COSMICS IN XS1

LOUIS HELARY (DESY)

LUXE TECHNICAL MEETING - JUNE 30TH 2021

HELMHOLTZ RESEARCH FOR GRAND CHALLENGES





XFEL SUMMER SHUTDOWN

Getting the accesses and dosimeter was relatively easy.

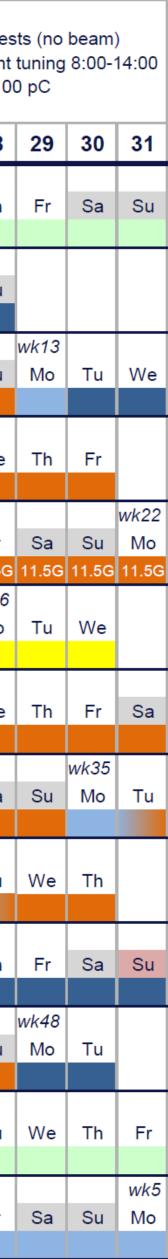
Still did not managed to get transponder..

Sent a mail to Sven Mohr (D5), but no answer so far.

2 weeks access (summer shutdown)

Europ XF	ean EL	0	pe	ra	tic	on	Sc	:he	d	ule	e 2	02	1					ty deve	elopme am (14		250 p	Acces		up, tur		GeV, 1	Exper	ock tes riment eV, 10	t ti
2021	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	
Jan	Fr	Sa	Su	<i>wk1</i> Mo	Tu	We	Th	Fr	Sa	Su	wk2 Mo	Tu	We	Th	Fr	Sa	Su	wk3 Mo	Tu	We	Th	Fr	Sa	Su	<i>wk4</i> Mo	Tu	We	Th	I
	wk5 Mo	Tu	We	Th	Fr	Sa	Su	<i>wk6</i> Mo	Tu	We	Th	Fr	Sa	Su	<i>wk7</i> Mo	Tu	We	Th	Fr	Sa	Su	<i>wk8</i> Mo	Tu	We	Th	Fr	Sa	Su	Ī
Feb	wk9 Mo	Tu	We	Th	Fr	Sa	Su	<i>wk10</i> Mo	Tu	We	Th	Fr	Sa	Su	<i>wk11</i> Mo	Tu	We	Th	Fr	Sa	Su	wk12 Mo	Tu	We	Th	Fr	Sa	Su	V
March	1																												Ļ
Apr	Th	Fr	Sa	Su	wk14 Mo	Tu	We	Th	Fr	Sa	Su	wk15 Mo	Tu	We	Th	Fr	Sa	Su	wk16 Mo	Tu	We	Th	Fr	Sa	Su	wk17 Mo	Tu	We	
	Sa	Su	wk18 Mo	Tu	We	Th	Fr	Sa	Su	wk19 Mo	Tu	We	Th	Fr	Sa	Su	wk20 Mo	Tu	We	Th	Fr	Sa	Su	wk21 Mo	Tu	We	Th	Fr	
Мау	Tu	We	Th	Fr	Sa	Su	wk23 Mo	Tu	We	Th	Fr	Sa	Su	wk24 Mo	Tu	We	Th	Fr	Sa	Su	v∕k25 Mo	Tu	We	Th	Fr	11.5G Sa	Su	wk26 Mo	-
June		11.5G	11.5G	11.5G	11.5G wk27	11.50																				wk30			4
July	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	<i>wк28</i> Мо	Tu	We	Th	Fr	Sa	Su	<i>wк29</i> Мо	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	
0	Su	wk31 Mo	Tu	We	Th	Fr	Sa	Su	wk32 Mo	Tu	We	Th	Fr	Sa	Su	<i>wk33</i> Mo	Tu	We	Th	Fr	Sa	Su	wk34 Mo	Tu	We	Th	Fr	Sa	
Aug	We	Th	Fr	Sa	Su	<i>wk36</i> Mo	Tu	We	Th	Fr	Sa	Su	wk37 Mo	Tu	We	Th	Fr	Sa	Su	wk38 Mo	Tu	We	Th	Fr	Sa	Su	<i>wk3</i> 9 Mo	Tu	Ī
Sept	we			wk40	Gu	1010	Tu	we			wk41	Gu	1010	Tu	we			wk42	J	1010	Tu	we			wk43	Gu	1010		
Oct	Fr	Sa	Su	Мо	Tu	We	Th	Fr	Sa	Su	Мо	Tu	We	Th	Fr	Sa	Su	Мо	Tu	We	Th	Fr	Sa	Su	Мо	Tu	We	Th	
Nov	wk44 Mo	Tu	We	Th	Fr	Sa	Su	wk45 Mo	Tu	We	Th	Fr	Sa	Su	wk46 Mo	Tu	We	Th	Fr	Sa	Su	wk47 Mo	Tu	We	Th	Fr	Sa	Su	ľ
Dec	We	Th	Fr	Sa	Su	wk49 Mo	Tu	We	Th	Fr	Sa	Su	wk50 Mo	Tu	We	Th	Fr	Sa	Su	wk51 Mo	Tu	We	Th	Fr	Sa	Su	wk52 Mo	Tu	
Jan 2022	Sa	Su	wk1 Mo	Tu	We	Th	Fr	Sa	Su	wk2 Mo	Tu	We	Th	Fr	Sa	Su	wk3 Mo	Tu	We	Th	Fr	Sa	Su	<i>wk4</i> Mo	Tu	We	Th	Fr	



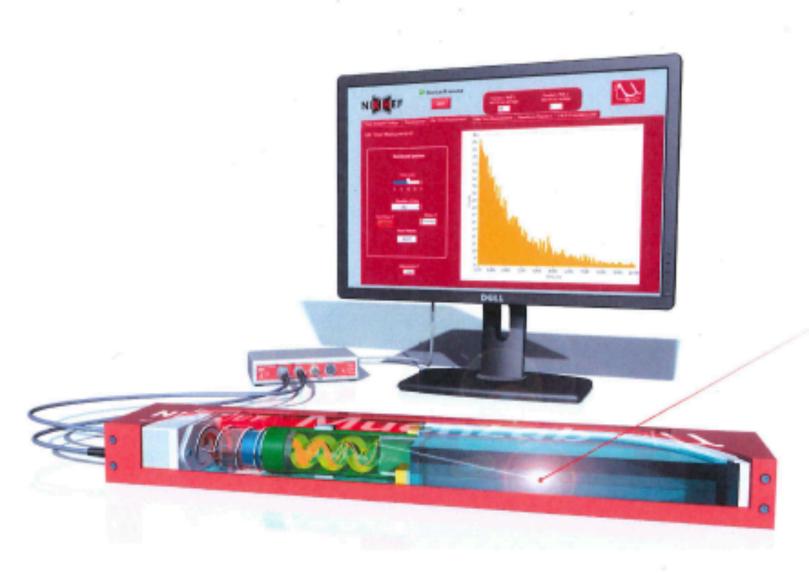




MuonLab

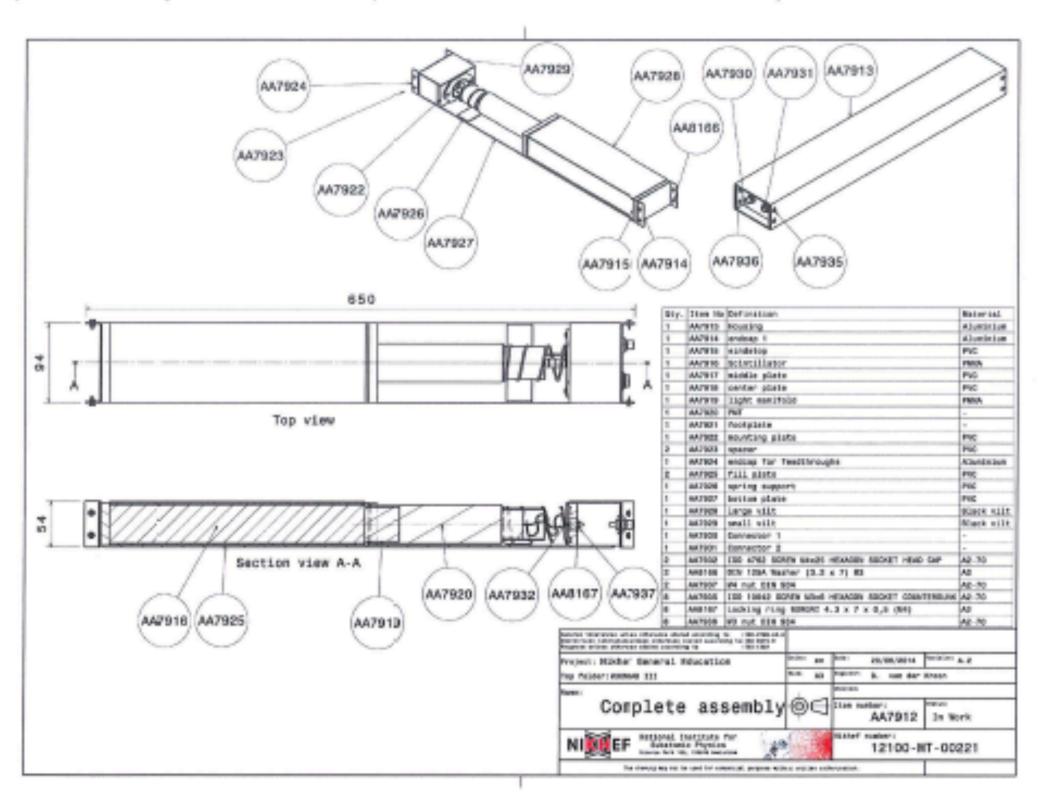
Tabletop instrument for hands-on experiments on muons and electrons

Nikhef Science Park 105 1098XG Amsterdam 020-592 5015 june 2014



Detectors:

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



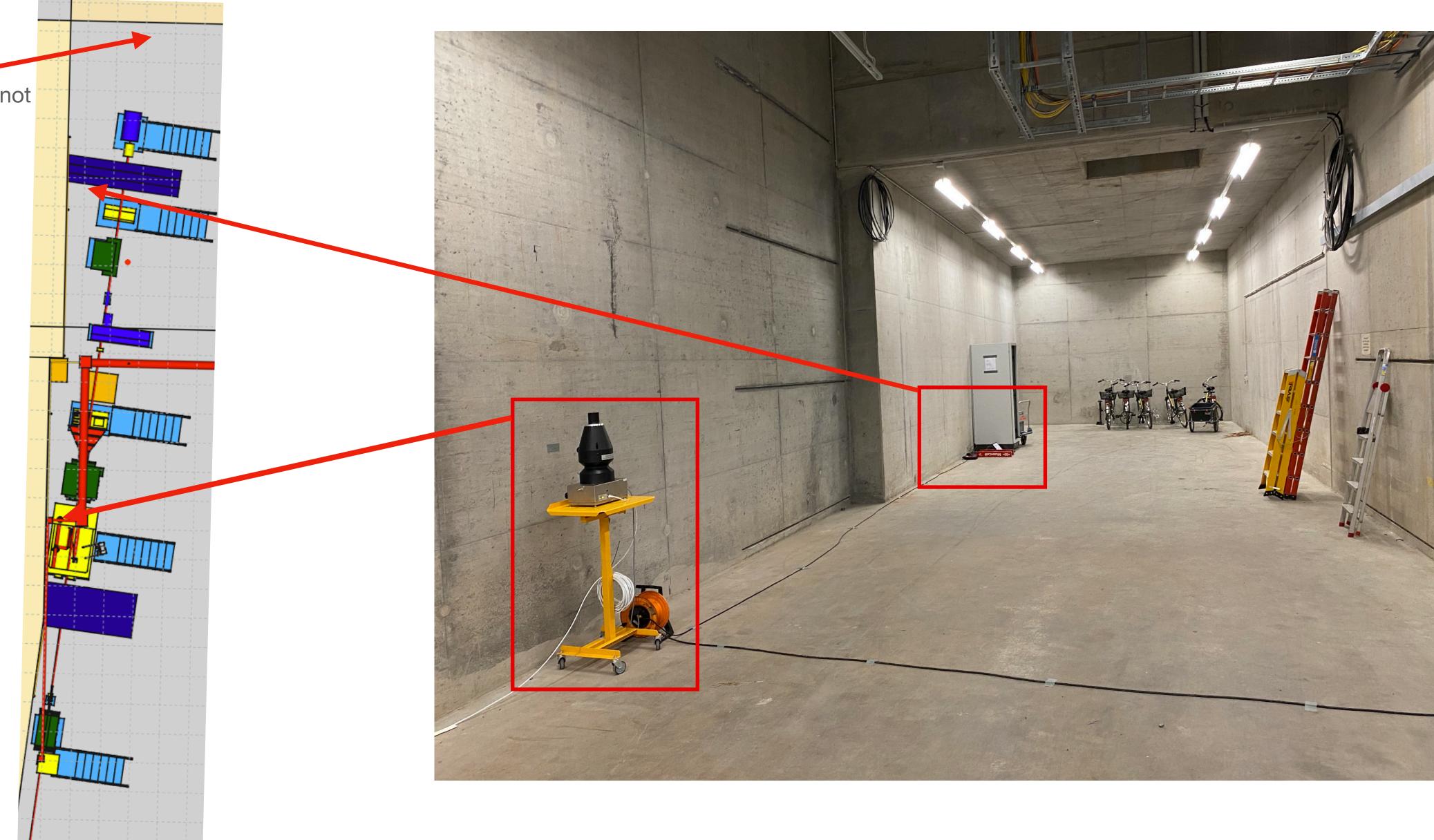
Rather simple to use, but challenging to make it work (needed a 32 bit labview version,)

Plastic scintillator 30 x 9 x 5 cm3 (with PMT R580) or 40 x 9 x 5 cm3 (with PMT R6094) Photomultiplier Hamamatsu R580 or Hamamatsu R6094



WHERE ARE THE DETECTORS?

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

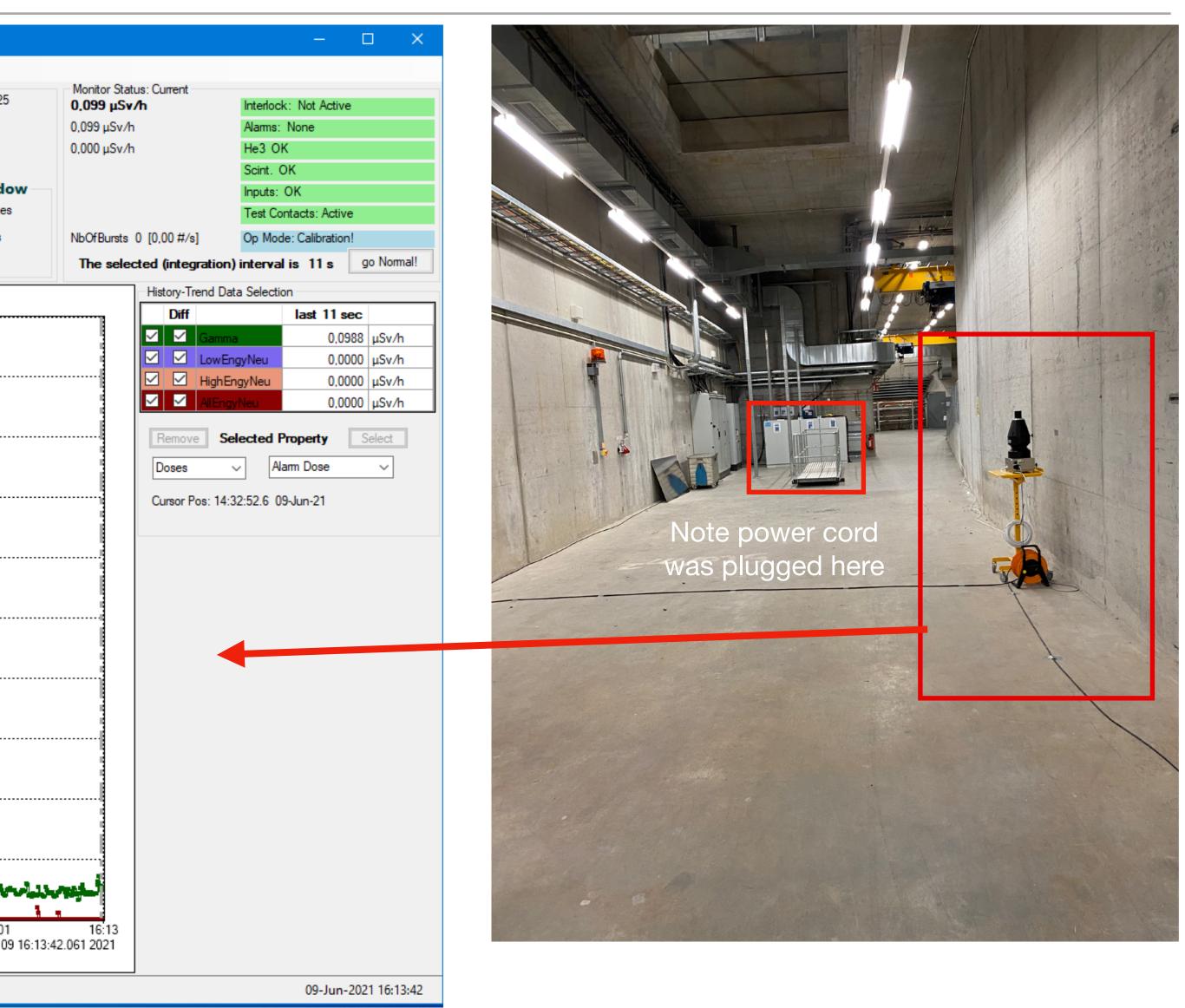




SIDE NOTE NEUTRON DETECTOR

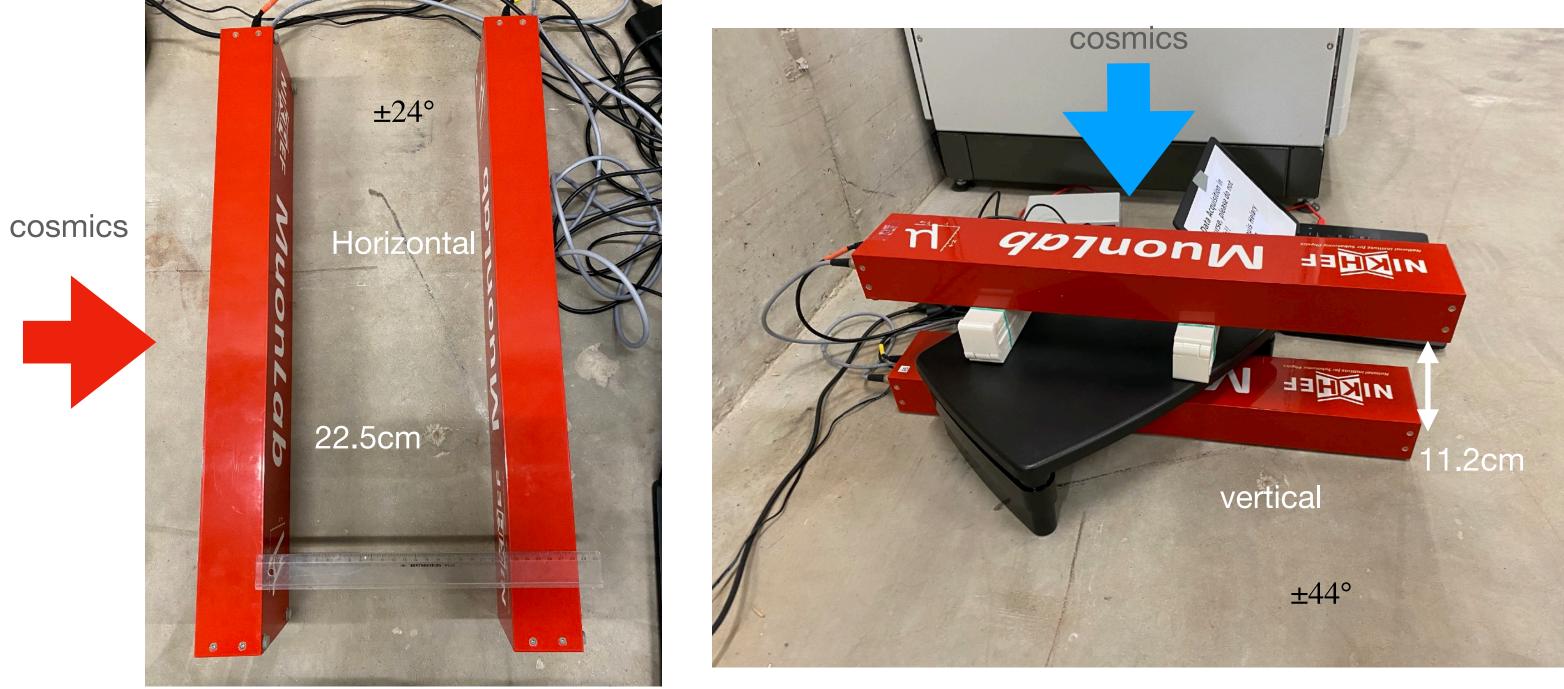
🐹 Pi	ulsed	d-Radiation Monitori	ing XFEL-DarkCu	irrent and Main [Dump Vac									
Print	ing	Location Groups	Monitor Conn	ection- and Con	nfig-Info! I	Measurem	ent Data-B	locks!	Display Optio	ons Expert	Options	Export Data	Help (?)	
0	DC-0	election 04 : SASE3 Cell 15 289 05 : XTL RF Station A6			<u> </u>	Selection - Energy + Spectra	Time	□ Y A	y-Trend Plottir Autoscale Autoscale	Relative	Scaling (0-10 data value (o		Displaye	ed Points: 225
0 (0 (0C-0 DC-0	06 : Dump Kicker Schr 07 : Dump Kicker Schr	164 1960m aussen 164 1960m	I		Operatio History	ns		YMax	Fix Y-Mir	n = 0 History Plot			ory Winde
DC-008 : XS1 XTD20 LUXE DC-009 : XS1 Dump Vakuum 2131m					Live Data		Start- and Stop-Times of Integration Interval					20 ÷ O minute 2 ÷ O hours		
Data Received: 16:13:42.00 09-Jun-21 Update Interval: 2,0 sec			• 0	Archive	•	Start: 16:13:31.99 09-Jun-21 Int. Interval Stop: 16:13:42.06 09-Jun-21 11 sec								
Jata		100.10.10.12.00 000		101701. 2,0 000			History of	XS1 X	TD20 LUXE					
	2													
	1,8-													
	1.6-													
	1,4-													
(e	1,2-			-										
Gamma (µSv/h)	1-													
Gar	0.8-													
	0.6-													
	0.4													
	0.4													
	0.2											- Arriver		ومحرواتهم
	0 4 2 H		5 14	1:37	14:49	15:	01	15:	13	15:25	15:3	37	15:49	16:01 Jun 0
1	Print	🕅 贅 🚾	D03WIN62 Aco	p.net 3.5.5										

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

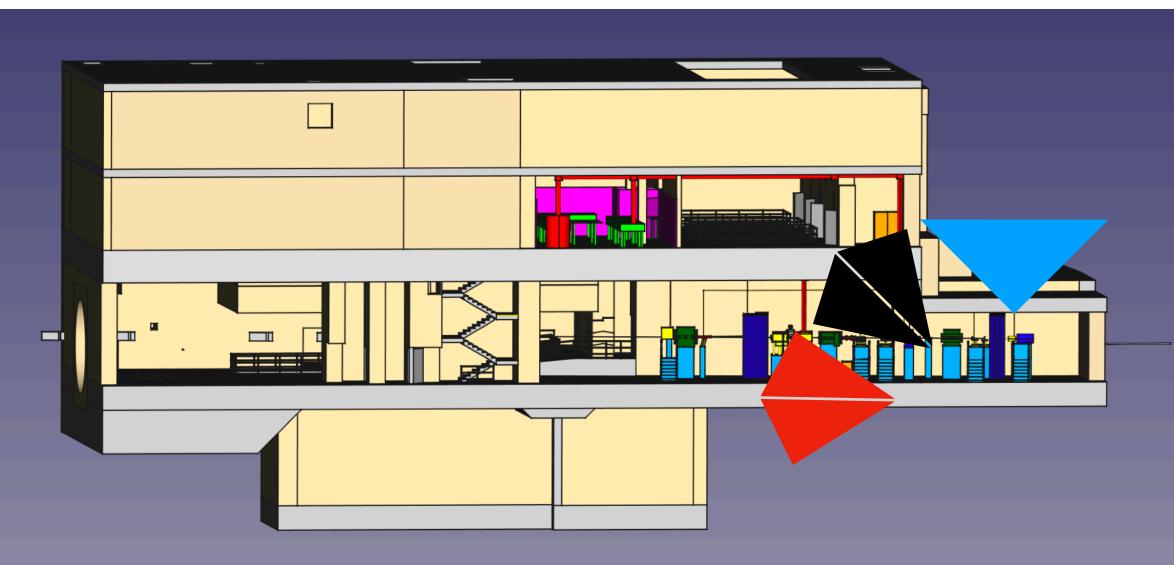


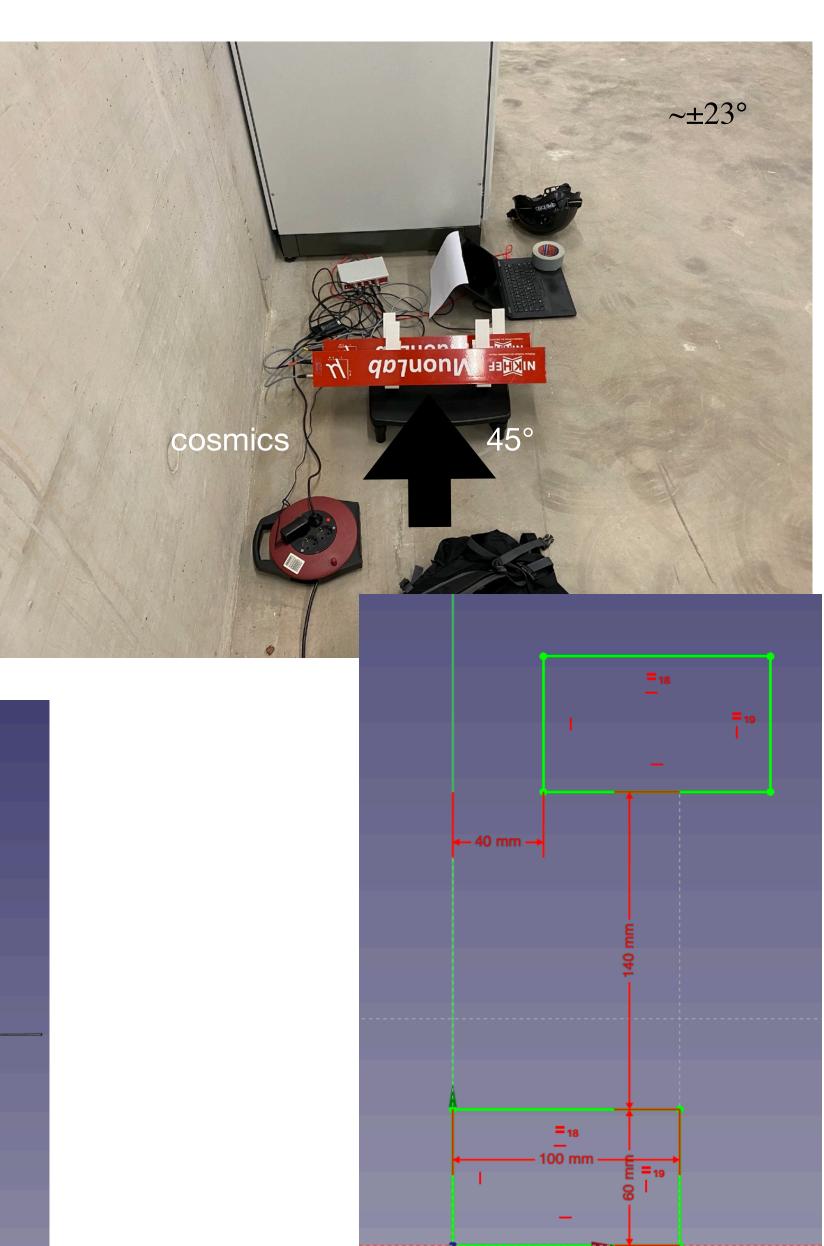


XS1 SETUP



So unfortunately solid angle of 3 configuration is quite different.









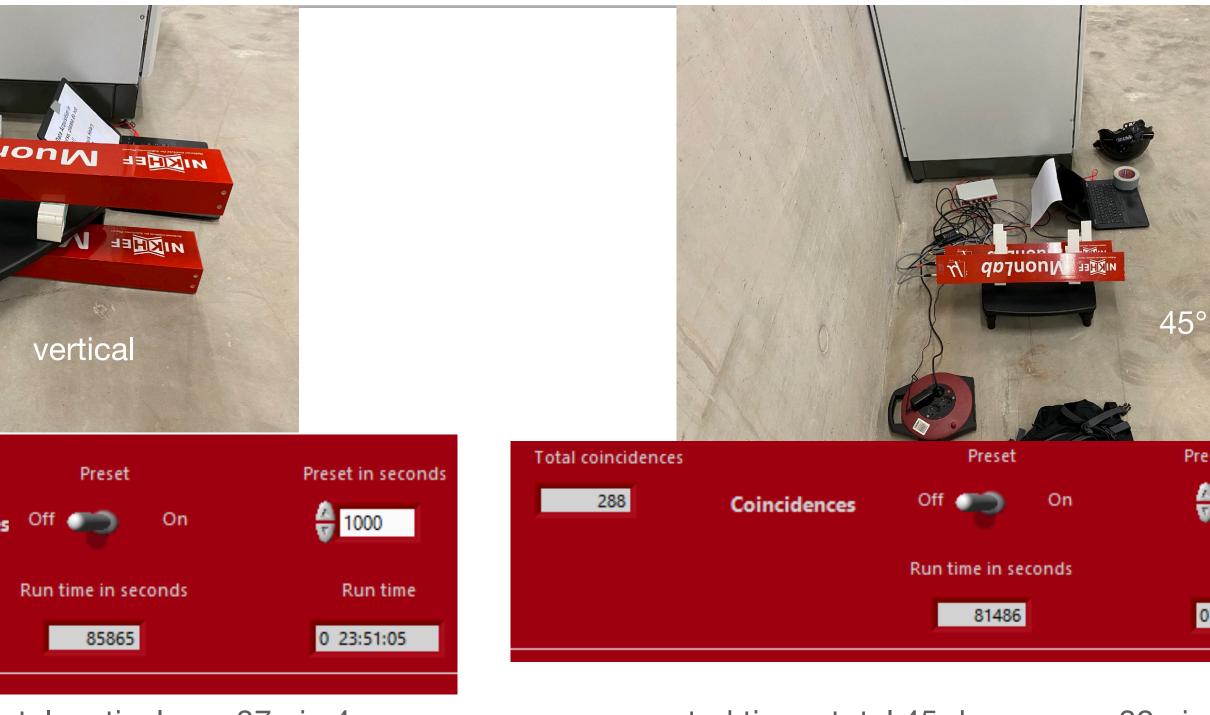
TIME MEASUREMENT AND COUNTS

	Muontab				
Total coincidences		Preset	Preset in seconds	Total coincidences	Coincidence
81	Coincidences	Off 🌍 On	1000	105	Coincidence
		Run time in seconds	Run time		
		88623	1 00:37:03		

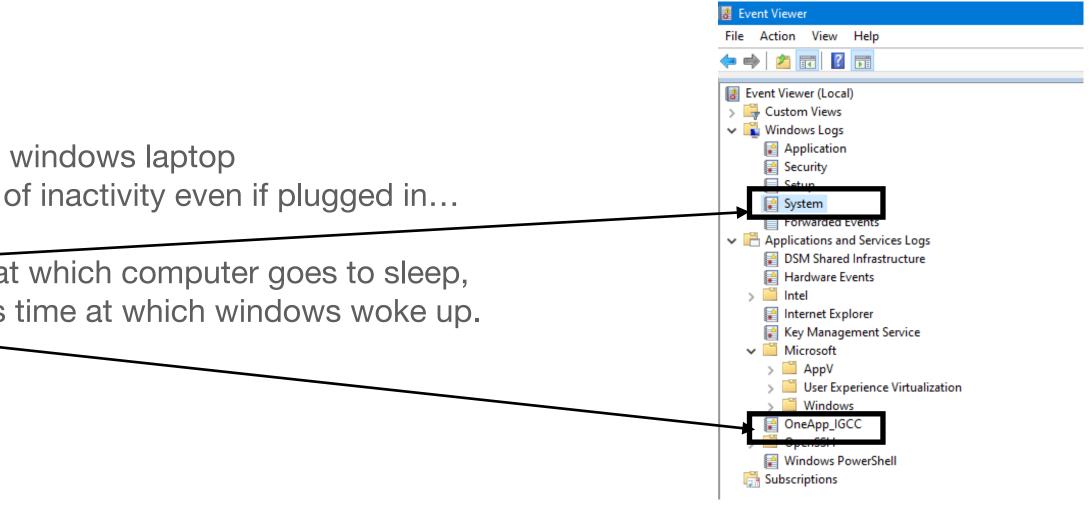
corrected time : total horizontal run: 37min 20s. (81 coincidence in 2240s -> 0.036+-0.004 cosmics/sec).

corrected time : total vertical run: 37min 4s. (763 coincidence in 2224s -> 0.343+-0.013 cosmics/sec).

Settings		
යි Home	Power & sleep	
Find a setting		
System	On battery power, turn off after	By default
🖥 🖵 Display	When plugged in, turn off after	goes to sleep after 30min o
⁹	10 minutes V	
, 💭 Notifications & actions		System log contains time a
J Focus assist	Sleep	OneApp_IGCC log contains
🖒 Power & sleep	On battery power, PC goes to sleep after	
□ Battery	When plugged in, PC goes to sleep after	
📼 Storage	30 minutes V	
- Tablet		



corrected time : total 45 degree run: 32min 33s (288 coincidence in 1953s -> 0.147+- 0.008 cosmics/sec)

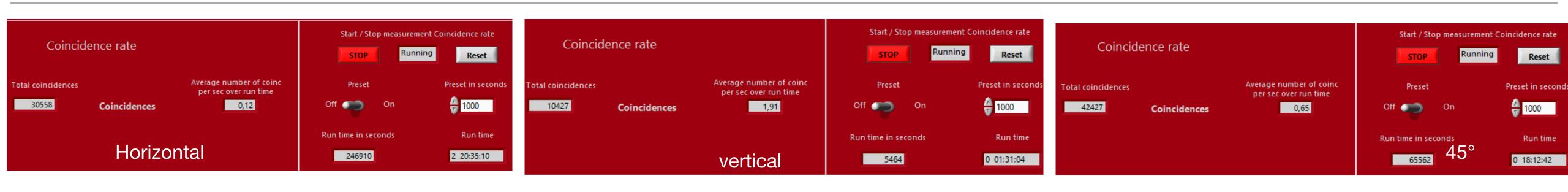


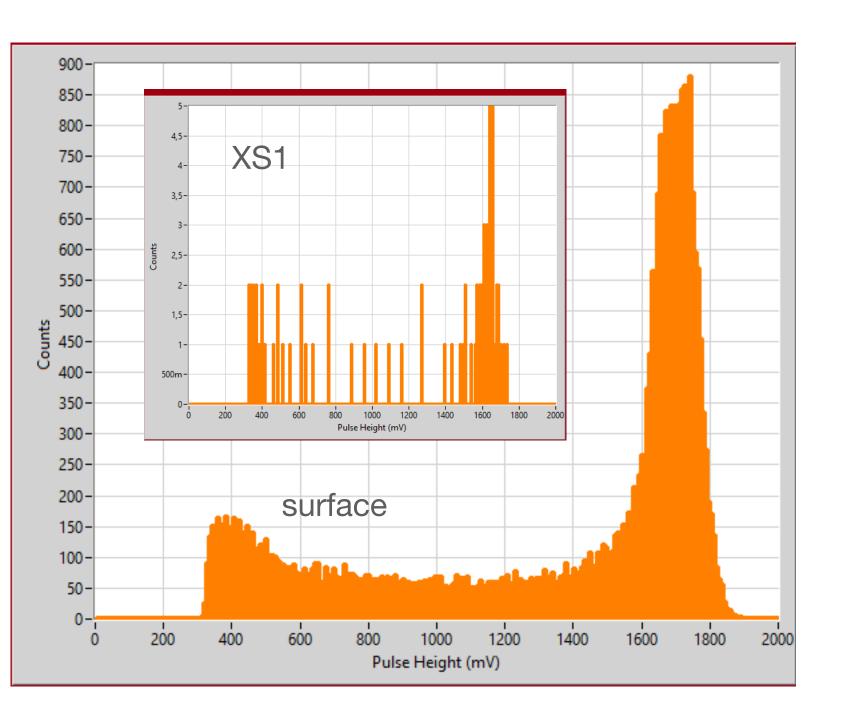


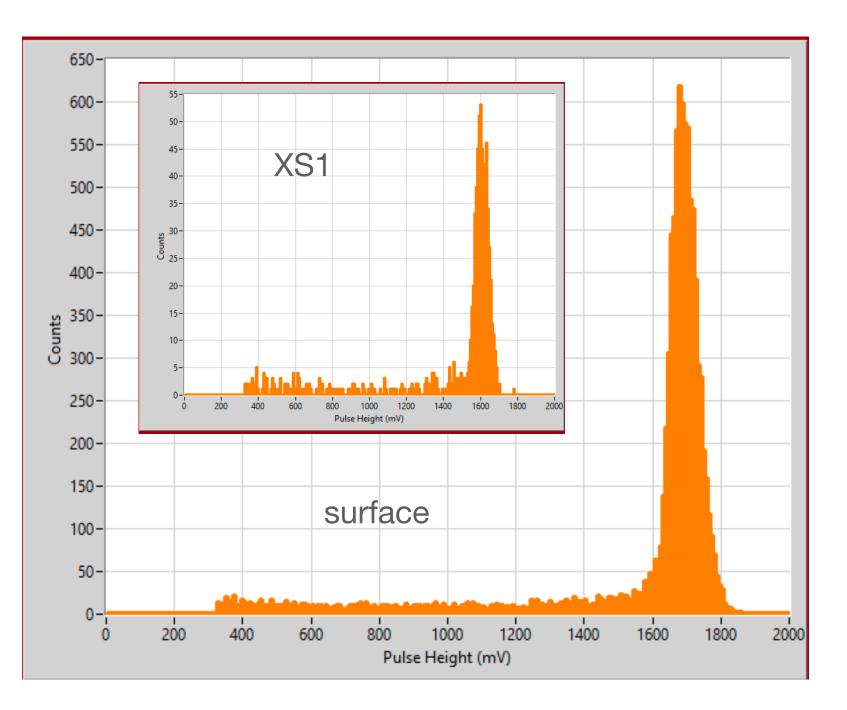
7



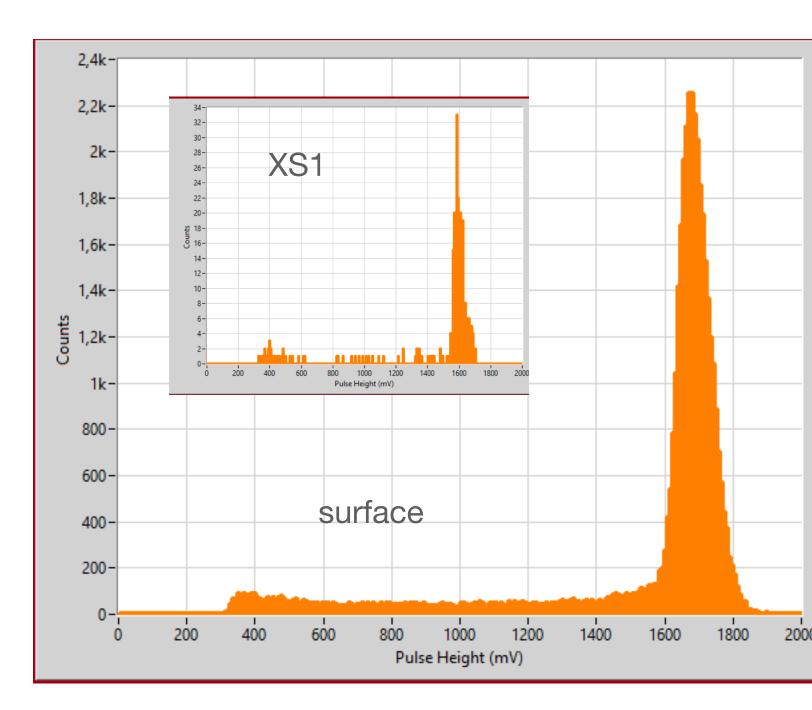
TIME MEASUREMENT AND COUNTS IN MY OFFICE





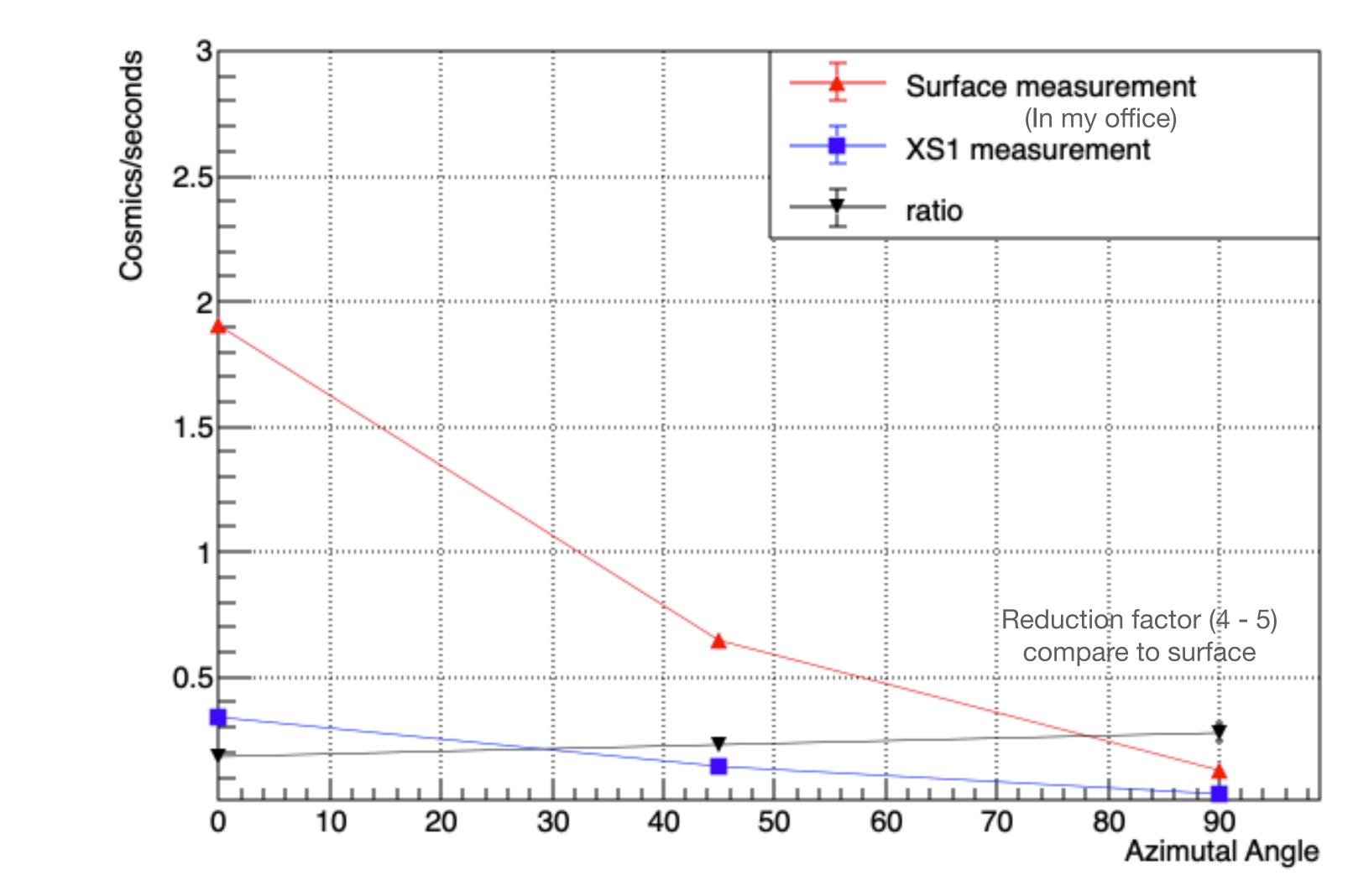


Max height of pulse





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).

nd undeground point by point. (at least within statistics).

