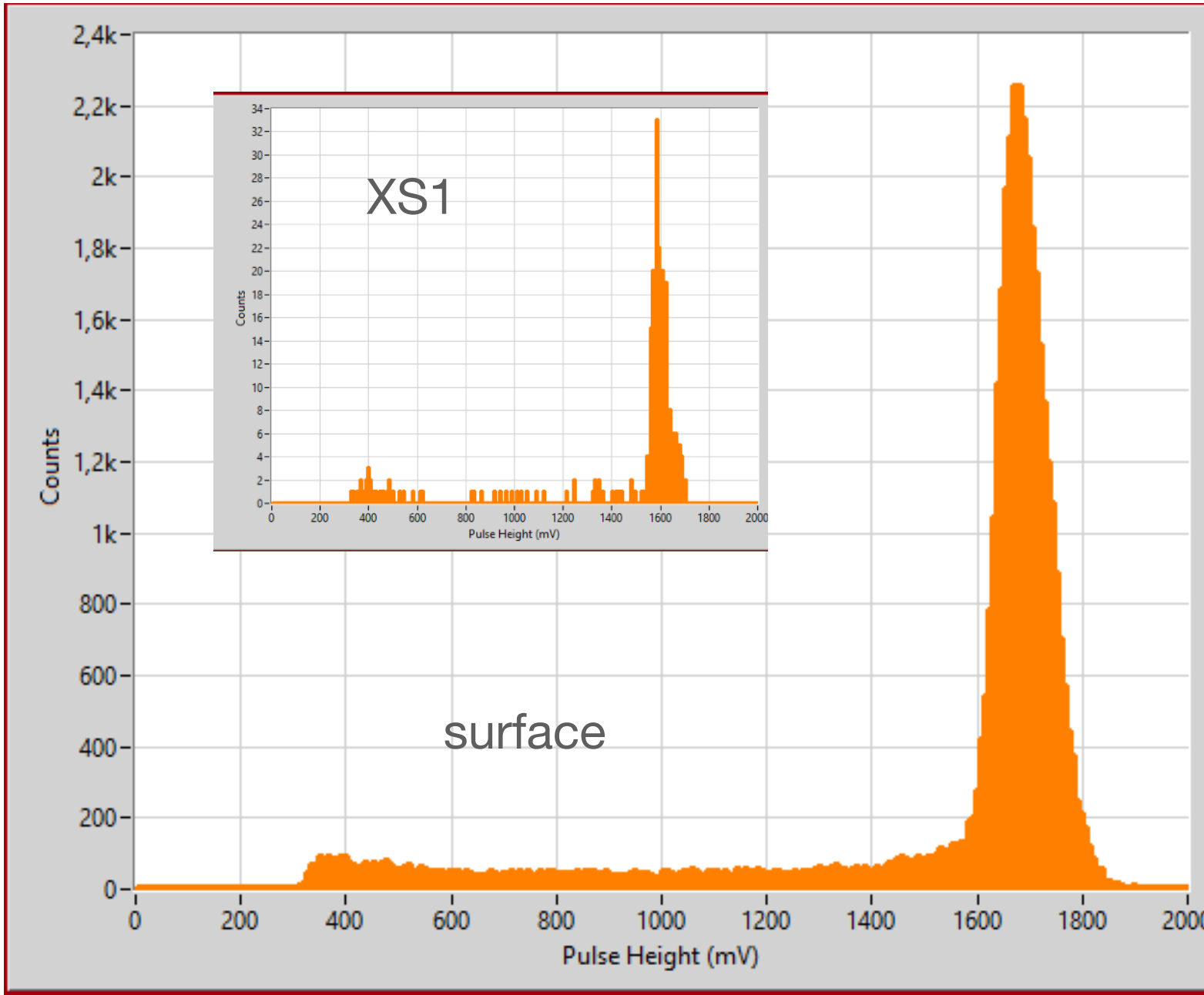Start / Stop measurement Coincidence rate
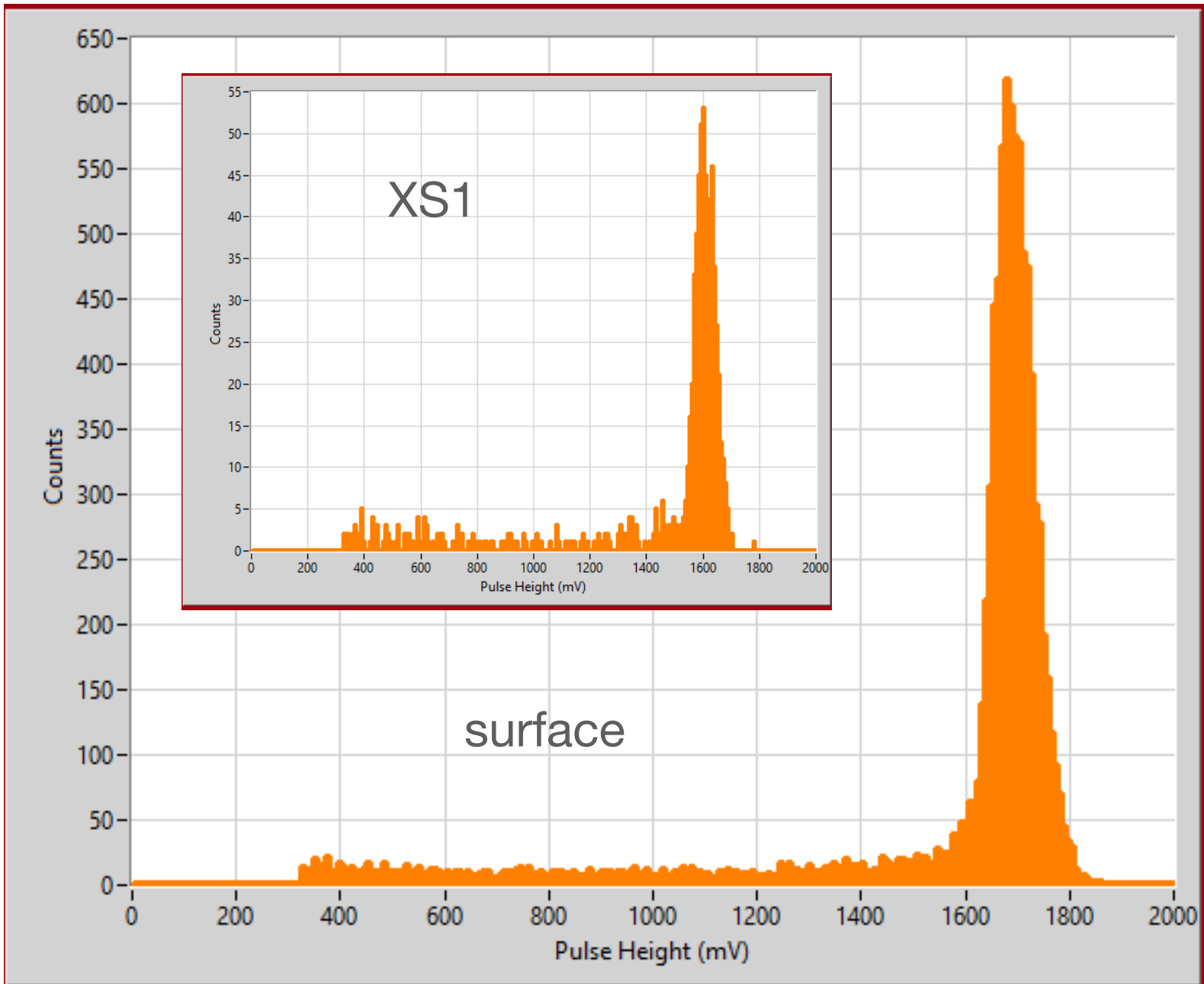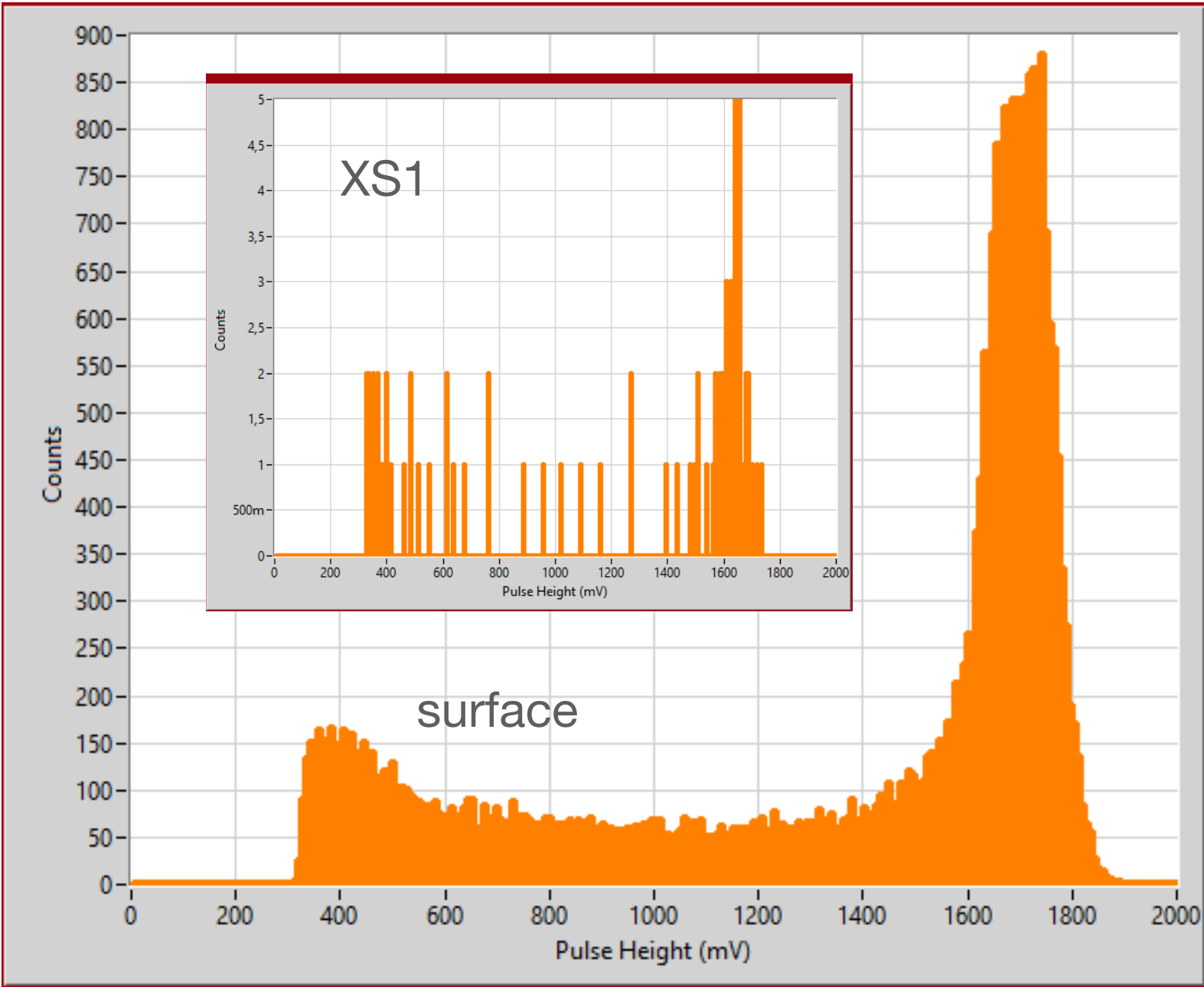STOP | Running | Reset
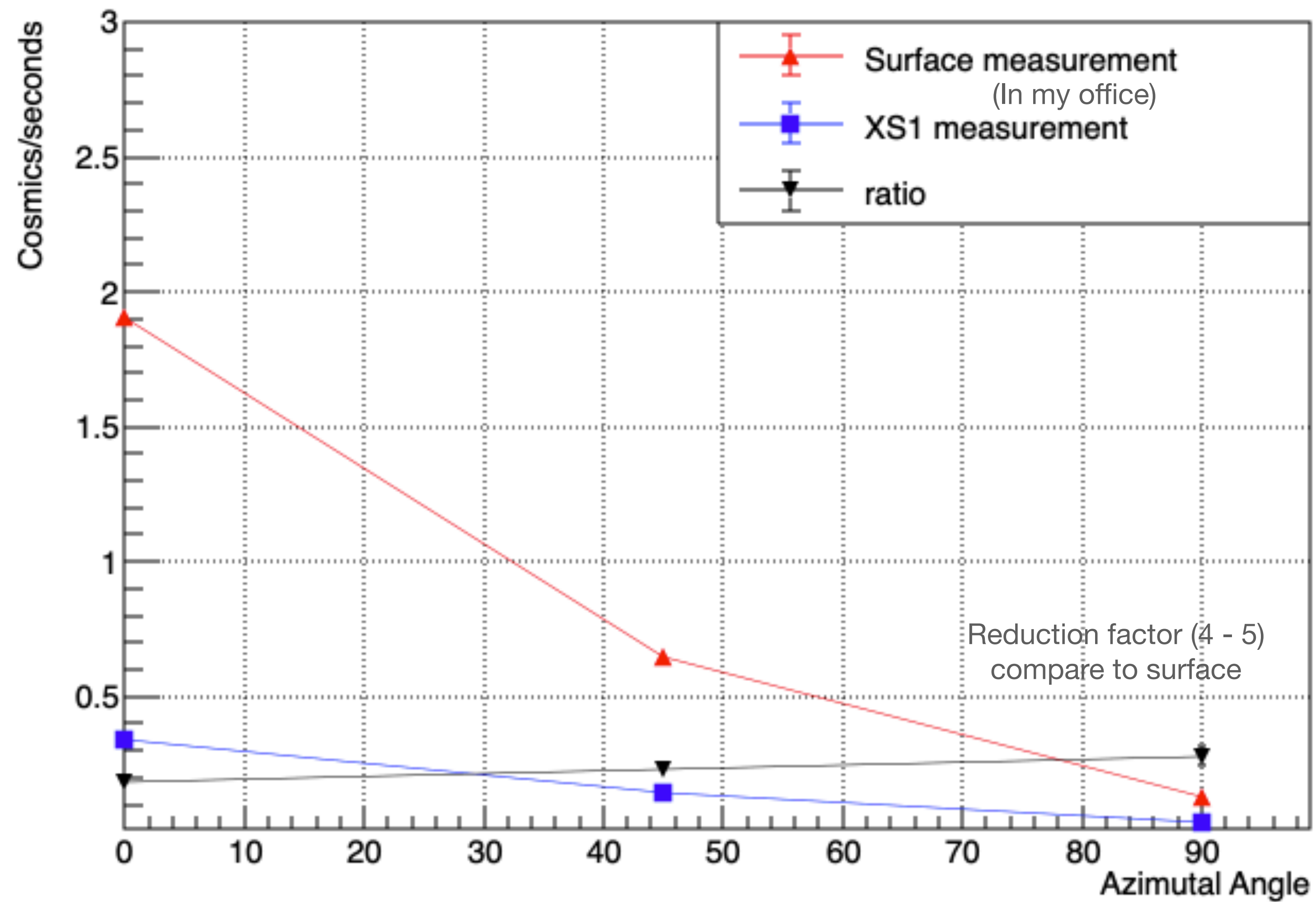Preset: Off — On
Preset in seconds: 1000
Run time in seconds: 65562
Run time: 0 18:12:42

Max height of pulse

RESULT

- Solid angle not taken into account, but configuration similar for surface and undeground point by point.
- Effect of background from pulse not subtracted, but seems to be similar (at least within statistics).