Technical commissioning report

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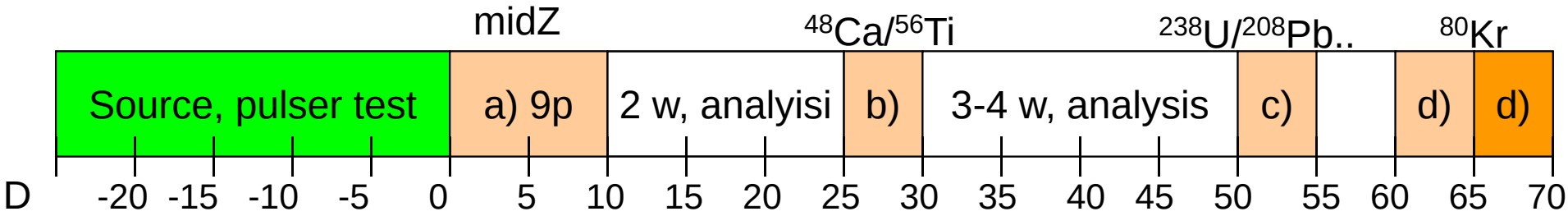
On behalf of the AGATA collaboration

AGATA@PRESPEC commissioning planning, ver: nov 2011

Unit : 5 days, p means parasitic, d means full beam, w means week

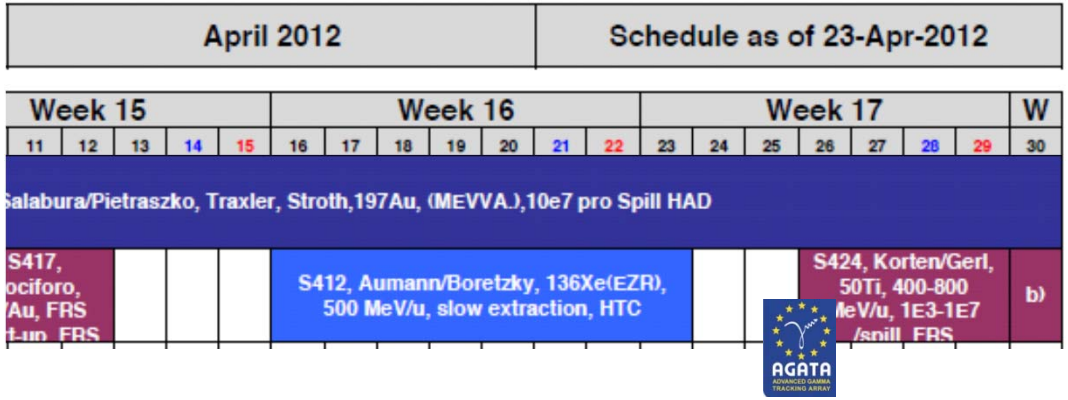
- parasitic beam time request
- main beam time request
- source tests (need the full setup running so all things mounted)



a) General technical commissioning of all the subsystems separate and together, first files for analysis, any mid Z beam could do it
b) Proton knock out run with light nuclei, simple case to analyze, need 48Ca or 56Ti
c) Second. Target/second. beam combination systematic study to know if Pb background is needed, utmost importance for determining best running conditions for the main experiments
d) Performance commissioning, need 80Kr, two target distances, nucleon knock out and coulex (two different secondary target), need enough statistic to study Pulse Shape Analysis in crystals under FRS condition

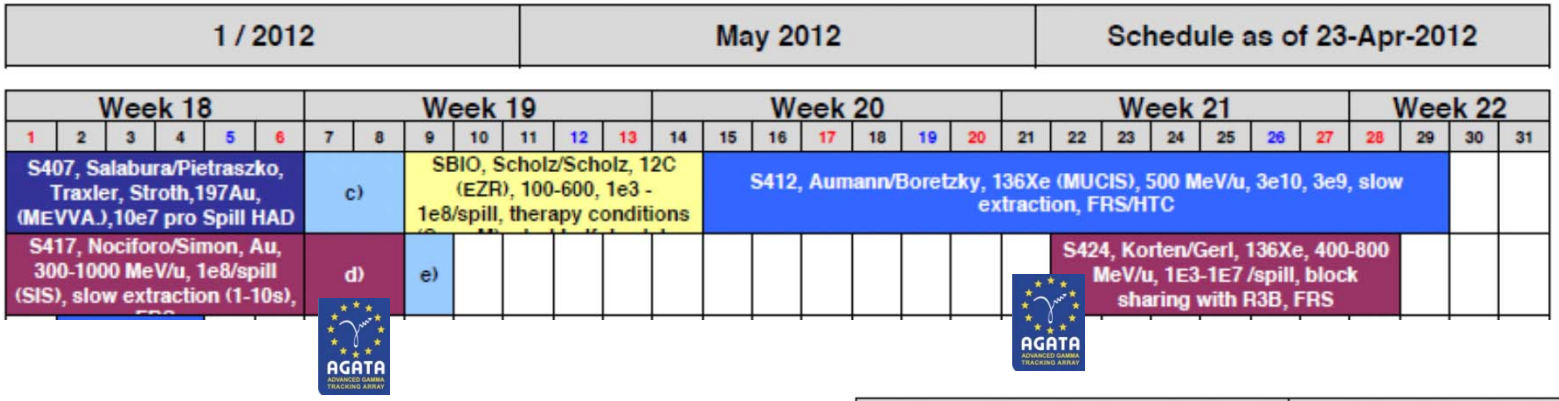
It it nice to have a plan… but

Time planning commisioning

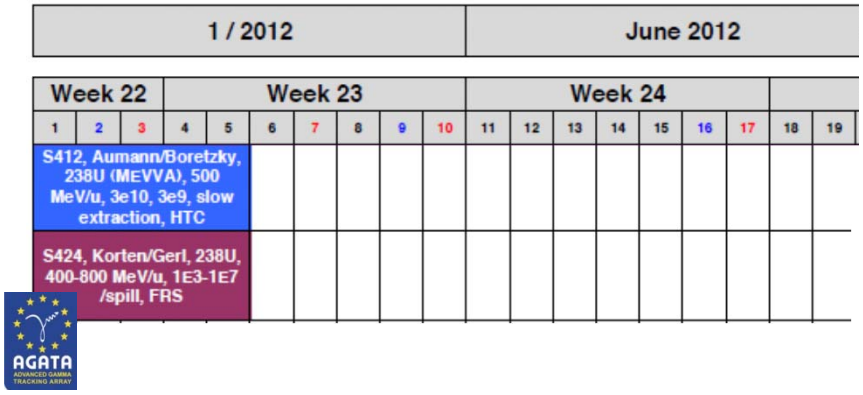


Not to bad ➔ except we could not test the system so much before hand!

Two hours of beam time per day



Light blue was using FRS too so we had to update routinely the PRESPEC DAQ depending on their needs and our needs!



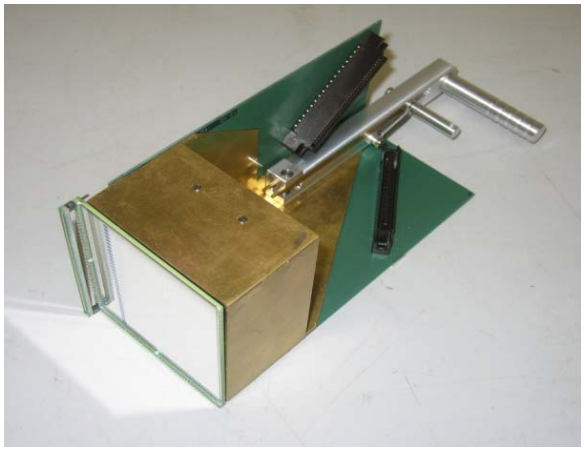
Upgrade PRESPEC to commission

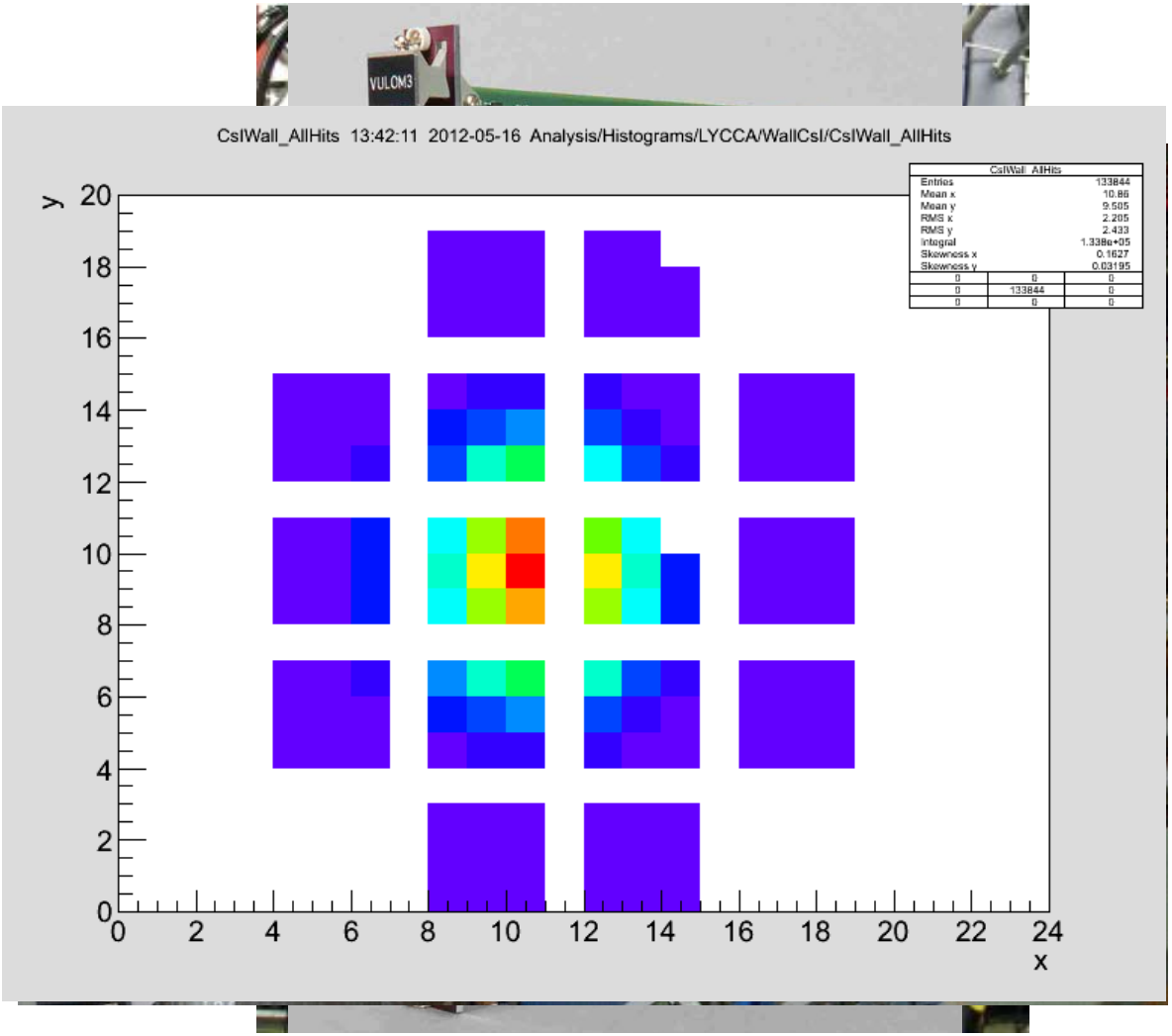
New trigger module TRLO

New LYCCA start plastic

New cabling of LYCCA

New LYCCA modules





Technical commissioning main concern

PRESPEC readout 10 VME crates

Need fast (1us) gate generation

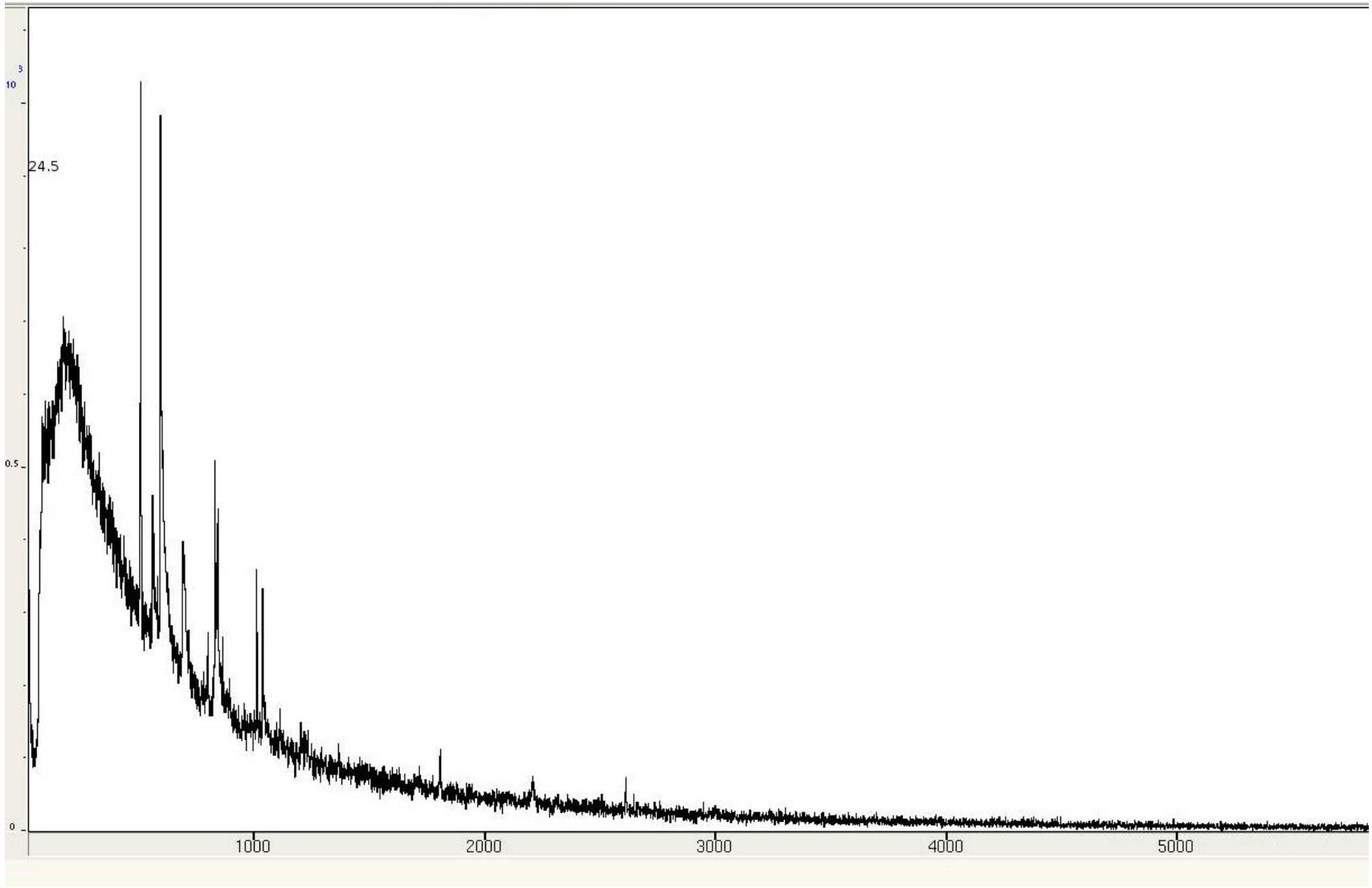
GTS (AGATA trigger) give validation in ~ 10 us ➔ too slow

➔We did like in Italy ➔ analogue output of digitizer used as analogue trigger for the PRESPEC electronic and request validation to AGATA.
➔This means we build the particle-gamma coincidence outside the GTS.

➔Dead time is given by the VME electronic (limit few kHz accepted trigger)

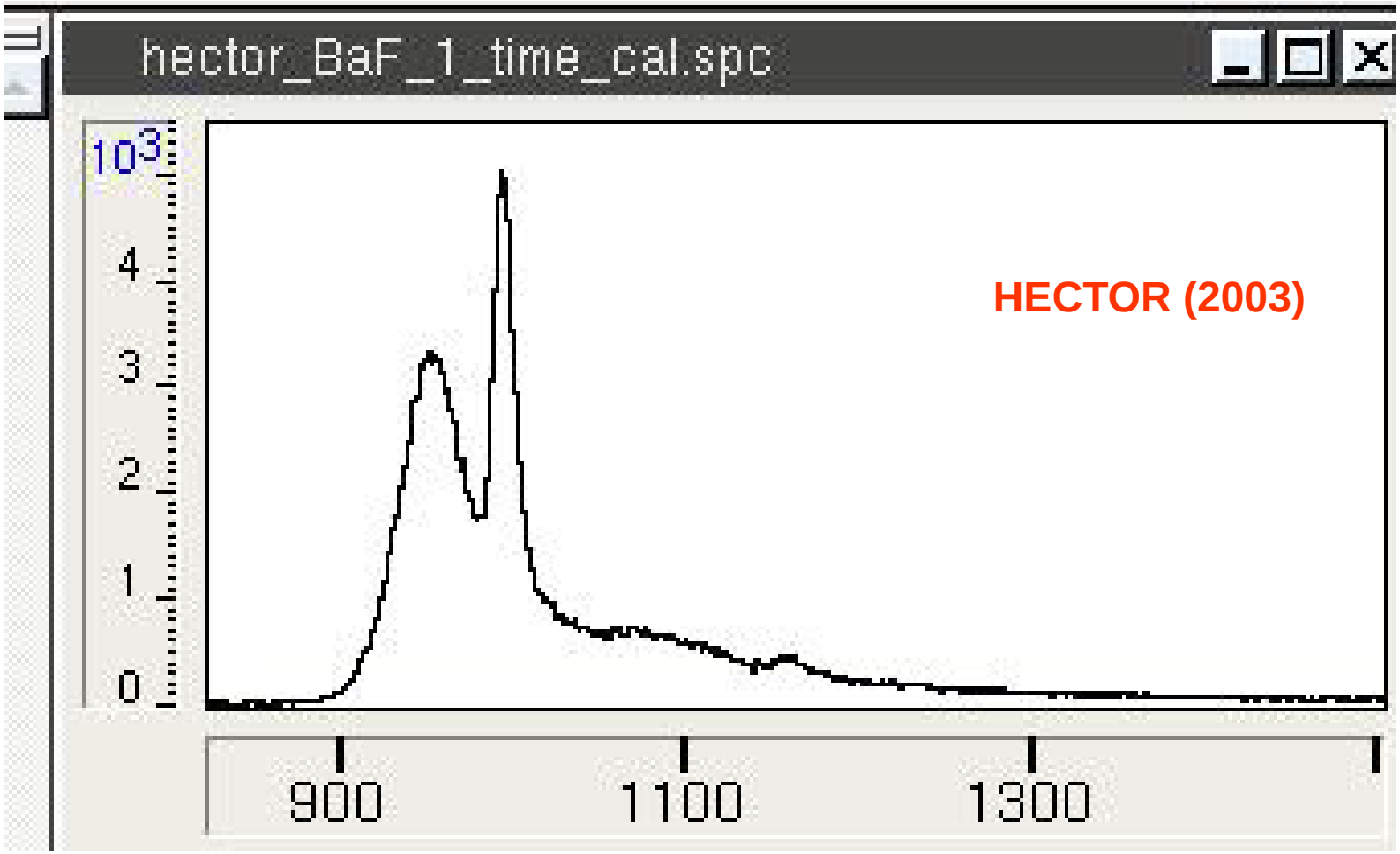
➔X-ray Lorentz boosted from around the target will fire the particle-gamma trigger ➔ usually we have a huge background in such experiment

Challenging experiments… lots of background



On line PRESPEC spectra of a successful 2011 experiment!!

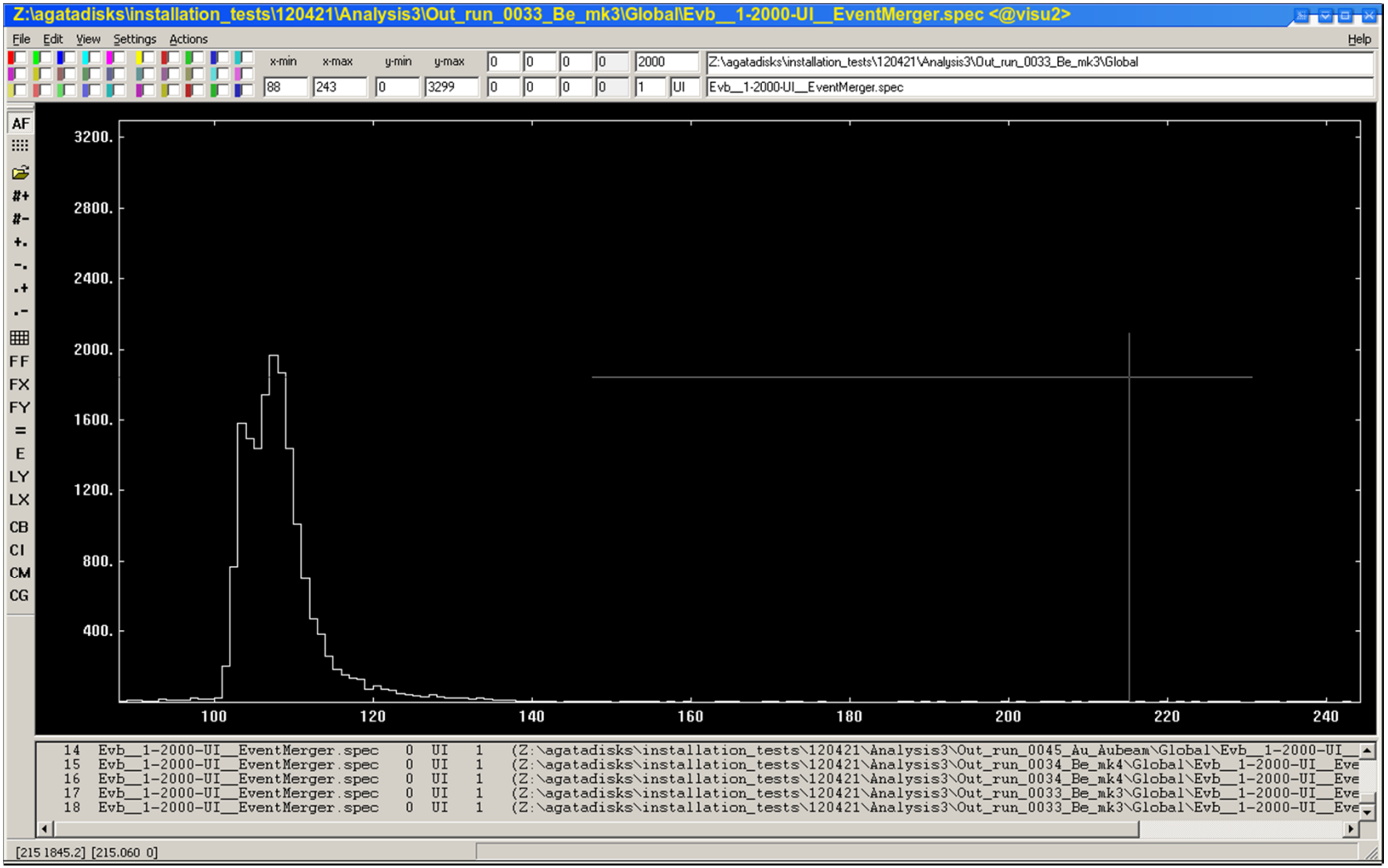
Time spectra to see the target



See L. Cortes and O. Wieland presentations

➔ If we see the contribution in time of the target we know the gates are okay

Actually we had it in merging the data!!



Time stamp difference between AGATA and FRS after merging

Technical commissioning goals

Debug new TRLO PRESPEC system	➔**Done**
Test new electronic and detectors for LYCCA	➔**Done**
Use hector to locate time wise the target	➔**Done**
Test AGAVA coupling PRESPEC/AGATA	➔**Done**
Test data flow merging	➔**Done (60%)**
Build data base background rate depending :	➔**Done (80%)**

- sec beam (Ti, Xe, U, frag)/sec targ (Be, Au)
- position secondary target (23 cm or 13cm)
- lead shielding
- threshold

Ti knock out statistics	➔**Done (analyzing)**
Xe fragmentation statistics	➔**Done (analyzing)**
Use U Doppler shifter x-rays to check Doppler position resolution	➔ **Done with Xe ☺**

Not done : new readout MUSIC detector,

Technical commissioning 80%

Build data base background rate depending : ➔**Done (80%)**

- sec beam (Ti, Xe, U, frag)/sec targ (Be, Au)
- position secondary target (23 cm or 13cm)
- lead shielding
- threshold

Xe beam part of the runs we were not implanting in the target! Not reaching LYCCA

➔ when we noticed that we did it again at the end

U beam : same problem again, we it was realized the shielded double went astray

➔ so no proper data with U and lead shielding!!!

Results from the technical commisioning

Hector time spectra ➔ L. Cortes talk

LYCCA commissioning ➔ P.P.Sing talk

Rate and plan for analysis ➔ D. Ralet talk

First results online from AGATA ➔ G. Guastalla talk

First analysis results ➔ M. Reese

I will present : -things we learnt about AGATA
-rate on AGATA electronic
-data flow status

Technical commissioning goals

We had to learn the system at the same moment we had to use it on-line

➔Thanks to Dino and Caterina for their help teaching us
➔Thanks to Damiano, Patrick C.S., Nicolas, Eric, Xavier, Yann, Xavier L., Bruno for their support while installing, preparing it!!!

100 of parameters :

- Digitizers front end
- FEE electronic configuration
- Libraries reading Linco
- Configurations of actors in Narval

All make sense but all can be changed remotely, which is great… and bad

➔ Use or need of an elog for that or other ways to monitor changes?

Namming conventions to solve this week

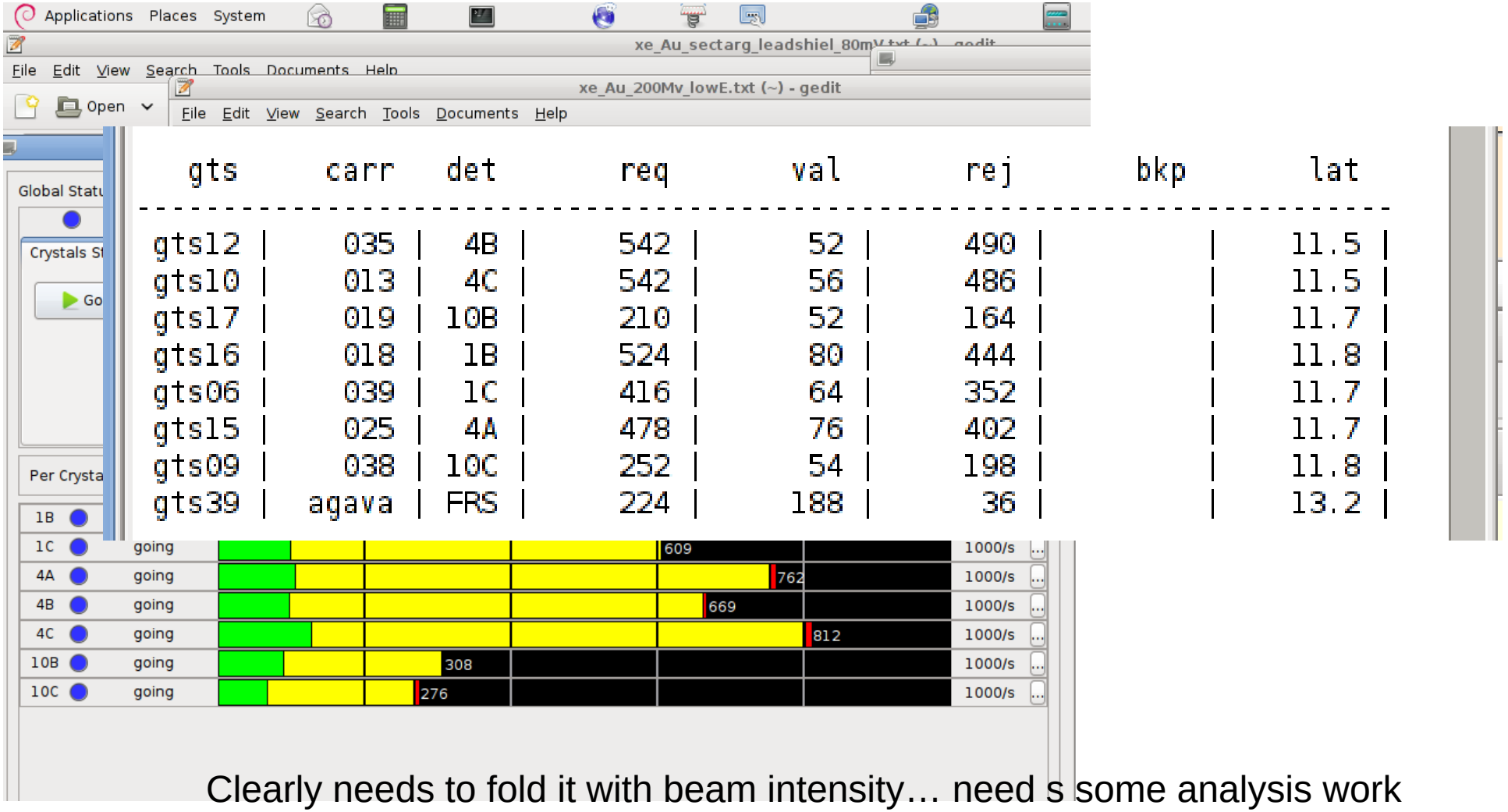
Need to agreed:

Position ID - Related to crystal ID?

Date 26/05/12		position clu	position cry	cry ID daq in confs	MDR	Digi	Digip	Fibers	ATCA master	ATCA slave	GTS	g
1B	B001	4	13	13	4B	10	10	[1,7]	18	24	16	
1C	C003		14	14	4C	11	11	[8,14]	39	70	6	
4A	A003		39	10	13A	16	16	43,100	25	32	15	
4B	B003	13	40	11	13B	17	17	[50,56]	35	22	12	
4C	C005		41	12	13C	18	18	[57,63]	13	26	10	
10B	B009	1	4	4	1B	0	30	[101,107]	19	21	17	
10C	C004		5	5	1C	1	31	[108,114]	38	23	9	
AGAVA											39	

AGATA electronic rates

Ex : Xe on Au target 200 mV threshold on the analogue AGATA trigger

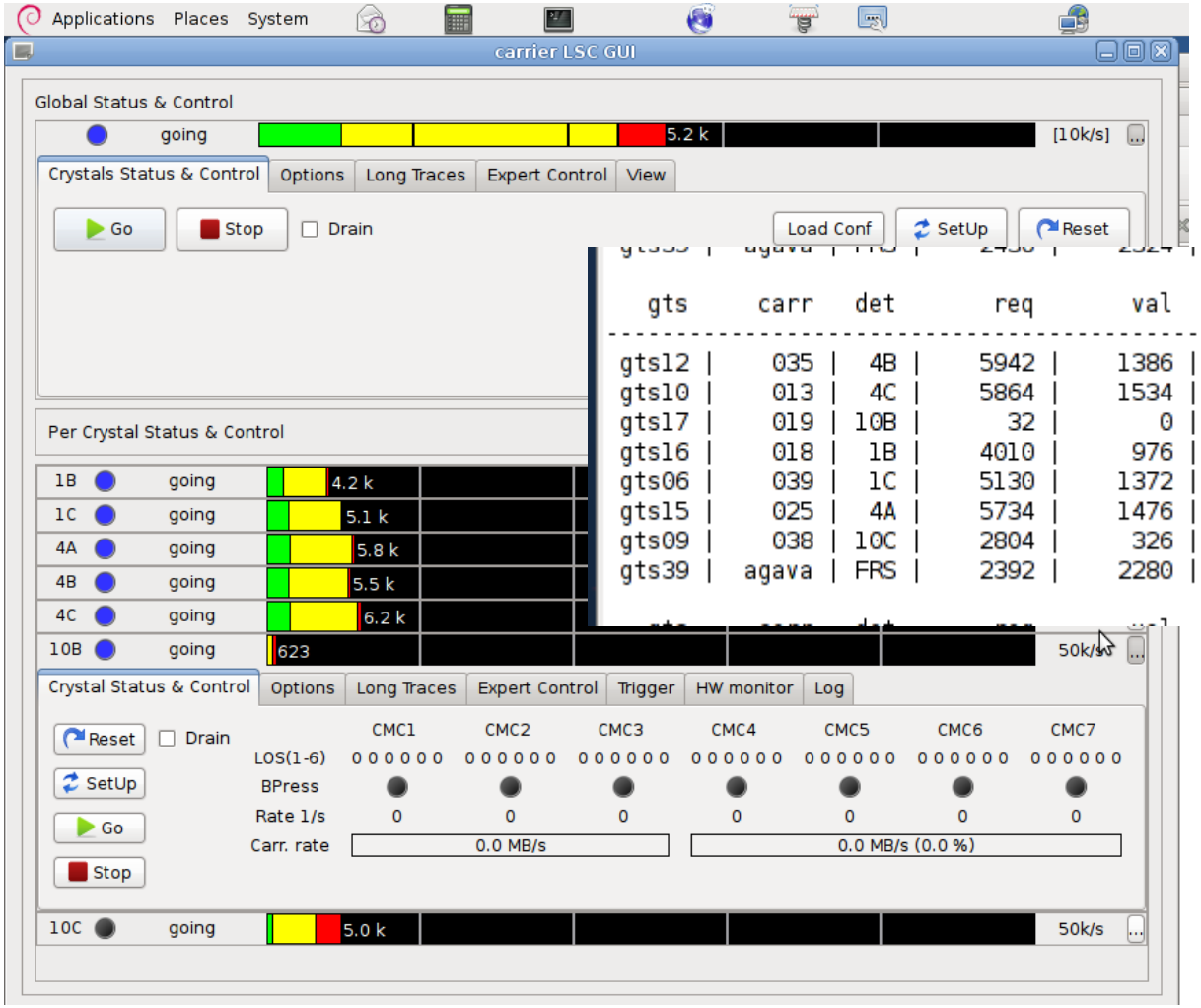


gts	carr	det	req	val	rej	bkp	lat
gts12	035	4B	542	52	490		11.5
gts10	013	4C	542	56	486		11.5
gts17	019	10B	210	52	164		11.7
gts16	018	1B	524	80	444		11.8
gts06	039	1C	416	64	352		11.7
gts15	025	4A	478	76	402		11.7
gts09	038	10C	252	54	198		11.8
gts39	agava	FRS	224	188	36		13.2

Clearly needs to fold it with beam intensity… need s some analysis work

AGATA electronic rates

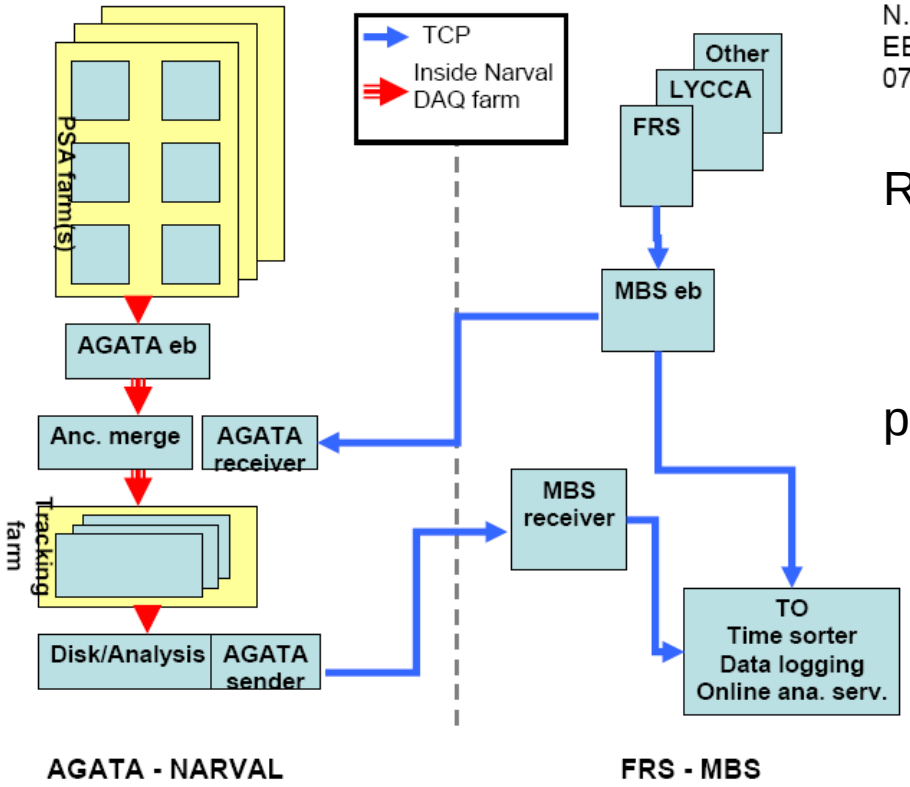
U+Au, highest rate on the crystals. 10B and C started to ring (not related)



gts	carr	det	req	val	rej	bkp	lat
gts12	035	4B	5942	1386	4556		11.7
gts10	013	4C	5864	1534	4330		11.9
gts17	019	10B	32	0	32		11.9
gts16	018	1B	4010	976	3034		11.9
gts06	039	1C	5130	1372	3758		11.7
gts15	025	4A	5734	1476	4258		11.8
gts09	038	10C	2804	326	2478		11.8
gts39	agava	FRS	2392	2280	112		13.5

More details, see Damian’s talk

Data flow coupling status



Idea of online merging :

N. K➔ assures online on both sides

EE,

07-➔ lenthly discussed and long time agreed

Realization :

➔ some delay in MBS side (see N Kurz talk)

➔ online event builder : 10% efficiency pb

➔ some incomprehension with the local physics about it still present (solution?)

Online : wrtie ADF files at each producer
Then rely on merging offline

Offline merging : some delays due to ADF mix old and new format ➔ could we converge to only new format at GSI?

Here we miss the four weeks not present to test properly the system, we should take the opportunity of the coming month to finalize this!!!

Technical commissioning conclusion

Questions open :

- Analysis still needed, how coordinated in GSI and outside?
- Does we write some report about it?
  - ➔ aim was of a setting database for experiments
- Deadlines are obvious : before performance commissioning!

T.Alexander, F.Ameil, Y.Aubert, D.Bazzacco, D.Bortolato, A.Boston, P.Boutachkov, C.Domingo-Pardo, N.Dosme, E.Farnea, A.Gadea, P.Golubev, G.Guastalla, J.Gerl, R.Gernhäuser, N.Goel, M.Gorska, X.Grave, T.Habermann, I.Kojouharov, A.Korichi, N.Kurz, X.Lafay, E.Legay, E.Merchan, C.Michelagnoli, S.Pietri, D.Ralet, M.Reese, D.Rudolph, H.Schaffner, M.Schlarb, P.P..Sing, O.Stesowski,H.J.Wollersheim

on behalf of the AGATA and PRESPEC collaboration