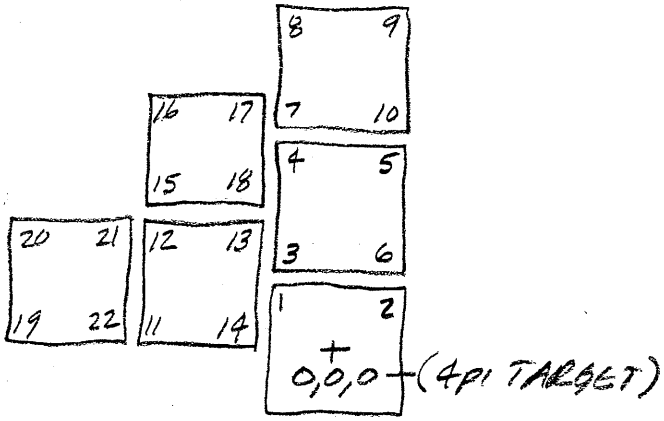
HIRA IN THE 4PI (EXP. 3045)

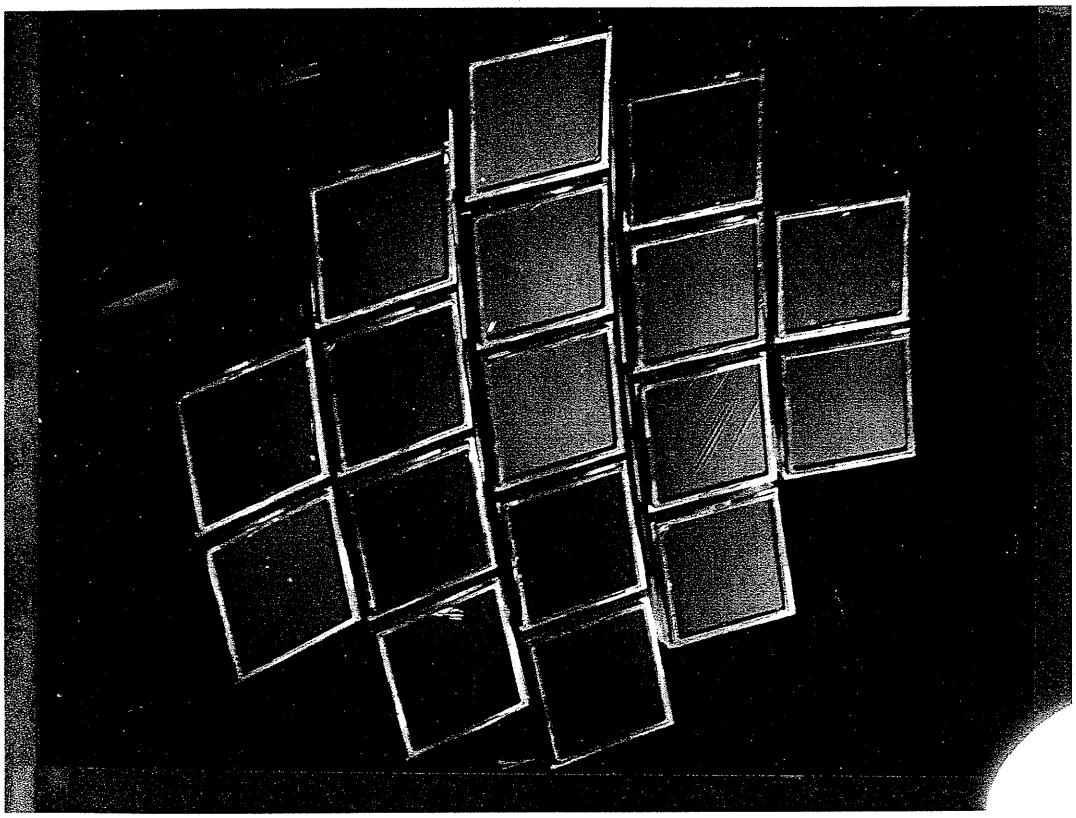
11-22-06
C.M.



DET. CORNER	ΔX	ΔY	ΔZ	Δ DISTANCE
1	1.425	1.425	24.510	24.593
2	1.425	1.425	24.510	24.593
3	1.425	1.787	24.486	24.593
4	1.425	4.612	24.114	24.593
5	1.425	4.612	24.114	24.593
6	1.425	1.787	24.486	24.593
7	1.425	4.968	24.044	24.593
8	1.425	7.720	23.306	24.593
9	1.425	7.720	23.306	24.593
10	1.425	4.968	24.044	24.593
11	4.722	.182	24.134	24.593
12	4.697	3.024	23.950	24.593
13	1.874	3.024	24.334	24.593
14	1.899	.182	24.519	24.593
15	4.691	3.385	23.903	24.593
16	4.616	6.179	23.352	24.593
17	1.793	6.179	23.736	24.593
18	1.868	3.385	24.287	24.593
19	7.832	.182	23.312	24.593
20	7.783	3.024	23.132	24.593
21	5.034	3.024	23.881	24.593
22	5.083	.182	24.061	24.593

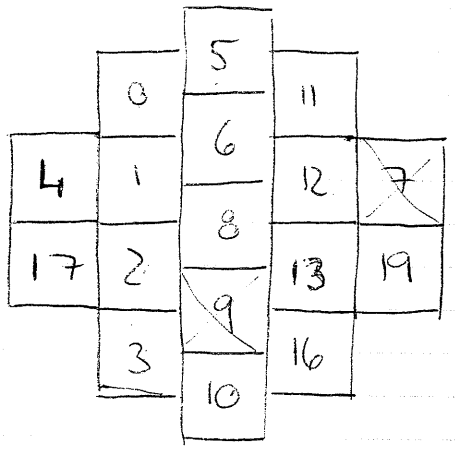
- ALL DIMENSIONS IN INCHES
- DIMENSIONS TO CORNERS OF FOIL FRAMES

HiRA ARRAY 11/13/06



11/14/06

ACTUAL FUPA CONFIGURATION



note: tel. 4, 17 have no dE

tel. 13 = E 2113-6 inside

BIAS + leakage currents

tel.	E slot/CAEN	E bias	E leak. I	dE PA	dE bias	dE leak. I	dE slot
4	Tau 0 card 9	300	2.58		9	0.16	
17	Tau 0 card 6	300	3.1		8	0.06	
0	Tau 0 card 15	290	1.24	PA9	7	0.108 / 0.6	T5S9
1	Tau 0 card 12	350	2.32	PA4	9	0.27	T5S15
2	Tau 1 card 6	310	1.64	PA7	6	0.26	T5S10
3	Tau 1 card 3	395	2.00	PA6	7	0.171	T5S12
5	Tau 1 card 15	340	2.95	PA19	11	0.11	T4S7
6	Tau 1 card 12	440	2.76	PA14	7	0.21	T4S15
8	Tau 1 card 9	450	1.51	PA13	8	0.057	T4S6
X 9	Tau 2 card 9	350	2.02	PA5	9	0.029	T5S13
10	Tau 2 card 6	210	1.59	PA10	8	0.033	T5S7
11	Tau 2 card 15	350	1.71	PA3	7	0.015	T4S10
12	Tau 2 card 12	420	~ 2.6	PA17	7	0.038	T4S9
13	Tau 3 card 9	279	1.84	PA12	8	0.27	T5S4
16	Tau 3 card 6	220	2.3	PA11	7	0.03	T5S6
X 7	Tau 3 card 15	340	3.33	PA8	7	334 / 0.01	T4S13
19	Tau 3 card 12	310	1.74	PA16	6	0.081	T4S12

Nov 14, 2006

DF Thresholds

Pulser Cal Board

E P 778 mod ←]
V_{peak}: 0.712 V]

Trigger on 1 kHz
always look on Ch 5

Amplitude at which Pulse trigger gives way to α's

Tower	Slot	ch	Thresh (for all)	VA	V (8,778)
4	10	1	-15	0.058	0.8311
		2	-11	0.083	0.8488
	9	1	-13	0.044	0.7926
		2	-13	0.067	0.801
	12	1	-14	0.061	0.8364
		2	-16	0.060	0.7932
	13	1	-14	0.046	0.8310
		2	-16	0.078	0.7870
	15	1	-15	0.068	0.8608
		2	-14	0.0811	0.7993
	16	1	-16	0.0638	0.7936
		2	-12	0.0345	0.7945
5	4	1	-17	0.0764	0.9275
		2	-19	0.0747	0.7839
	6	1	-19	0.1021	0.81315
		2	-26	0.0733	0.80340
	7	1	-14	0.066	0.79980
		2	-18	0.095	0.81570
	9	1	-15	0.1142	0.76785
		2	-15	0.06195	0.7482

(cont.)

Tower	Slot	Ch	Thresh (for All)	V_A	V(220)
5	10	1	-12	0.0894	0.8475
		2	-11	0.0765	0.7933
	12	1	-11	0.08395	0.8484
		2	-13	0.0386	0.801
	13	1	-15	0.0954	1.0716
ch 13 Noisy ch 5 dead		2	-13	0.046	0.694
	15	1	-14	0.0380	0.8161
		2	-15	0.085	0.7774
4	7	1	-14	0.06465	~~0.8032~~ 0.8003
		2	-14	0.02775	0.8033

4π + HiRA group meeting

To do list:
1) targets → plastic targets - 2 thicknesses
2)

reactions:
$^{40}Ca + ^{40}Ca$
$^{48}Ca + ^{48}Ca$

11/15/2006 Run 161 - alpha calibration of dE's, 13 out of 15 seem to work well, one has too low gain, second too low statistics

Run 162 - alpha calibration again, now both working dE work fine, one board had accidently OR turned off), for the other we changed the board

Run 163 - pulser ramp. of PA 10 (dE of Tel 10), 100 Hz, 0.1- in 21 steps, 10 s per step

Run 164 - the same for	PA 11	RUN 172 -	-"-	for PA 08
Run 165 -	-"-	PA 12	RUN 173	-"-	PA 07
Run 166 -	-"-	PA 13	RUN 174	-"-	PA 06
Run 167 -	-"-	PA 14	RUN 175	-"-	PA 05
Run 168 -	-"-	PA 16	RUN 176	-"-	PA 04
Run 169 -	-"-	PA 15	RUN 177	-"-	PA 03
Run 170	-"-	PA 19			
Run 171 -	-"-	PA 09			

Nov. 16, 2006 Testing EF + EB's

0800 Bias Telescope 4 EF + FB

V_B = +100V
V_F = -200V
I = 2.06 mA

Note ~~540 Hz~~ 800kHz
@ ~~10 mV pp~~ 20 mV pp
Noise on EF Sinusoidal
Turbo pump?
Not on Rack

Noise on ~~CSA~~ Shaper
FB: 18.7 mV RMS white
FF: 8 mV RMS after oscillation subtraction

TO 58 C3/4 very Noisy
tried to increase Analog ref, but
had to disable several channels
(Tel4.FB) Thresholds very high
CSA Signals look OK, though.

Trains look OK

Run 178 Tele 4 EF + EB Cs Source

1041 Begin Biasing FF from Tel 17

V_B = +100
V_F = -200
I = 2.36 mA

Also 540 Hz ~~Noise~~
(sinusoidal on Front)
~30 mV pp

Noise on CSA
~20 mV RMS

Run 179 Telescope 17 EF + FB Cs source

Tower 0 slot 5 has a peak at
@ ~ channel 13372 for Ch 0 - 10
FB

Run 180 Telescope 18 EF + FB Cs
-used wrong triggers on previous

11/16/2006 During day: ~~during~~ noise causing OE's going crazy

↳ it turns out that noise is induced by PLC computer which can transmit it (even when turned off) to the rest of the system by:

1) grounding copper braid of CAEN HV supply which is touching the input connectors of PLC
2) cables running to PLC if sufficiently close to other cables

evening: noise problem (at least) temporarily ~~closed~~ solved

11/17/2006 inspection of E's via inspect channel (with full bias)

Tel 4: (Tower 0; slot 9, 8)

↳ all channels seem reasonable, but both chips #2 have noise of 540kHz with ~ 15mV amplitude (peak-to-peak)

Tel 17: (Tower 0; slot 6, 5)

↳ chips #2 again ~540kHz noise

→ slot 6 chip 2 ch 1 → huge noise ~ 150mV, bias dependent

slot 5 chip 1 ch 0 } huge noise ~ 150mV (not checked for bias dependence)
slot 5 chip 2 ch 15

possible DISCHARGE !!

Next we bias all other E's

↳ Tel 2 ; i.e. Tower 1 slot 6, 5 cannot be biased

↳ bad cable ??

↳ all other E's look OK, noise OK, thresholds seem to be possible to lower to mid teen's

4:41 AM RUN 191 – alpha spectrum with all E's + dE's

↳ but trigger only by E fronts ~~from Tower 0~~

Note: deadtime huge → ~ 12ms instead of ~ 100μs

RUN 192 – pulser ramp → Tower 0, both polarities 0–10 V, 11 steps, 10. 100 Hz

THINGS TO DO: and/or FIX

1) Fix SpecTcl → HiDA processor
2) Thermocouples in Tow 0, 2, 3
3) noise problem X reliable operation of PLC
4) discharge at Tel 17 → detector or chipboard ??
5) CsI cables
6) drain wire of CsI cables on distr. boxes is not grounded

11/17/2006

3:00 PM → All E's biased fully for ≥ 3 hours

leakage currents as

		V_{bias}	I_{leak} at 3:00 PM	I_{leak} at 5:00 PM
Tow 0	Slot 15	290	0.96	0.96
0	12	350	1.90	1.90
0	9	300	2.40	2.38
0	6	300	2.76	2.74
Tow 1	Slot 15	340	3.08	3.06
1	12	440	2.18	2.16
1	9	450	1.88	1.86
1	6	–	–	
1	3	395	1.88	1.84
Tow 2	Slot 15	350	1.90	1.88
2	12	420	2.12	2.12
2	9	350	2.34	2.32
2	6	210	2.00	1.98
Tow 3	Slot 15	340	3.74	3.74
3	12	310	1.26	1.26
3	9	250/270	1.66	1.80*
3	6	220	1.82	1.80
			T = 73.5 °F	T = 74.5 °F

↓ cooling CsI PA's

leakage current sum:

Tow 0 – 8.09 μA
Tow 1 – 9.06 μA
Tow 2 – 8.41 μA
Tow 3 – 8.52 ± 0.03 μA

5-00PM

Test of CsI biasing:

↳ 1) bias to 10V → all CsI groups decrease noise
2) full bias to 80V
↳ checking all individual channels for cosmics
↳ noise level ≤ 2mV

problematic channels:
CsI shaper 0 ch 4-15 no cosmics
↳ it seems that Vlad screwed up cabling and hook up the CsI shapers in a reverse order, i.e. shap0 has only 1 CsI cluster
shap4 has all 4 CsI cluster
→ we continue with the test just to see functionality of the CsI
↳ cables + mapping should be checked/reconnected later

shaper:
CsI 0 → only ch 1-4 see cosmics
CsI 1 → only ch 1-4 see cosmics
CsI 2 → only ch 1-4 see cosmics
CsI 3 → only ch 1-4 see cosmics
CsI 4 → all channels see cosmics, ch 3 sees nothing

- new check of CsI after change of CsI mapping

shaper:
CsI 1 → ch0 ch1 ch2 ch3 ~3.7mV Pk-Pk
ch4 ch5 ch6 ch7 Pk-Pk
CsI 2 → ch0 ch1 ch2 ch3 overall ~3.7mV
ch4 ch5 ch6 ch7
CsI 3 → overall 3.5mV Pk-Pk
CsI 0 → overall ~3.5mV

new CsI mapping

~~ADC slot 5 tel shaper ADC slot 6 tel shaper~~

ADC slot 5	tel.	shaper	ADC slot 6	tel.	shaper	ADC slot 7	tel.	shaper
0	tel. 4 CsI 0	CsI 0	0	Tel 8		Tel 19		
1	tel. 4 CsI 1	-"-	1					
2	tel. 4 CsI 2	-"-	2					
3	tel. 4 CsI 3	-"-	3	Tel 9				
4	tel. 17 CsI 0	-"-	4	↓				
5	tel. 17 CsI 1	-"-	5					
6	tel. 17 CsI 2	-"-	6					
7	tel. 17 CsI 3	-"-	7					
8	tel. 0 CsI 0	-"-	8	Tel 10				
9	tel. 0 CsI 1	-"-	9					
10	tel. 0 CsI 2	-"-	10					
11	tel. 0 CsI 3	-"-	11					
12	tel. 1 CsI 0	-"-	12	11				
13	tel 1 CsI 1	-"-	13					
14	tel 1 CsI 2	-"-	14					
15	tel. 1 CsI 3	-"-	15					
16	tel 2 CsI 0	CsI 1	16	12				
17	tel 2 CsI 1		17					
18	tel 2 CsI 2		18					
19	tel 2 CsI 3		19					
20	tel 3 CsI 0		20	13				
21	tel 3 CsI 1		21					
22	tel 3 CsI 2		22					
23	tel 3 CsI 3		23					
24	tel 5 CsI 0		24	14				
25	tel 5 CsI 1		25					
26	tel 5 CsI 2		26					
27	tel 5 CsI 3		27					
28	tel 6 CsI 0		28	7				
29	tel 6 CsI 1		29					
30	tel 6 CsI 2		30					
31	tel 6 CsI 3		31					

opening the chamber:

1) absorber foil
2) Tel 2 - bias cables?
3) 4i - HE module
4) temperature in hall
5) Tel 17 - bias chipboard - test
6) alpha source

plan:

9:30PM Ball vented
↳ absorber foil - 3 layers of 5mg Sn/Pb ($= 15 mg/cm^2$ added
→ cable for Tel 2 visually inspected, not possible to reach by hand, looks OK, but not conclusive
→ alpha source exchanged, now we have ~ 10 times weaker
→ tests of PLC temperatures
→ thermometer placed at Tel 10 → 23.3°C / 19 i. Imi

22.34	22.71	22.95	22.59
22.47	22.71	23.93	23.93

thermocouple readings

11/18/2006

1:AM Ball pumped again, cryopump on $P = 3.0 \times 10^{-5}$
2:AM $P = 2.1 \times 10^{-5}$

↳ in the meantime → chipboard at Tow1 slot6 repaired,
↳ it was not possible to bias Tel 2, now its OK !!

→ system very noisy, copper shielding around "Flange ↔ motherboard" cables has to be repaired / improved

leakage current situation (as of 3:20 AM, 11/18/2006)
T = 71.9 F, P = 2.0×10^{-5} Torr

Tower	Slot	V_{bias}	I_{leak}	
Tower 0	15	280	0.82	0.84
0	12	350	1.64	1.64
0	9	300	2.02	2.04
0	6	300	2.34	2.38
Tower 1	15	340	2.56	2.64
1	12	440	1.82	1.84
1	9	450	1.58	1.60
1	6	310	1.08	1.08
1	3	395	1.58	1.60
Tower 2	15	350	1.60	1.68
2	12	420	1.80	1.80
2	9	350	1.98	1.98
2	6	210	1.64	1.66
Tower 3	15	340	2.96	3.34
3	12	310	1.10	1.12
3	9	270	1.50	1.52
3	6	220	1.50	1.54

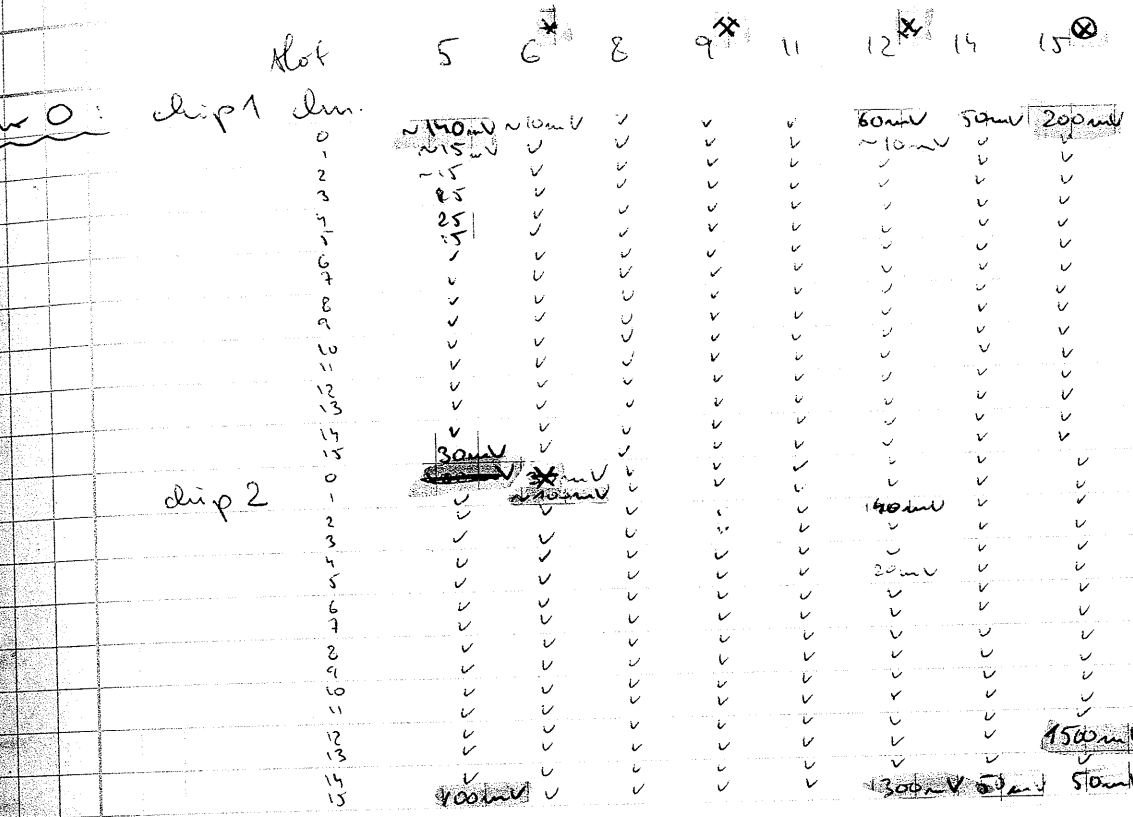
↑ at 5:40AM
T = 70.4
P = 2.3×10^{-5} Torr

leakage current sums:

Tow 0	6.84	6.94
Tow 1	8.72	8.85
Tow 2	7.07	7.15
Tow 3	7.12	7.59

4:20 AM We learn that cryopump is making ~550 Hz noise which reaches even through the sleeper

↳ cryo turned off, vacuum still ≤ 3·10^{-5} Torr



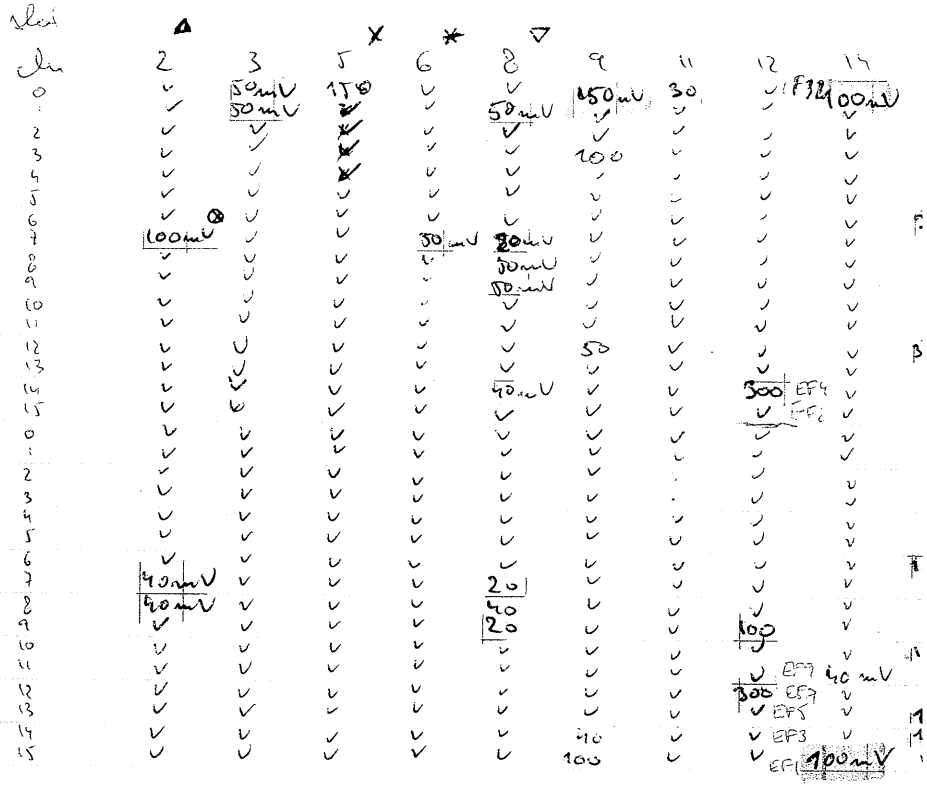
- ~500 Hz on E fronts → ~40mV at CSA
  ~4mV at sloper
- CSA OK, but sloper absolutely crappy (~3V) → oscillations
  ↳ all chip 2 chns
- 536 Hz noise → 800mV at CSA at ch0 then slowly decreasing to 100mV
  60mV at sloper
- 536 Hz noise → 40mV at CSA at ch15 decreasing toward ch0
  ≤5mV at sloper
- Very unstable baseline for chip 2 → 80mV @ CSA
  10mV @ sloper

SOME HORRIBLE THINGS ARE GOING ON THE CHIP BOARDS AND/OR DETECTORS

seems like heavy discharge which does not go away with lower bias
↳ problem with chip board (?!?)
↳ same intensity at 50V as at full bias
↳ Row 0 unbiased temporarily !!!
↳ discharge at Tel 0 column only at ?

5:40 AM

Tour 1: chip 1



chip 2

▲ 96 Hz noise → 50 mV at CSA
45 mV at shaper → almost square signal
↳ at chan 0

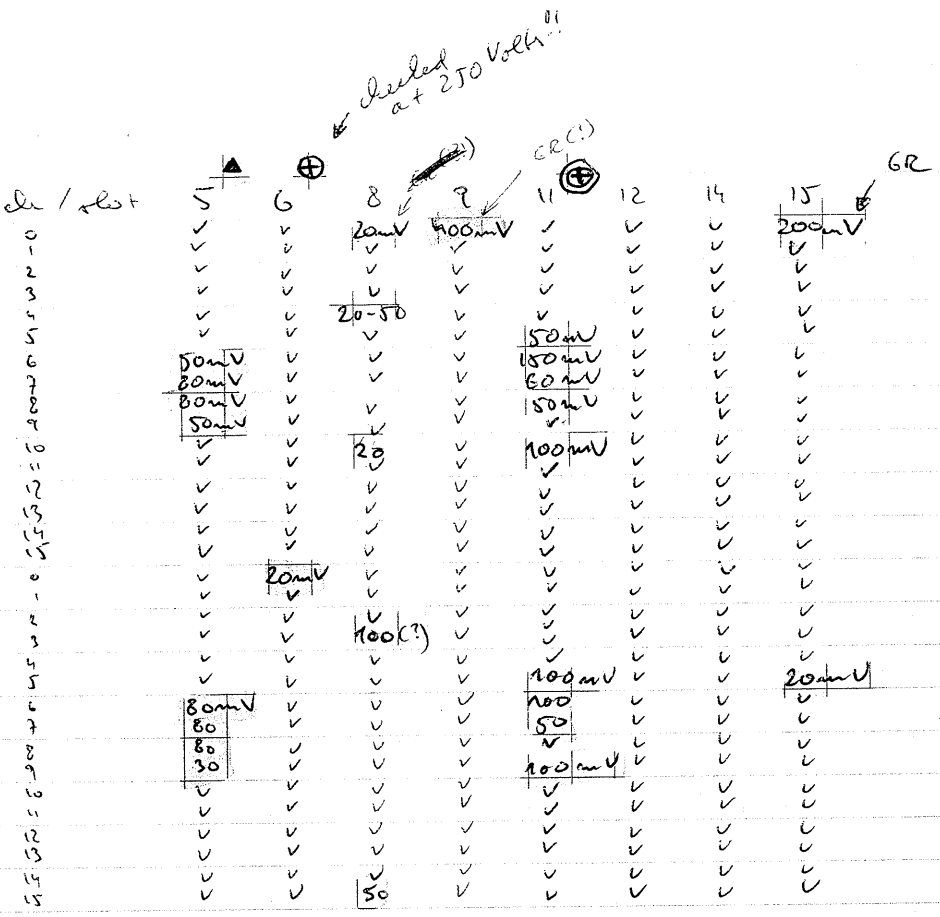
⊗ after increasing bias by 20V → intrinsic noise goes down but structure like "micro breakdown" appears → discreet charge packets ~100 e⁻
↳ ch 7 chip 2 improves
ch 8 chip 2 remains bad

x – CSA offset completely different than for ch 0 → something wrong
↘ strong pulses ~50 mV on chip 1

* chip 1 troubles with extra pulses ⊓ ~50 mV
↘ remind the "camel humps"

▽ little underbiased → increase only by 10 Volts, bias already too

Tour 2: clip 1 de / slot



▲ detector seems to be underbiased ; additional 40 Volts does the job
↳ new "nominal bias" = 250 (150+100) Volts for Tel 10
(Tour 2 card 6)

⊕ noise 290 kHz ~ 15 mV @ CSA
5 mV @ shapers + somewhere also 510 Hz ~ 40 mV

⊕ underbiased → biased to 440 (340+100) Volts

Tentative E-front/back mapping :

clip 1 de 0 = EF/B32 8 = EF16
1 = EF/B30 9 = EF14
2 = EF/B28 10 = EF12
3 = EF26 11 = EF10
4 = EF24 12 = EF8
5 = EF22 13 = EF6
6 = EF20 14 = EF4
7 = EF18 15 = EF2

Tow 3:

chip	chn / slot	5	6	8 ▲	9 +	11 ⊗	12 *	14 O	15
1	0	✓	40mV	60mV	✓	✓	300mV	600mV	
	1	✓	✓	60	✓	✓	✓	100mV	
	2	✓	✓	80	✓	✓	✓	✓	
	3	✓	✓	200mV	✓	✓	✓	✓	
	4	✓	✓	200	✓	✓	✓	✓	
	5	✓	✓	200	✓	✓	✓	✓	
	6	60mV	✓	250	✓	✓	✓	50	
	7	120mV	✓	250	✓	✓	✓	150mV	
	8	120mV	✓	200	✓	✓	✓	✓	
	9	120mV	✓	250	✓	✓	✓	150mV	
	10	✓	✓	200	✓	✓	✓	150	
	11	✓	✓	150	✓	✓	✓	150mV	
	12	✓	✓	180	✓	✓	✓	150	
	13	✓	✓	150	✓	✓	✓	150	
	14	✓	✓	150	✓	✓	✓	150	
	15	✓	✓	50	✓	✓	✓	150	
2	0	✓	✓	50	✓	✓	400mV		
	1	✓	✓	50	✓	✓	✓	150	
	2	✓	150mV	✓	✓	✓	✓	150	
	3	✓	✓	120	✓	✓	✓	150	
	4	✓	✓	200	✓	✓	✓	150	
	5	20mV	✓	220	✓	✓	✓	150	
	6	100mV	✓	220	✓	✓	✓	150	
	7	120mV	✓	250	✓	✓	✓	100	
	8	120mV	✓	250	✓	✓	✓	150	
	9	60mV	✓	250	✓	✓	✓	100	
	10	✓	✓	200	✓	✓	✓	150	
	11	✓	✓	150	✓	✓	✓	150	
	12	✓	✓	80	✓	✓	✓	100	
	13	✓	✓	50	✓	✓	✓	150	
	14	✓	✓	40	✓	✓	✓	150	
	15	✓	20mV	100	✓	✓	100mV	~3 Volts	

↑ is this detector underbiased ???

↘ extra 40 Volts of bias solve the trouble !!!

↳ and problems at slot 6 seem to be still the same

New bias of Tel 16 (Tow 3, slot 6) = 260 (160+100) Vo[lts]

▲ extremely underbiased → when biased to 410 Volts (310+100) all up, except 2 chanels: chip 1 ch 7, chip 2 ch 6 which remain at ~ 4[…]

↳ slot 9 investigated with higher bias

+ again 530 Hz noise ~ 50 mV @ CSA at ch 15 and ~ 120 mV at […]

⊗ 47 kHz noise ~ 30 mV at CSA and 15 mV at shaper

↳ both chips but not every single chanel

* 530 Hz noise → up to 100 mV at CSA

O very unstable baseline (~ ± 50-100 mV)

↳ huge discharge at ch 0 chip 1 disappears if bias lowered and then increased only to 300 Volts (100+200) → even bigger discharge at chip 2 ch 15

→ after a while of quiet operation, breakdown already at 300 Volts

✗ again 530 Hz noise of ~ 100 mV amplitude

Tel 7 (E-detector) is considered BROKEN!!! and should not be used!!!

Unless it can be verified that the problem is on the clipboard

11/18/2006 Leakage current situation (as of 11/18/2006 at 9:50 PM)

Tel 4 - mirbonds EB
Tel 7 - modified + mirebonds bad
Tel 9 - Micron?
Tel 10 - rebonded
Tel 11 - Micron?
Tel 12 - Micron
Tel 14 - Micron - N/A
Tel 16 - Micron?
Tel 09 - Micron?

1 day
2085-14 ✓ - 7
(2394-5 - 9)
2403-02 ✓ - 14

2
2393-143 - 16
2085-713 ✓ - 3
2113-7 ✓ - 12

6

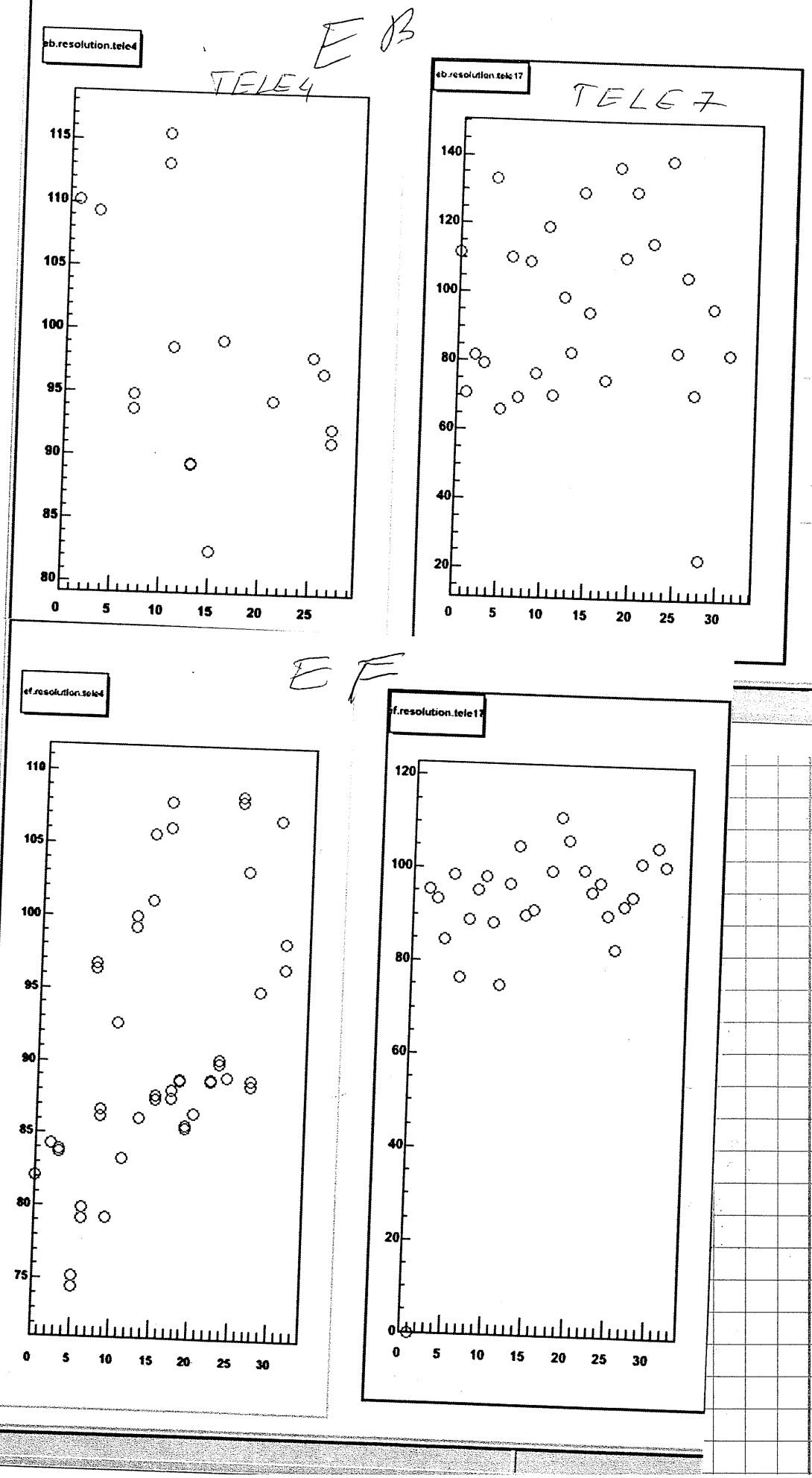
V_{bias}	I_{lead}	I_{lead}	I_{lead}	I_{lead} / V_{bias} Cat 4:15AM
100	0.56	0.56	0.58	0.58 / 100
350	1.56	1.58	1.60	1.60 / 350
300	1.90	1.94	1.98	1.98 / 300
300	2.20	2.22	2.26	2.26 / 300
340	2.52	2.56	2.64	2.62 / 340
440	1.72	1.76	1.80	1.80 / 440
450	1.58	1.60	1.64	1.72 / 460
310	1.00	1.02	1.04	1.04 / 310
395	1.50	1.52	1.54	1.58 / 415
350	1.54	1.54	1.58	1.58 / 350
420	1.72	1.72	1.78	1.84 / 440
350	1.86	1.86	1.92	1.92 / 350
250	1.64	1.66	1.70	1.68 / 250
100	1.40	1.42	1.46	1.44 / 100
310	1.06	1.06	1.08	1.08 / 310
410	1.54	1.56	1.62	1.62 / 410
260	1.46	1.50	1.52	1.50 / 260

R T = 74.2F
P = 1.5×10^{-5} Torr

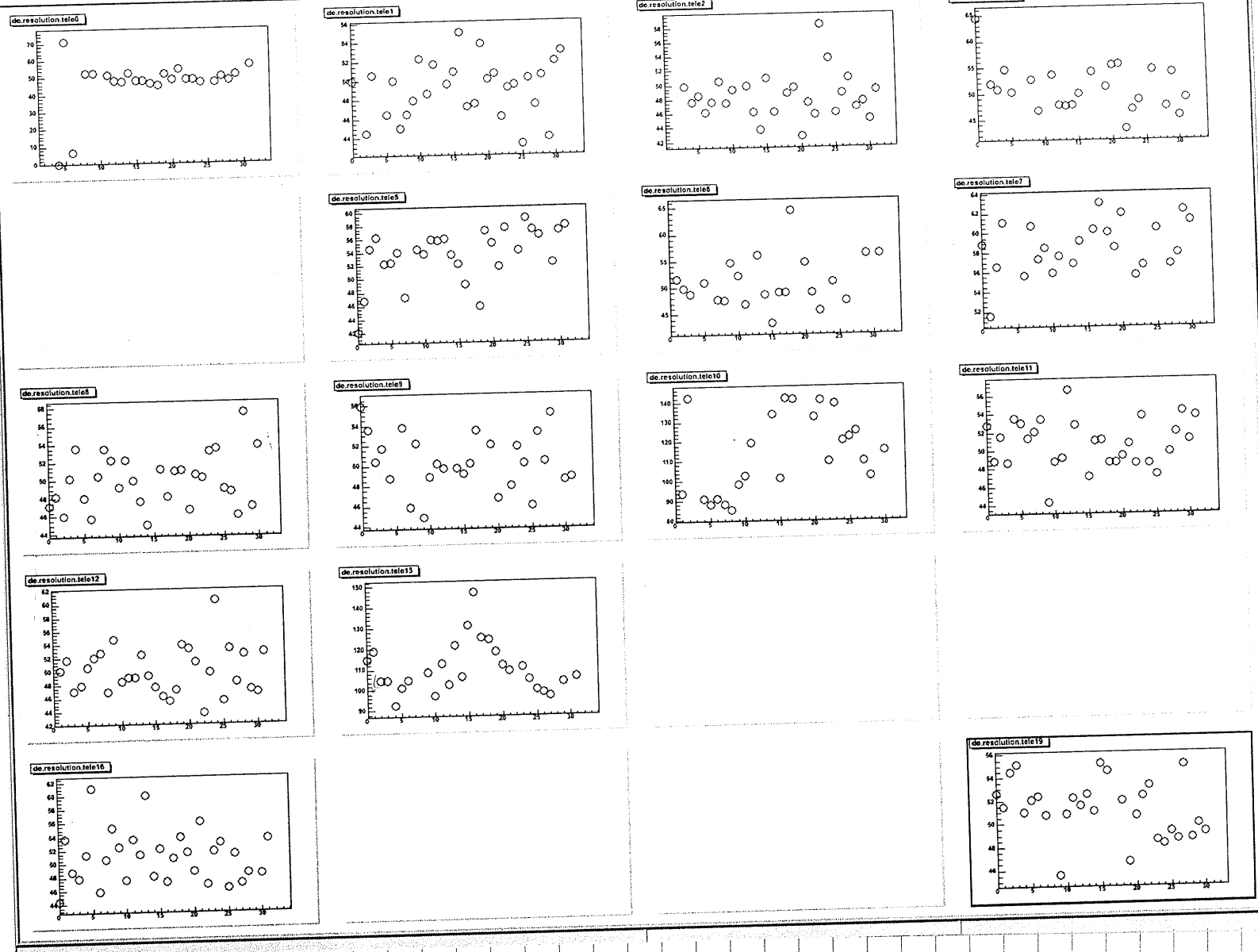
R T = 71.4 °F
P = 1.4×10^{-5} ?

Total Ileak from Terelac:

Tow 0 -	6.31	6.39	6.51	6.47
Tow 1 -	8.47	8.59	8.79	8.87
Tow 2 -	6.79	6.86	7.04	7.06
Tow 3 -	5.53	5.60	5.72	5.69
	↑	↑	↑	↑
	9:50PM	10:25PM	0:55PM	4:15AM
	(74.2°F)	(74.6°F)	(72.2°F)	(71.4°F)


eb.resolution.tele4
EB
TELE4
eb.resolution.tele17
TELE7
ef.resolution.tele4
EF
ef.resolution.tele17
E resolution

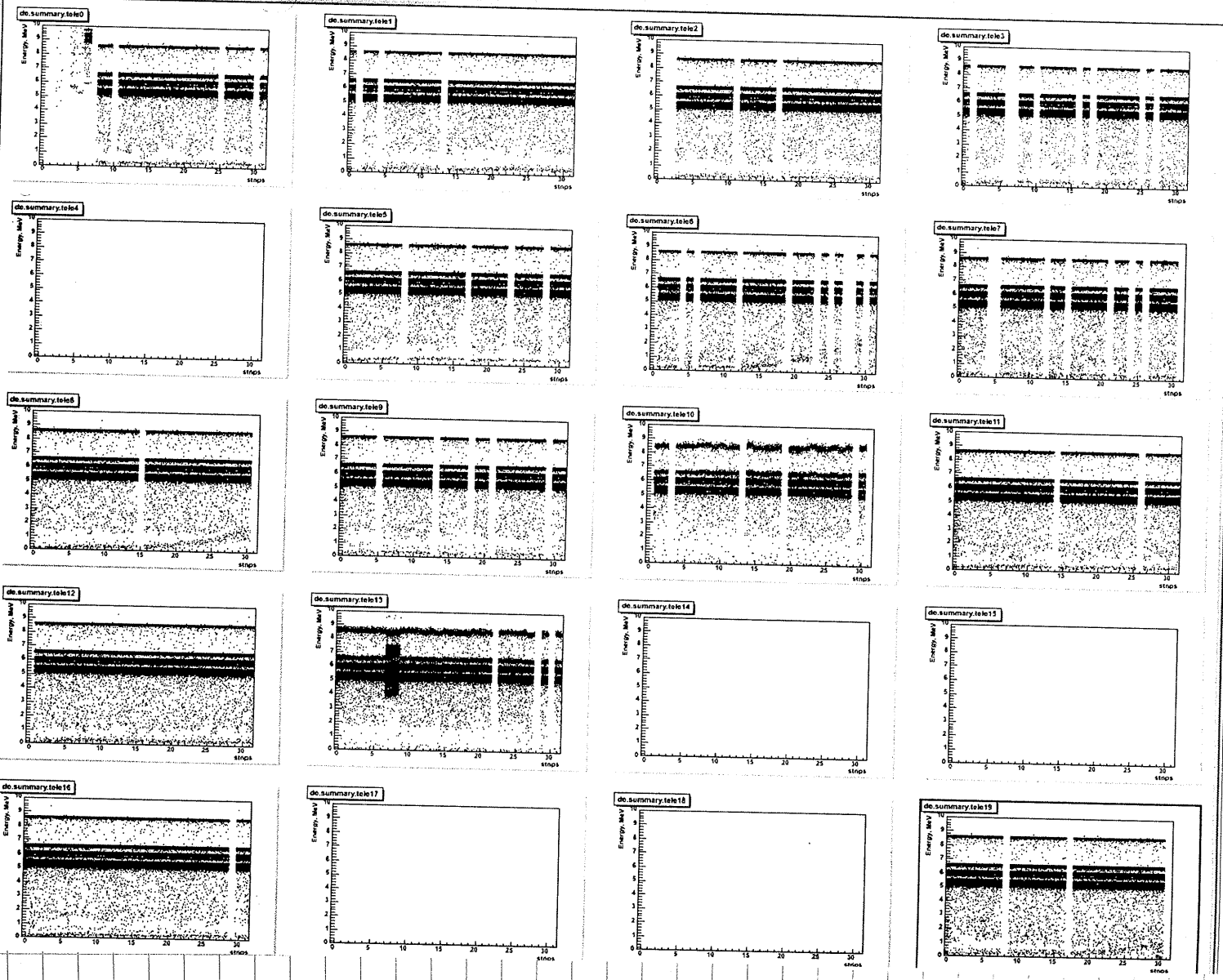
dE resolution



ΔE summary after calibration

ThCalib | Manual | CsICalib | Pulser | de.summary | ef.summary | eb.summary | de.resolution | ef.resolution | eb.resolution

pad#: 0 ZOOM



↑ without Aluminum

Nylon targets → oxygen inside
Plastic target → carbon

Calcium → multiplicity distribution

} → to see what is the multiplicity for oxygen
↳ can we gate on multiplicity to be sure that there is no oxygen

Bill's phonecall at 7:00PM

11/19/2006

Next: Inspection of CSA + shaper outputs of dE's (Tow 4 + 5)

Tow 4: 6 7 9 10 12 13 15

chip 1 ch 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

chip 2 ch 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

11:25 PM → thresholds set at dB's at −15 → −9, no channels masked

↓ alpha spectra recorded RUN213

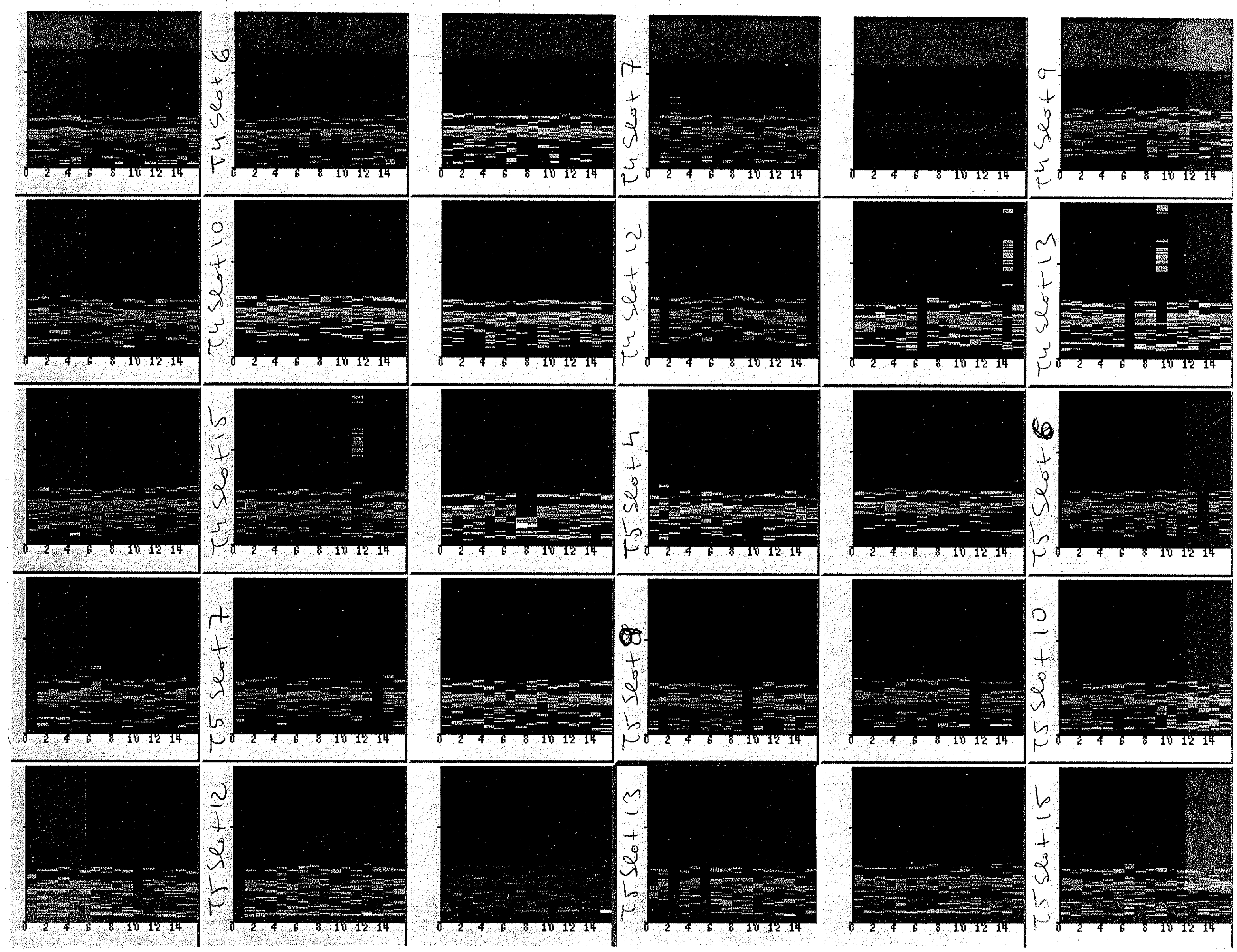
BAD CHANNELS: (probably cable or chipboard)

Tow 4	slot	7	chip	1	ch	2	– too high gain
	slot	9	chip	0	ch	0	– dead
	slot	12		1		1	– dead
	slot	12		1		15	– dead
		13		0		6	– dead
		13		0		14	– too high gain
		13		1		6	– dead
		13		1		9	– too high gain
		15		1		2	– too low gain
		15		1		11	– too high gain
Tow 5	slot	4		0		7	– too low gain /b
		4		0		8	– too low gain /bo
		6		1		13	– dead
		7		0		0	– dead
		7		1		13	– dead
		9		1		9	– dead / missing
		10		0		11	– dead / missing
		12		0		10	– dead / missing
		12		1		0	– dead / missing
		13		1		2	– dead / missing
		13		1		5	– dead / missing

! 21 problematic channels – out of 480

Tower		Slot	Chip	Telescope	run161	run162	run 171
TELE							
11	T4	10	0	11	OK	OK	O.K
	T4	10	1	11	OK	OK	
19	T4	12	0	19	OK	OK	O.K
	T4	12	1	19	CH # 1 dead	CH # 1, 15 dead	O.K
7	T4	13	0	7	CH # 6 dead	CH # 4, 5, 12, 15 dead (13 pads)	1, - only
	T4	13	1	7	CH # 6,11,14 dead; CH # 9 high pedestal	CH # 5, 8, 10, 15 dead	4, 5, 12, 15 dead, 15-ped
6	T4	15	0	6	CH # 4,12 dead	CH # 5, 12 dead	5, 8, 15
	T4	15	1	6	CH # 9, 12 dead; CH # 3,14 firing	CH # 9, (11) 12 dead pedest	4, 12
16	T4	16 in run161	0	8	OK } low gain/bad slot	slot 6 CH # 15 dead	9, only 1
	T4	16 run161	1	8	OK }	CH # 15 dead	slot 6 15
5	T4	7	0	5	OK } noisy	OK	6 15
	T4	7	1	5	OK }	OK	6.K
12	T4	9	0	12	CH 0 dead	CH # 0 dead	O.K , 2- pedestal
	T4	9	1	12	OK	OK	0-dead
							OK
2	T5	10	0	2	CH # 11 dead	CH # 0, 1, 2, 11 dead	0, 1, 2, 11
	T5	10	1	2	OK	OK	OK
3	T5	12	0	3	CH # 10 dead	CH # 5, 11 dead	11
	T5	12	1	3	CH # 0 dead	CH # 0 dead	0
9	T5	13	0	9	CH # 5, 13 dead	CH # 5, 13 dead	5, 13
	T5	13	1	9	CH # 2, 5, 13 dead	CH # 2, 5, 13 dead	2, 5, 13
1	T5	15	0	1	OK	OK	O.K
	T5	15	1	1	OK	OK	O.K
13	T5	4	0	13	OK; CH # 7, 8 low pedestal or gain	OK	7, 8 low pedestal
	T5	4	1	13	OK	OK	O.K.
16	T5	6	0	16	OK; CH # 7, 8 ~~high pedestal~~	OK	O.K.
	T5	6	1	16	CH # 13 dead	CH # 13 dead	13
10	T5	7	0	10	CH # 0, 13 dead	CH # 0, 13 dead	0, 13
	T5	7	1	10	CH # 13 dead	CH # 13 dead	13
0	T5	9	0	0	(CH # 9 dead) ↖ T5-S9-C1	OK	9
	T5	9	1	0	CH # 9 dead	CH # 9 dead	9

RUN213 - alpha for dE's with "common thresholds"



leakage current measurement on 11/17/2006:

		V_{bias}	I_{diag}	I_{leak}
Tower 0	Ring 15	400	0.56	0.58
0	12	350	1.46	1.50
0	9	300	1.32	1.82
0	6	300	2.04	2.12
Tower 1	15	340	2.34	2.46
1	12	440	1.64	1.70
1	9	460	1.58	1.64
1	6	310	0.98	1.00
1	3	415	1.44	1.50
Tower 2	15	350	1.46	1.52
2	12	440	1.64	1.70
2	9	350	1.76	1.82
2	6	250	1.56	1.60
Tower 3	15	400	1.34	1.38
3	12	310	1.04	1.08
3	9	410	1.46	1.50
3	6	260	1.42	1.48

↑ T = 75.0°F (~ 10:00 PM)

↑ T = 74.6 °F (@ 2:25 AM)

11/20/06 - 3.25 pm

3.25 pm What we want to do: (here: Micha, Vlad, Clemens)

- take x-Spectra with dE's and E's and optimize thresholds

→ biasing Eb: (up to 100 V)

Leakage Currents:

Eb T0:	4,06 μA
Eb T1:	5,12 μA
Eb T2:	4,54 μA
Eb T3:	4,44 μA

3.40 pm bias E's without - Tow 0 Card 15 Tel. 0
- Tow 3 Card 15 Tel 7

3.55 pm bias dE

temp: 73,1 F

Vacuum: Digital: $1.5 \cdot 10^{-5}$ Torr } with cryo pump
Analog: $1.15 \cdot 10^{-5}$ Torr

- shut of Gate valve
- unplug cryo pump
- shut down cryo

4.00 pm vacuum: Digital $1.7 \cdot 10^{-5}$ Torr } without cryo
Analog $1.55 \cdot 10^{-5}$ Torr

leakage current E's

Tow	Card	[μA]	Tow	Card	[μA]
0	15	0,66	2	15	1,80
0	12	1,70	2	12	2,00
0	9	2,16	2	9	2,22
0	6	2,42	2	6	1,90
1	15	2,80	3	15	1,62
1	12	2,02	3	12	1,24
1	9	1,80	3	9	1,82
1	6	1,18	3	6	1,76
1	3	1,72			

at 4π : Vladimir, Micha, Mike, Clemens

remove unused Telescopes from OR's
↳ does not work
↳ program not responding
↳ Restarting - motherboard controll prog.
- data aquisition
- ~~spectrcall~~ (SpecTcl)
↳ not working
↳ need to restart SPDAQ33 & VME Crade

6.10 pm leakage current : E6T0 7.01 μA
E6T1 9.57 μA
E6T2 7.95 μA
E6T3 6.43 μA

↳ turn off discriminators & the OR's of unused telescopes

problems: maybe Hira-Trigger is not setoped very well

4.24 pm vacuum : Digital $1.7 \cdot 10^{-5}$ Torr
Analog $1.6 \cdot 10^{-5}$ Torr

turn on VME Crade

turn off pulser (down, left)

5.30 - powering CsI
- cooling system started
- biasing up to 10 V

- starting SpecTcL

- biasing up 80 V (CsI)

leakage current CsI	[mA]	Voltage [V]	6 pm	Leak. cur. [μA]	Voltage [V]
CsI 2	0.0	80		0.0	80
CsI 1	0.3	79.6		0.3	79.6
CsI 0	0.0	80.15		0.0	80.15
CsI 3+4	0.1	80.10		0.1	80.1

dE

4.38pm	PA	Leakage current [μA]	Voltage [V]	6pm	Leak. cur [μA]	V [V]
	14	0.2	7.1		0.2	7.1
	11	0	6.95		0.0	6.95
	13	0	7.75		0.0	7.8
	10	0	7.85		0.0	7.85
	12	0.4	7.85		0.5	7.9
	19	0.0	10.35		0.0	10.4
	16	0	6.0		0.0	6.0
	17	0.1	6.85		0.1	6.85
	4	0	6.95		0.0	6.95
	3	0.2	7.05		0.1	7.05
	9	0	6.60		0.0	6.6
	6	0	6.65		0.0	6.65
	8	0	6.85		0.0	6.85
	5	0	8.65		0.0	6.65
	7	0.2	5.70		0.2	5.7

⇒ setuped everything
↳ looking in dE's & E's
↳ α-rate is very low

↳ maybe event mismatch on data

4.46pm → data mismatch on tower 0

tower 1 - Chip 5 & 6
tower 2 - Chip 13
tower 3 - Chip 5, maybe 13
} very noisy

↳ thresholds ??
↳ trying to increase thresholds of noisy chips

↳ tower 2 improved

tower 4 - Chip 9
tower 3 - Chip 10
} very noisy !!

↳ increase thresholds

4.55pm

plug in the complete signal

still noise on tower 0

- tower 0 removed from OR's only
5.03 pm - turned off from discriminators (first 4 chips)

→ it helps!

→ turning on first 4 chips & turning off all others on discriminators

→ turning on first 2 chips
→ trying to find the noisy chip

→ 2nd chip seems to be noisy
→ It's really the second chip that's noisy
→ Raised threshold as much as poss. on all it helps.
→ Removing all ES from OR's
→ Want to see if good data just with dE's
→ Realized we're not triggering on dE's, that's why low rates.
Moving OR's from dE to ORC.

5.22 pm

NOTE Quadrupols before 4π - Vault are turned on
Gatevalve to Upstream - beamline is open.

5.40pm still can't see the α's

removing the OR's from electronics

connection failed to telserver

changing cable (was not grounded) in trigger - logic

Suspect there may be additional source of n

6pm Look pg 26 for IV leak. C,

Leakage current:

EB T0	6.4	MA
EB T1	8.76	—
EB T2	7.72	—
EB T3	8.13	—

tower 5 is working fine

↳ adding tower 4, but it crashed

tower 4 is working for 10 seconds, than doesn't work anymore

6.15 pm vaccum: Digital: $1.7 \cdot 10^{-5}$ Torr
Analog: $1.55 \cdot 10^{-5}$ Torr
temp: 72.5 F

Softstart VME-Cradle

set gains & thresholds for CsI, which were undefined until now. → maybe it helps

18.30 pm softstart VME-Cradle

noise is still there

turn on all chips but one (slot 15) from tower 5
↳ waiting & looking, if it works

prob: board 4 - chip 13 & 14

6.50 starting counting alphas → looking if it crashes

maybe one chip broken

7.08 pm starting counting again

7.12 pm turning off clima - room-cooler (air conditioning)

7:20 pm temp 72.5° F
vacuum $1.6 \cdot 10^{-6}$ Torr (digital)

	Leakage Currents (μA)	Voltage (V)
EbT0	6.10	
EbT1	8.43	
EbT2	7.84	
EbT3	5.95	

dE	PA		
	14	0.2	7.10
	11	0.0	6.95
	13	0.0	7.00
	10	0.0	7.05
	12	0.4	7.85
	19	0.6	10.40
	16	0.0	6.00
	17	0.1	6.85
	4	0.0	8.95
	3	0.1	7.05
	9	0.0	6.60
	6	0.0	6.65
	8	0.0	6.85
	5	0.0	8.65
	7	0.2	5.70

E:

Tower	Card	Current (μA)	Tower	Card	Current
0	15	.58	3	15	1.44
0	12	1.66	3	12	1.10
0	9	1.76	3	9	1.56
0	6	2.08	3	6	1.84
1	15	2.42			
1	12	1.88			
1	9	1.64			
1	6	1.00			
1	3	1.40			
2	15	1.50			
2	12	1.84			
2	9	2.88			
2	6	1.62			

7:40 pm CSI:

	Voltage (V)	leakage I (μA)
2	80.00	0.0
1	79.60	0.3
0	80.15	0.0
3+4	80.10	0.1

7:50pm inspecting shaper ~~test~~ output from T4 chip 14
found nothing suspicious

7:53pm recording data
run 219
everything ~~biased except~~ biased, all disc on except T4C14
dE's & E's, α-calibration
triggering on OR A (dE discriminators)

8:23pm temp 74.0°F
vacuum (digital) $1.6 \cdot 10^{-5}$ torr
vacuum (analog) $1.5 \cdot 10^{-5}$ torr

8:56pm completed run 219
want to do similar run, but w/ all
E's & dE's
moving all dE's to OR C, which has E's
so run 220 will trigger on OR C, E's & dE's
E's & dE's

9:32 E's

Tower	Card	Current (μA)	V
0	15	.56	/0.56
0	12	1.64	1.66
0	9	1.72	1.70
0	6	2.02	2.02
1	15	2.40	2.40
1	12	1.06	1.82
1	9	1.66	1.68
1	6	0.90	0.96
1	3	1.38	1.38
2	15	1.46	1.46
2	12	1.80	1.78
2	9	3.24	2.14
2	6	1.62	1.64

Tower	Card	Current	
3	15	1.40	/1.20
3	12	1.08	/1.08
3	9	1.56	/1.56
3	6	1.86	/1.88

d
t 22.3

9:40pm Tower 2 card 9, leakage current has increased dramatically in last 2 hours
dying?
telescope 13
also Tower 2 card 8
inspecting w/analog inspect

9:45pm temp 75.7°F
vacuum (digital) $1.6 \cdot 10^{-5}$ torr

EbT0	5.97	μA leakage
EbT1	8.30	" "
EbT2	8.15	" "
EbT3	5.90	" "

9:50pm Lowered bias by 50V, didn't help
100V, 150V

10:20pm Decided to turn off telescope 13

Start threshold testing for Ef, Eb, dE

10:45pm Unbiasing everything, in order to disconnect telescope 13, which has too high leakage current even at 100V
Tower 2 Card 8 & 9 disconnected

11:00pm checking: no leakage current on Tower 2 Card 9 @ 250V
also disconnecting telescope zero from Tower 0

leakage current on Tower 0 Card 15 even when disconnected, with 50V bias
⇒ suggests the card, not the telescope problem
Checking with an inspect channel

Accidently unplugged Tower 1 slot 15 instead of Tower 0 with Tower 0 slot 15 unplugged, no leakage current telescope 0
when cable unplugged from flange, still see noise ⇒ there's a leakage current
is the cable the source of the noise? Microphonics?

11:30pm Replaced cable with another, still disconnected from flange
still have noise.
⇒ problem on Tower 0 slot 15 is chip board

Try to remove chip from Tower 2 slot 9
and put into Tower 0 slot 15
Also remove Tower 2 slot 8

SN0028 replaced by PS0131
(was in Tower 0 slot 15 ↓
was in Tower 2 slot 9

PS0040-A was in Tower 2 slot 8

11:50pm removals and replacements successful

jumper missing in Tower 3 slot 12
putting one in

12:00pm temp 74.4°F
vacuum $1.6 \cdot 10^{-5}$ torr

8:45am temp 74.7°F
vacuum $1.5 \cdot 10^{-5}$ torr

leakage current variation (as of 11/20/2006)

4:57AM 11/21

Tower	Slot	I [nA]				↓
0	15	0.76	0.7[illegible]	0.76	0.76	0.74
0	12	1.64	1.6[illegible]	1.66	1.70	1.64
0	9	1.76	1.74	1.74	1.76	1.62
0	6	2.04	2.[illegible]	2.04	2.08	1.98
1	15	2.40	2.42	2.46	2.44	(2.44) ?!
1	12	1.86	1.86	1.90	1.90	1.84
1	9	1.66	1.66	1.72	1.68	(1.80) ?!
1	6	1.00	0.98	0.98	1.00	0.96
1	3	1.42	1.38	1.40	1.42	1.36
2	15	1.50	1.48	1.48	1.50	1.40
2	12	1.80	1.80	1.80	1.84	1.78
2	9	0.00	0.00	0	0.00	0.00
2	6	1.68	1.66	1.68	1.70	1.62
3	15	0.02	0.02	0.02	0.02	0.02
3	12	1.12	1.10	1.10	1.12	1.06
3	9	1.58	1.58	1.60	1.62	1.52
3	6	1.82	1.90	1.92	1.96	1.86

↑ at 1:05AM T=75.0°F ↖ at 2:30AM T=75.5°F ↑ 11:43AM (11/20/2006) shortly after newly biasing up

11/21/06

9:25am Computer for experiment data:

have to backup data by ourself ?!

tape: use **LTO2**

high density LTO2

dd daqtap2 → use to pull it of

use **tapehost** to read out

10:00 Started writing data on tape

experiment > tar cvMf /dev/sto .

./current/03045_Shap.dat : Cannot stat: No such file or directory.

(Same for /03045_disk.dat)

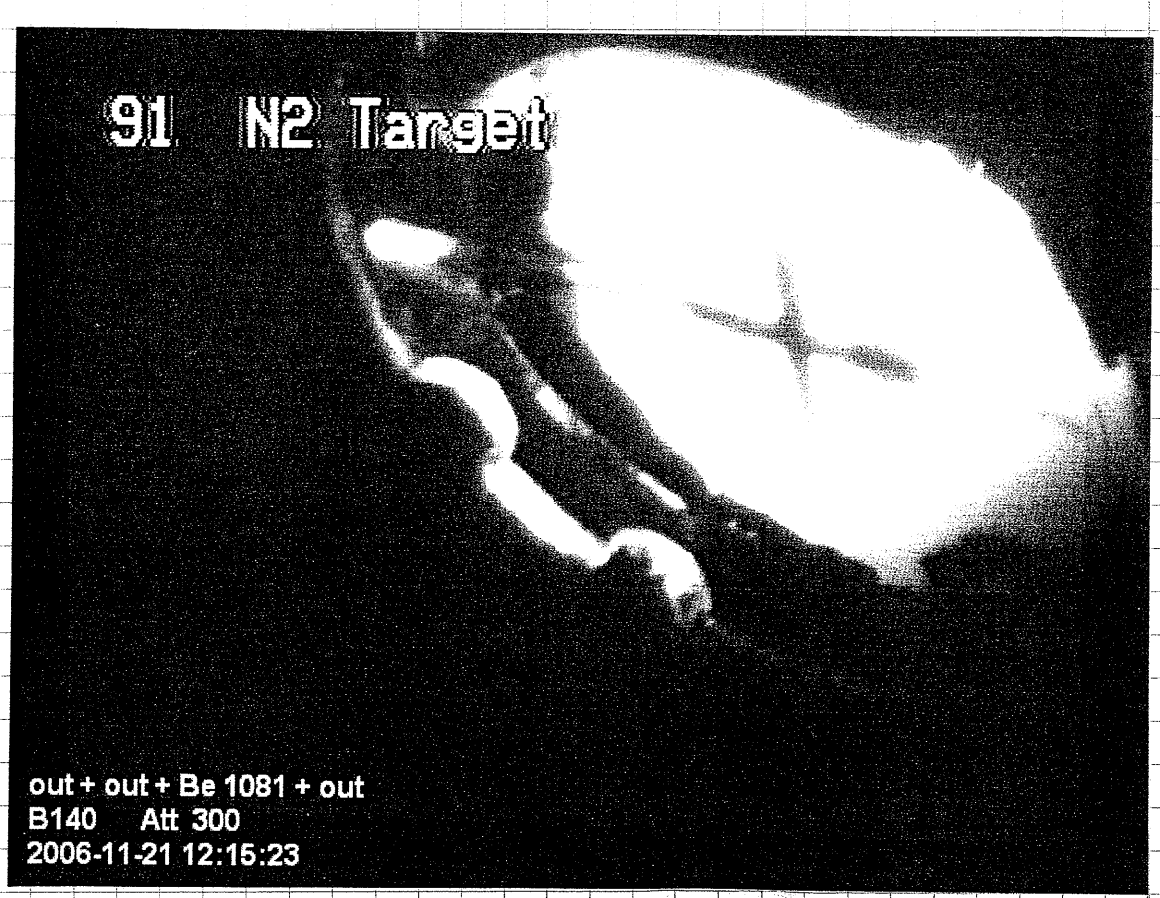
Exited with message
tar: ./run1/run1409r.evt: Cannot stat:
No such file or directory
tar: Error exit delayed from previous
errors

The process of writing to tape
too 45 minutes.

10:45am Copying from tape to /evtdata/030
<tapehost:/evtdata/030457 tar Mxf
/dev/st

12:05 ATT → N2 vault secured, ready to take + tune the beam

→ target viewer inside the 45



12:20 beam centered on the viewer

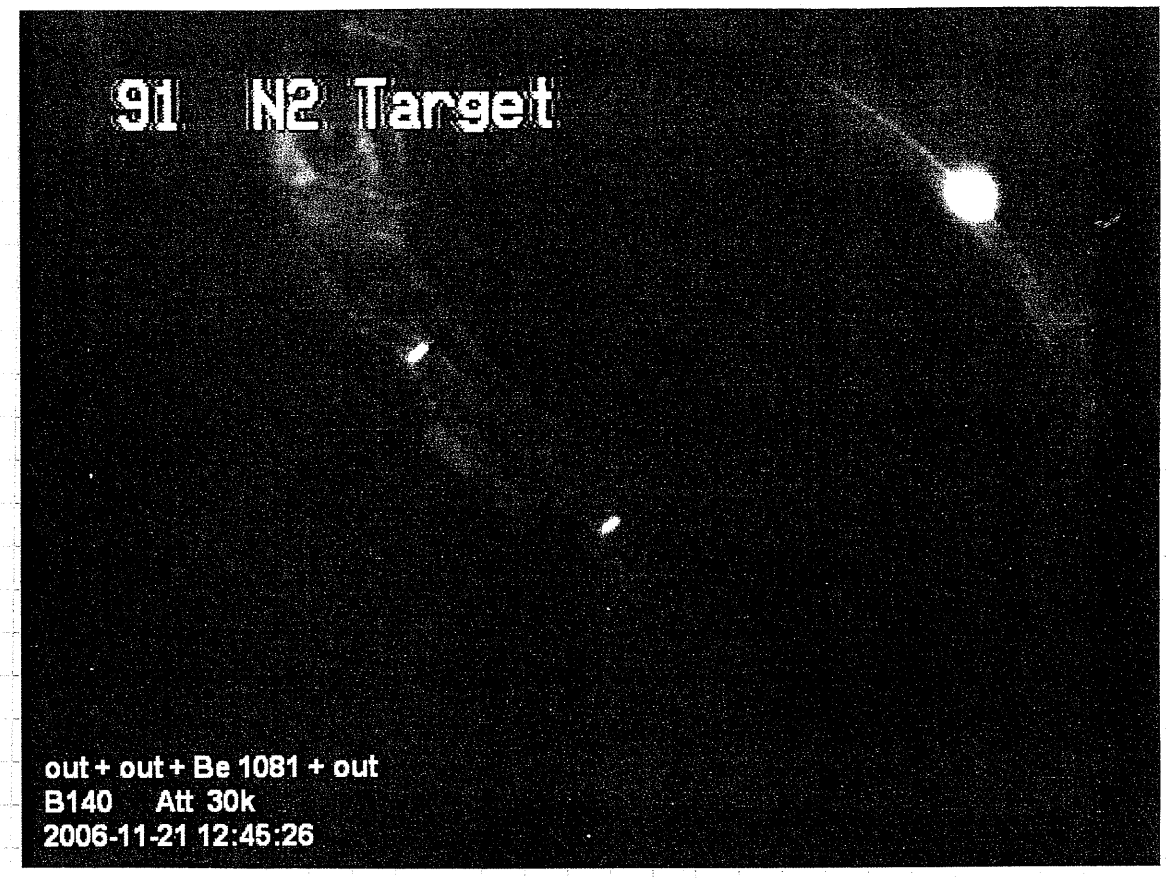
energy estimated by Tom Ginter → ^{40}Ca @ 79.8 MeV/u

→ inserting "empty target frame" in 41

↳ ready to run but SCALERS DO NOT WORK PROPERLY

↳ mismatch in reading: neighboring channels get same counts, module 5 gets counts.

↳ we have to run "old" readout right now



blank

Now: steering beam left/right, up/right → optimizing position

RUN223: Target in/out reference → "empty target frame", XFP at 15 mm
att. factor 3

RUN224: Empty target frame - data (to get multiplicity distribution, id, etc...

↳ we observe that "odd A" and "even A" channels missing, we exit and did reconnect two ribbon cables

RUN225: repeating RUN224, hopefully now all is connected.

↳ seems not!!

↳ half of even A's still

↳ it seems that the splitter box went bad!!!

FA	Run223	Run226	ratio
1	2215	517912	
2	2137	521343	
3	2091	516217	
4	2014	519705	
5	1822	488646	
6	1894	497262	
7	1710	462356	
8	1757	453269	
9	852	156238	
10	1985	453097	

```
A1900 "Print21Nov06_13h50.txt"   Tuesday 13:50:42 2006-11-21  A1900
Moe V3    ***  E R223 40Ca(20+)@79.8MeeV/u empty frame ***
Expt: 03045 "Two-particle Correlation Functions" [W. Lynch] Line: 4Pi Detector
Beam: 40 Ca 8+  12.35 MeV/nuc (K500) 20+ 140.00 MeV/nuc (K1200)
<Att   30>  ECR, Apertures: SCECR 150.0; 50.0; 25.0 mm SHVBI: 21.3800 kV
K500 a,b:    564 A,    433 A K1200:    689 A,   -214 A RF:  23.22390 MHz
       A1900 Optics: G19N2V1.data
       Rigidity       Field     Radius       (live)  Difference (Field*Radius)
Seg 0:  3.53650 Tm
Seg 1:  2.62500 Tm  0.84712 T  3.09882 m    3.09873 m    0.00303 % (2.62508 Tm
Seg 2:  2.62500 Tm  0.84635 T  3.10148 m    3.10154 m   -0.00204 % (2.62495 Tm
Seg 3:  2.62500 Tm  0.84794 T  3.09559 m    3.09574 m   -0.00482 % (2.62487 Tm
Seg 4:  2.62500 Tm  0.00000 T  3.09655 m    0.00000 m  100.00000 % (2.62487 Tm
Seg 5:  2.62500 Tm
Z108DS              -0.79900 T  3.28494 m    3.28536 m   -0.01268 %
Z001TL: out, Z013TL: out; Z014TL out
Z015TL: Be 1081, Z016TL out
Z030BC Beam Stop: -126.75 mm
Z037L,R:  -11.97,  14.02 mm; Z037DC:  out
Z057MS: 18 mm Cu, Z061MS: out
Z059DC: out, Z062SC: out, Z059TL: out
Z082 XC,G,YG:    1.17,  19.68,  20.03 mm Z082TL: out
Z101DC: out, Z102DC: out; Z103DC: out, Z105SC: out
Z104TL: out, Slits: nothing installed; PPACs: gas flowing
B110 Cent,Gap:    1.74,  14.08 mm; D110   -0.00,  -0.01 mm F110    0.01,    0.2
B110DC: out, D110DC: out, D111DC: out, F110DC: out
```

2:58PM Ni target inserted

Run226 Target in/out reference - "Ni target", XFP at 15 mm, "Ca beam, att.

↳ Target in/out ratios seem to be very good ~ 3-4 ‰


```
A1900 "Print21Nov06_15h01.txt"   Tuesday 15:01:39 2006-11-21  A1900
Moe V3    ***     E R226 40Ca(20+)@79.8MeeV/u Ni tgt in ***
Expt: 03045 "Two-particle Correlation Functions" [W. Lynch] Line: 4Pi Detector
Beam: 40 Ca 8+  12.35 MeV/nuc (K500) 20+ 140.00 MeV/nuc (K1200)
<Att   30>  ECR, Apertures: SCECR 150.0; 50.0; 25.0 mm SHVBI: 21.3800 kV
K500 a,b:     564 A,     433 A K1200:     689 A,    -214 A RF:  23.22390 MHz
       A1900 Optics: G19N2V1.data
       Rigidity        Field     Radius        (live)  Difference (Field*Radius)
Seg 0:  3.53650 Tm
Seg 1:  2.62500 Tm  0.84712 T  3.09882 m    3.09872 m    0.00330 % (2.62509 Tm
Seg 2:  2.62500 Tm  0.84634 T  3.10148 m    3.10159 m   -0.00347 % (2.62491 Tm
Seg 3:  2.62500 Tm  0.84793 T  3.09559 m    3.09577 m   -0.00590 % (2.62485 Tm
Seg 4:  2.62500 Tm  0.00000 T  3.09655 m    0.00000 m  100.00000 % (2.62485 Tm
Seg 5:  2.62500 Tm
Z108DS             -0.79900 T  3.28494 m    3.28536 m   -0.01268 %
Z001TL: out, Z013TL: out; Z014TL out
Z015TL: Be 1081, Z016TL out
Z030BC Beam Stop: -126.75 mm
Z037L,R:  -11.97,   14.02 mm; Z037DC:  out
Z057MS: 18 mm Cu, Z061MS: out
Z059DC: out, Z062SC: out, Z059TL: out
Z082 XC,G,YG:     1.07,   19.68,   19.91 mm Z082TL: out
Z101DC: out, Z102DC: out; Z103DC: out, Z105SC: out
Z104TL: out, Slits: nothing installed; PPACs: gas flowing
B110 Cent,Gap:    1.74,   14.08 mm; D110   -0.00,    0.11 mm F110   -0.01,    0.2(
B110DC: out, D110DC: out, D111DC: out, F110DC: out
```

11/21 3:30pm detector stats

Es

Tower	Cond	V(V)	leakage (μA)
0	15	189.75	.76
0	12	250.25	1.72
0	9	199.75	1.78
0	6	200.00	2.10
0	3	0.00	0.00
1	15	240.00	2.54
1	12	339.75	1.92
1	9	360.00	1.80
1	6	209.50	1.00
1	3	314.75	1.44
2	15	244.75	1.52
2	12	339.75	1.86
2	9	0.50	0.00
2	6	150.75	1.74
3	15	0.25	0.02
3	12	210.25	1.12
3	9	310.50	1.64
3	6	160.00	1.90

Tower	Cond	V(V)	leakage (μA)
2	15	189.75	
2	12	250.25	
2	9	199.75	
2	6	200.00	
3	15	240.00	
3	12	339.75	
3	9		
3	6		

CSIs

	Voltage (V)	leakage (μA)
CsI2	80.05	0.0
CsI1	79.55	0.2
CsI0	80.20	0.0
CsI3+4	80.10	0.0

dEs

PA14	7.10	0.1
PA11	6.95	0.0
PA13	7.75	0.0
PA10	7.05	0.0
PA12	7.85	0.2
PA19	10.35	0
PA16	6.00	0.0
PA17	6.05	0.0
PA4	8.95	0.0
PA3	7.05	0.0
PA1	6.55	0.0
PA6	6.60	0.0
PA8	6.80	0.0
PA5	8.60	0.0

RUN227 - data for debugging 4π 5mTi Ni target
RUN228 — " —

3:45 Confusion - old Readout & new Readout
new readout - scalers not working correctly
⇒ Scalers Display
up to run 228 taken using old Readout
For tuning 4π, new Readout better
⇒ from now on use new Readout

4:20 Removed all files in event6 that are backed up in evt data.
Note: all runs < 90 caused SpecTcl to crash in both places

New SpecTcl not running (created yesterday to handle data structure from new 4π readout

4:40 Replaced splitter box for ↑ even A's with another 4π

Voltage currents: (17:05 PST / 11/21/2006)
Tow0 - ~~[illegible]~~
Tow1 - ~~[illegible]~~
Tow2 - ~~[illegible]~~
Tow3 - ~~[illegible]~~

T0	slot 15	0.78	T2	slot 15	1.52
	12	1.70		12	1.88
	9	1.78		9	0.00
	6	2.12		6	1.74
T1	slot 15	2.54	T3	slot 15	0.02
	12	1.92		12	1.14
	9	1.80		9	1.64
	6	1.00		6	1.98
	3	1.42			

RUN229 - new readout, runs

18:35

RUN 232 - Ni target - data for debugging 4π ; old readout

Note:
→ new readout still not accepted by SpecTcl, it's being worked on
→ next data will be taken,

RUN 233
RUN 234 > Ni target, debugging 4π

RUN234 → trigger by Ball OR FA, we see

RUN 236 —— 〃 ——

RUN 237 - another debugging run (with new readout to check Mark's mapping)

RUN 238 - another RUN → trigger Ball+FA — old readout

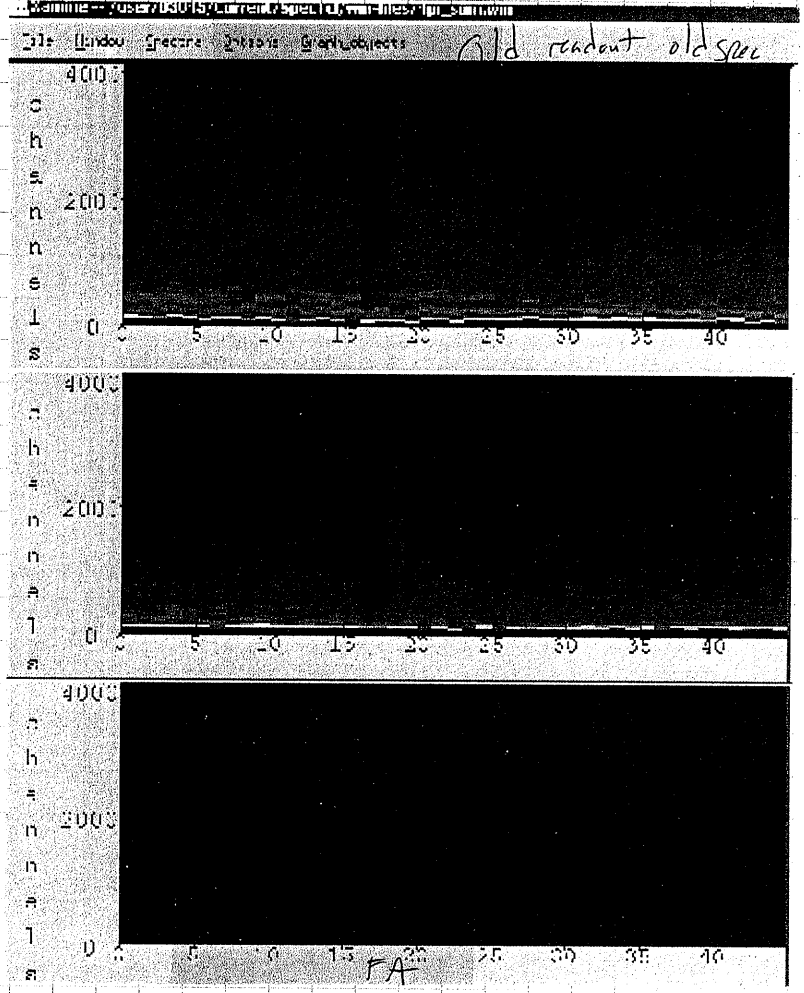
RUN 239 - old version of readout → debugging 4π 20:00 PT

RUN 240 - old version readout → trigger ?

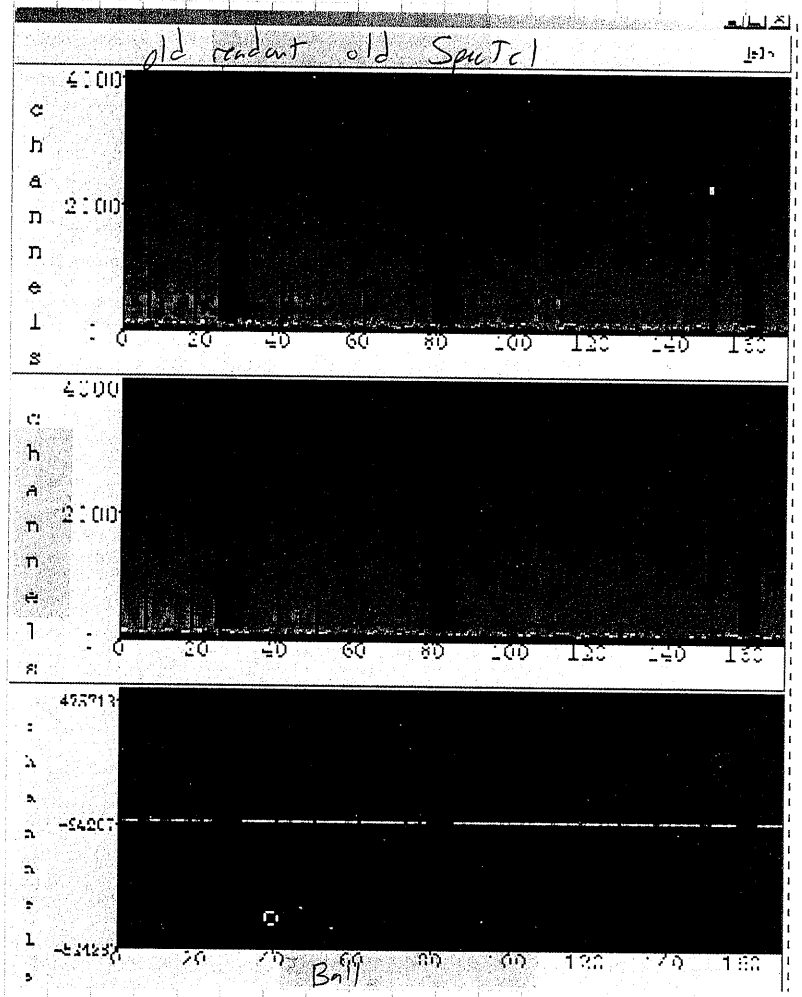
↳ Note: we realize that things should be not triggered but also gated

RUN 242 - old version readout : gate+trigger by FA, threshold ~ (32mV set to all

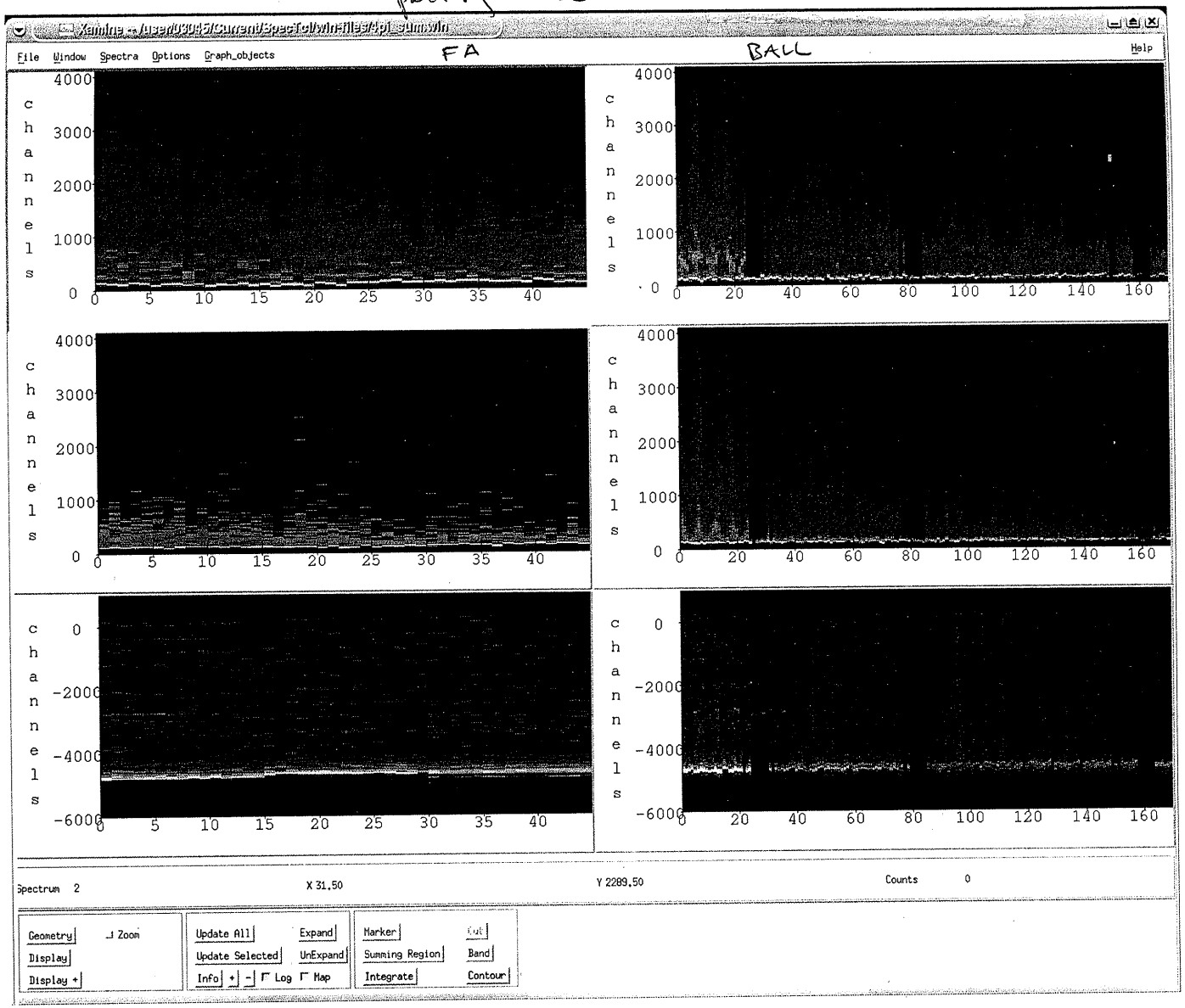
old readout old spec



old readout old Spectel



part of RUN242



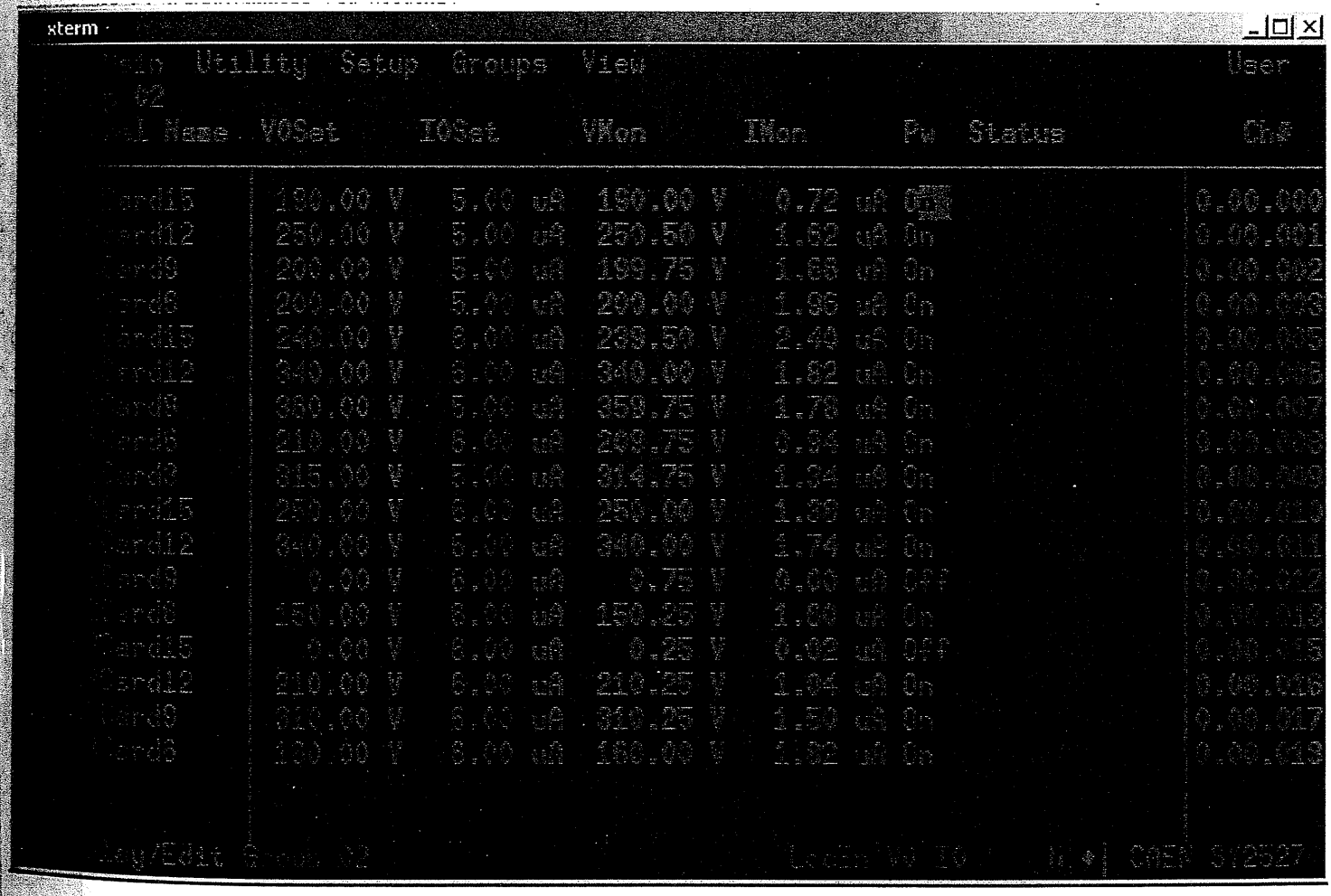
1:20 AM RUN 243 – no beam, first HiRA run, E-front trigg very high threshold.

RUN 244 – beam + HiRA → tuning HiRA, trigger HiRA w/ but 4π shield lowered

RUN 245 - 247 : tuning HiRA

10/22/06 9:30 am

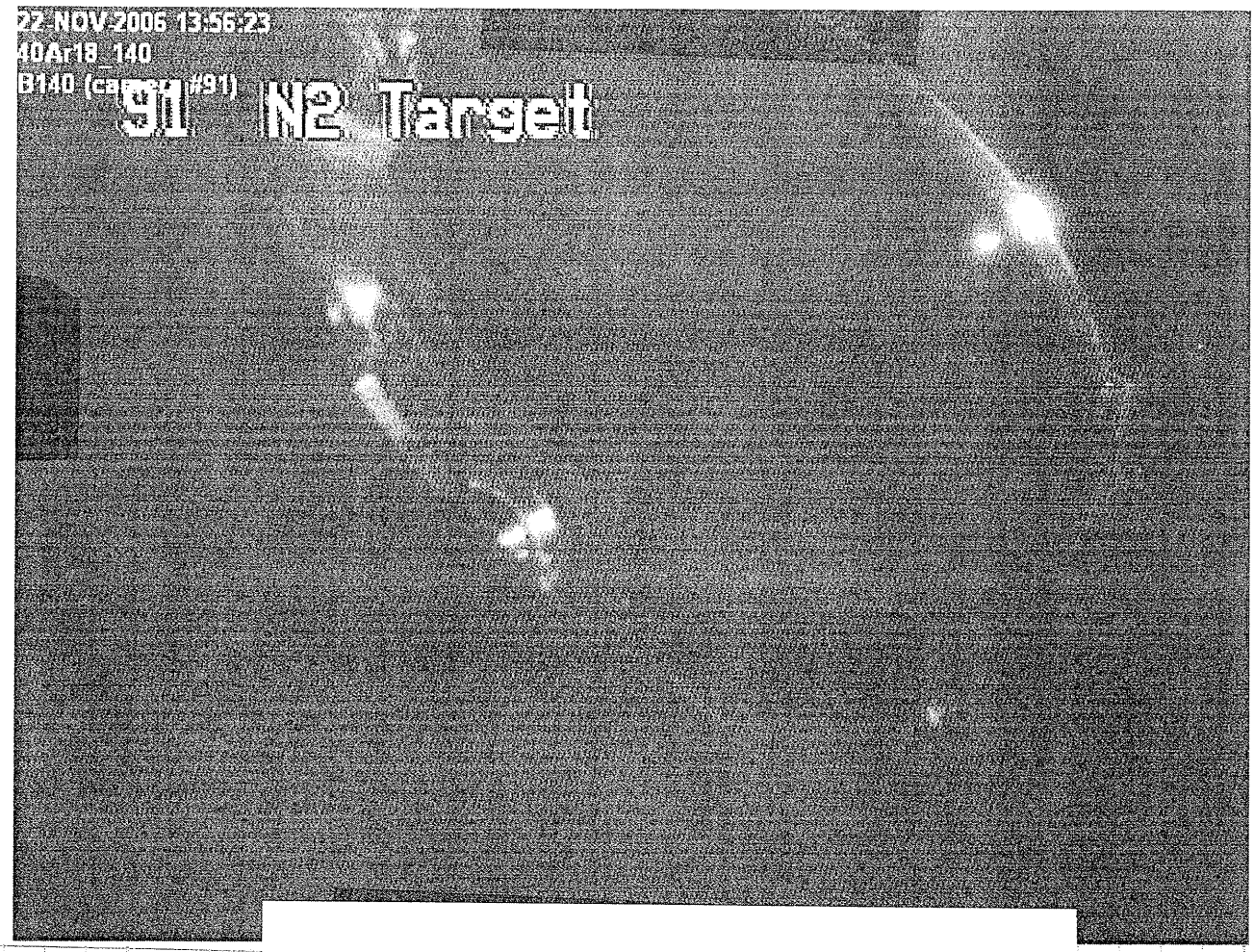
	Leakage	Voltage
Tower 0	@ 5.95	100
Tower 1	8.3	100
Tower 2	4.70	100
Tower 3	4.33	100

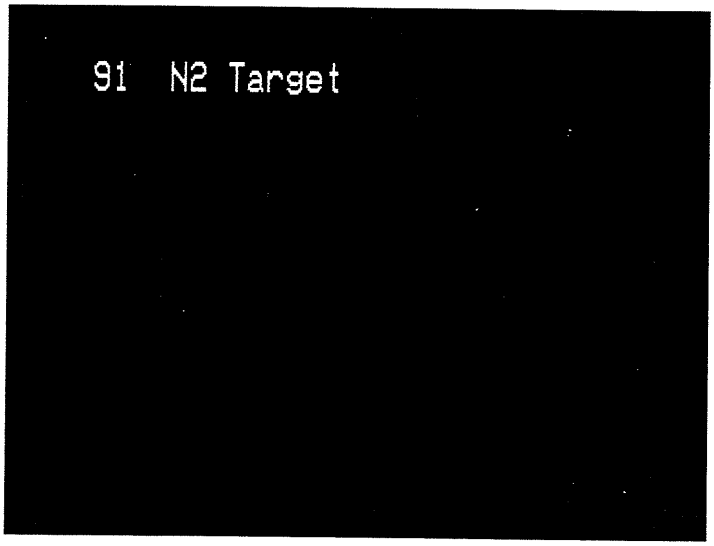


1:50p Temp 71.8F
Pressure 1.3E-5

2:00p

Plastic targe



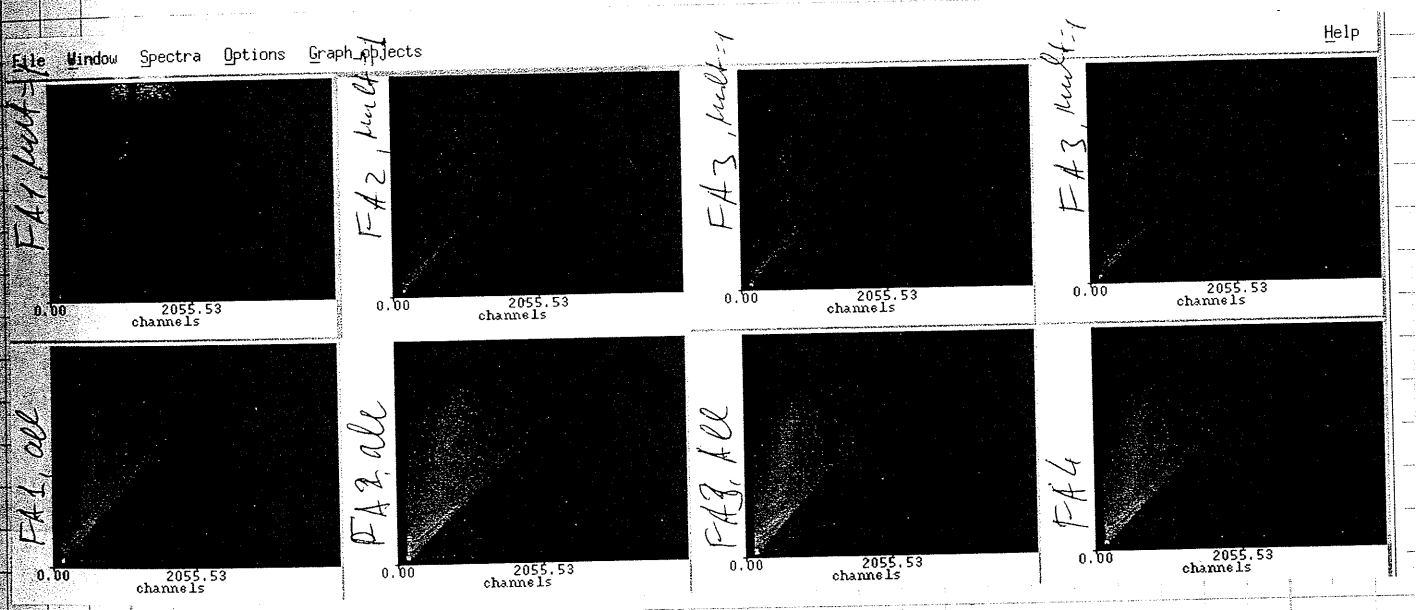


Run 257
2.15p

4π FA + Ball Pos 5 plastic 2.95 mg/cm²
40 Ca 80 MeV trigger on FA + Ball
checking.

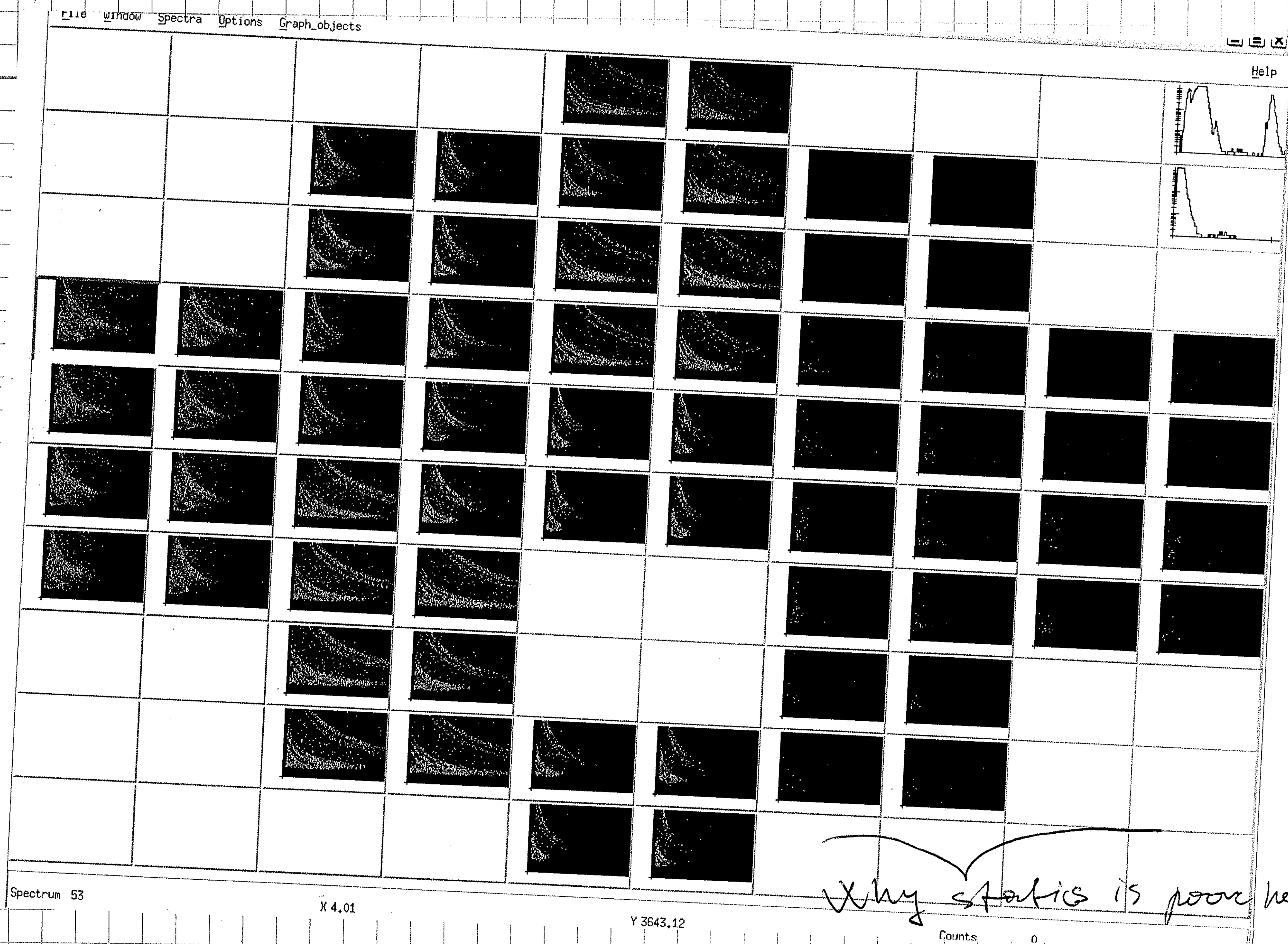
Run 258
2:40p

Same:
Trigger on FA Ball.



Dead time recorded
140 μs

Runs #247 ÷ 249



Why statis is poor here?

15.40 Scaler set to ~~45~~ 5 sec
Included 4π Master

16.28 Removed delay (QDC4) from 4π Premaste, to gain about 20nS for 4π fast gates.

16.50 Run 259 4π FatBall plastic target mult 2 - no hira

17:05 Last run/Attenuation 10k, Next run - att 1.

Run 260 4Pi FA+Ball, mult 2 - no hira Att - 1.
Threshold updated see next run

Run 261 4π FA+Ball, mult 2 - no hira
threshold changed to 16
to see pedestals on all QDC's.

Run 262 18:30 short run
Thresh. just above pedestals
Thresh are possibly mismatched

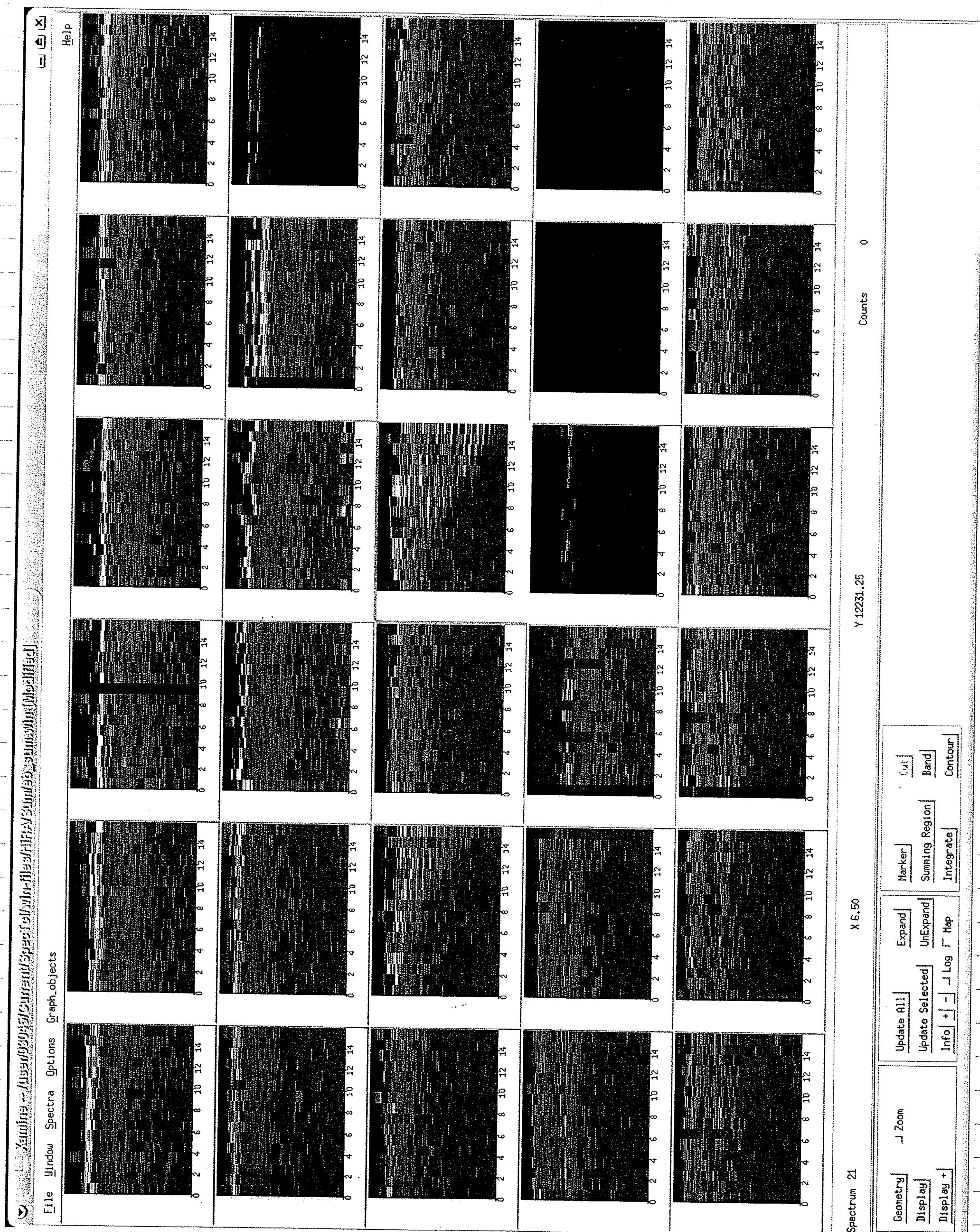
Run 263 7:00pm Mylar Target, 4π FA+Ball Singles, same beam

⇒ Mylar Target picture on page 53

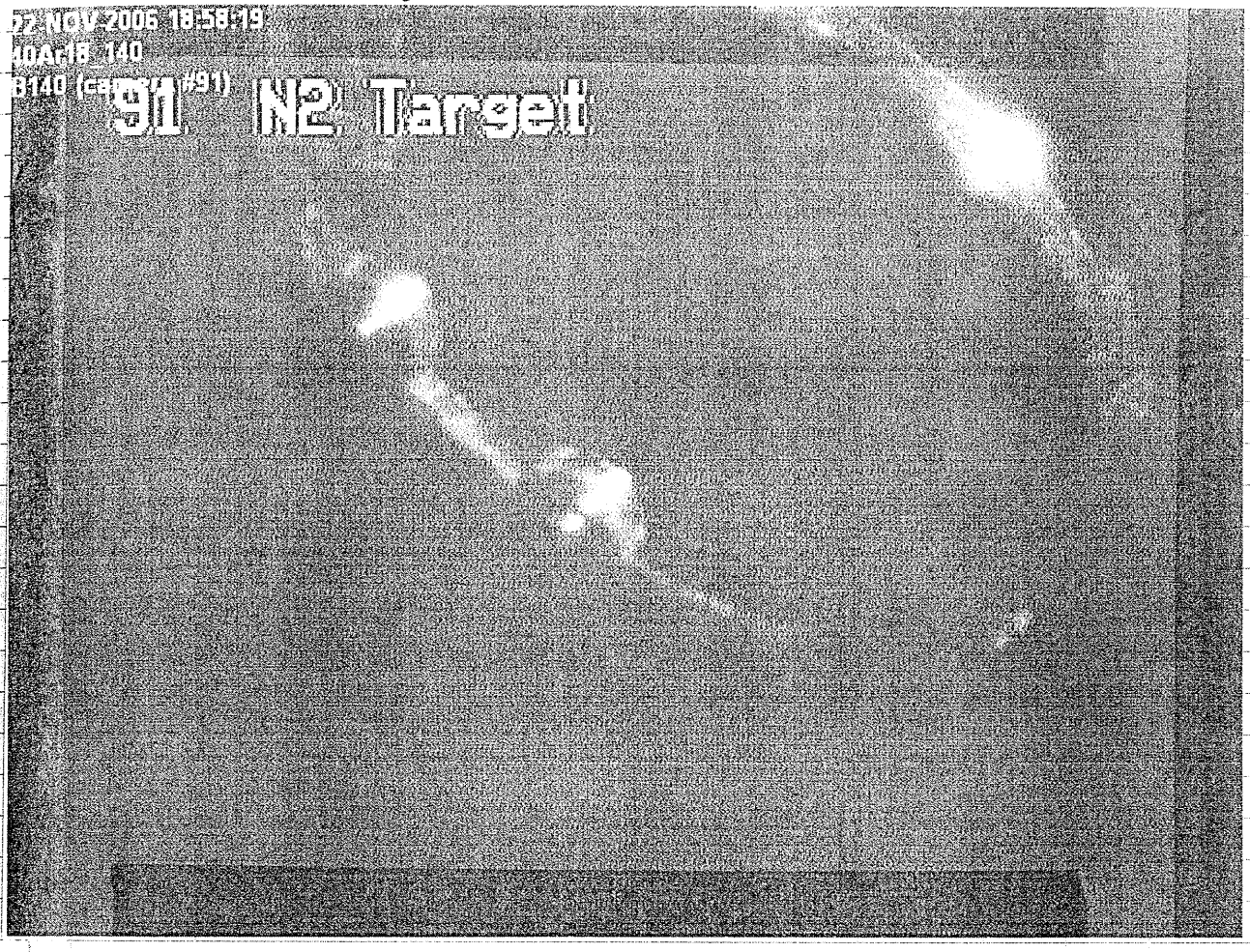
Run 264 7:15pm same as 263

trying to adapt QDC thresholds
Spectra shows mismatch, apparent structure

18:04


File
Window
Spectra
Options
Graph_objects
Help
Spectrum 21
X 6.50
Y 12231.25
Counts 0
Geometry
Display
Display +
Zoom
Update All
Update Selected
Info
Log
Map
Expand
UnExpand
Marker
Summing Region
Integrate
Cut
Band
Contour

Mylar target, inserted ≈ 19:00 11/22/06



7:20 pm
Run 265 save a 264, new QDC thresholds (optimizing)

Note: Calcium 40 target in transfer tube (w/ Argon) sitting in data-U

ending 265

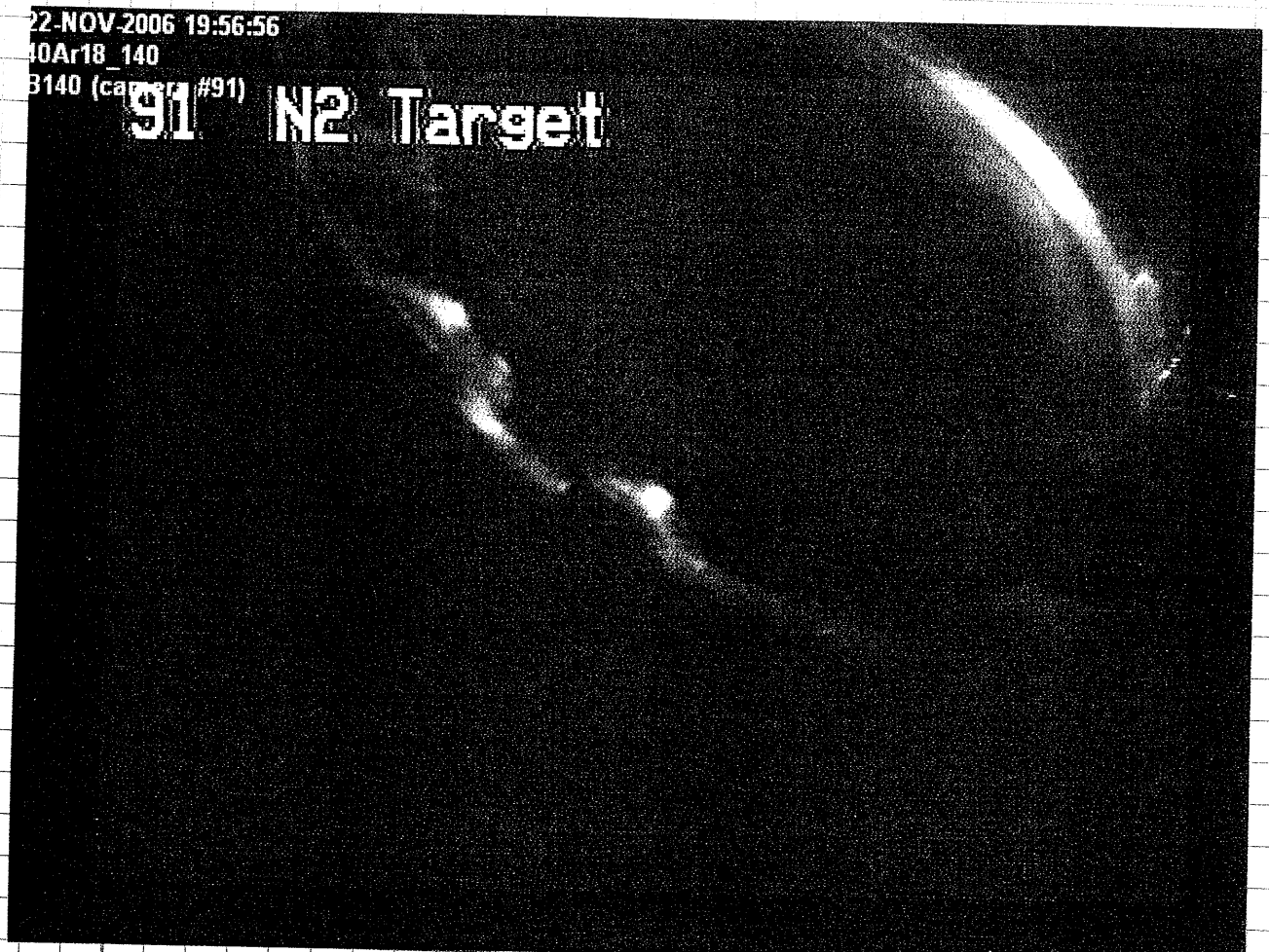
Run 266 save as 265, optimizing QDC thresholds

ending Run 266

putting in Calcium

54

8:00 Ca 40 target in



Converging on fixing thresholds

Run 267 4Pi eBall, multiplicity 2
Ca 40 target for multiplicity reference
still optimizing threshold

Run 260271 Same as 267, debugging & thresholds
Ca 40 target

2:00 group meeting
- Make 54Fe schedule
- thresholds
  - mapping problem
  - better than before but not great

meeting continued

- old/new Readout - which?
- need a plan, list of problems
  - which day?
    - → threshold control better on new
    - → speed issue → loss dead time on new
    - → debugging - new still needs more
  - strategy: take some data w/ Mikes program (new) and debug it
- Thresholds
  - CsI gain & thresholds
- Hits
  - missing chipboards
  - software missmapping
  - strange triangles
- Communication
  - report everything to shift boss
  - put in substantial changes in elog & logbook
  - Michaels list

10:40 changed Faraday cup BCM setting so max scale is 2 nA, thus beam current can be read as

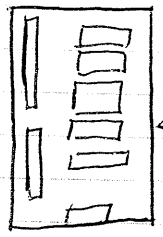
$$I = \frac{\text{Scaler level}}{1000} \cdot 2\,nA$$

current reading = 72 = .144 nA

Split into several groups after meeting
Vlad, Mike working on thresholds for 4pi
Betty, Andy, Mark working on channel mapping for silicons & CsI
Daniela working on 4pi spectra stuff
Bill getting food

Run 272 640 target
generating data to debug 4PI

* CsI are not routed to the pulser box as originally thought.



1:21 AM Investigation of bad PID's in 4π → such as P:D's of all "odd A" modules

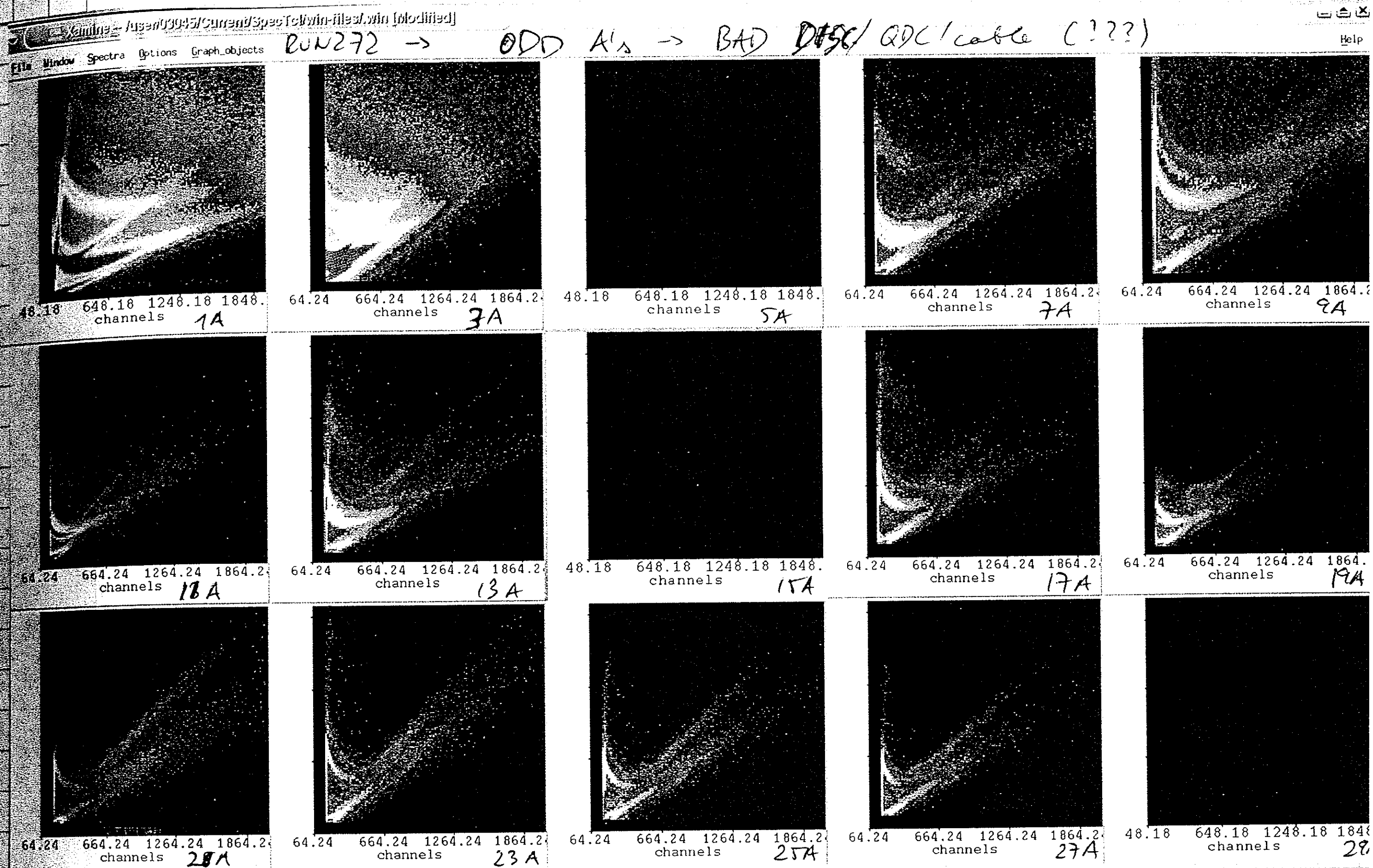
↳ 1D spectra of dE's and E's do not have any visible problems when compared to "even A"

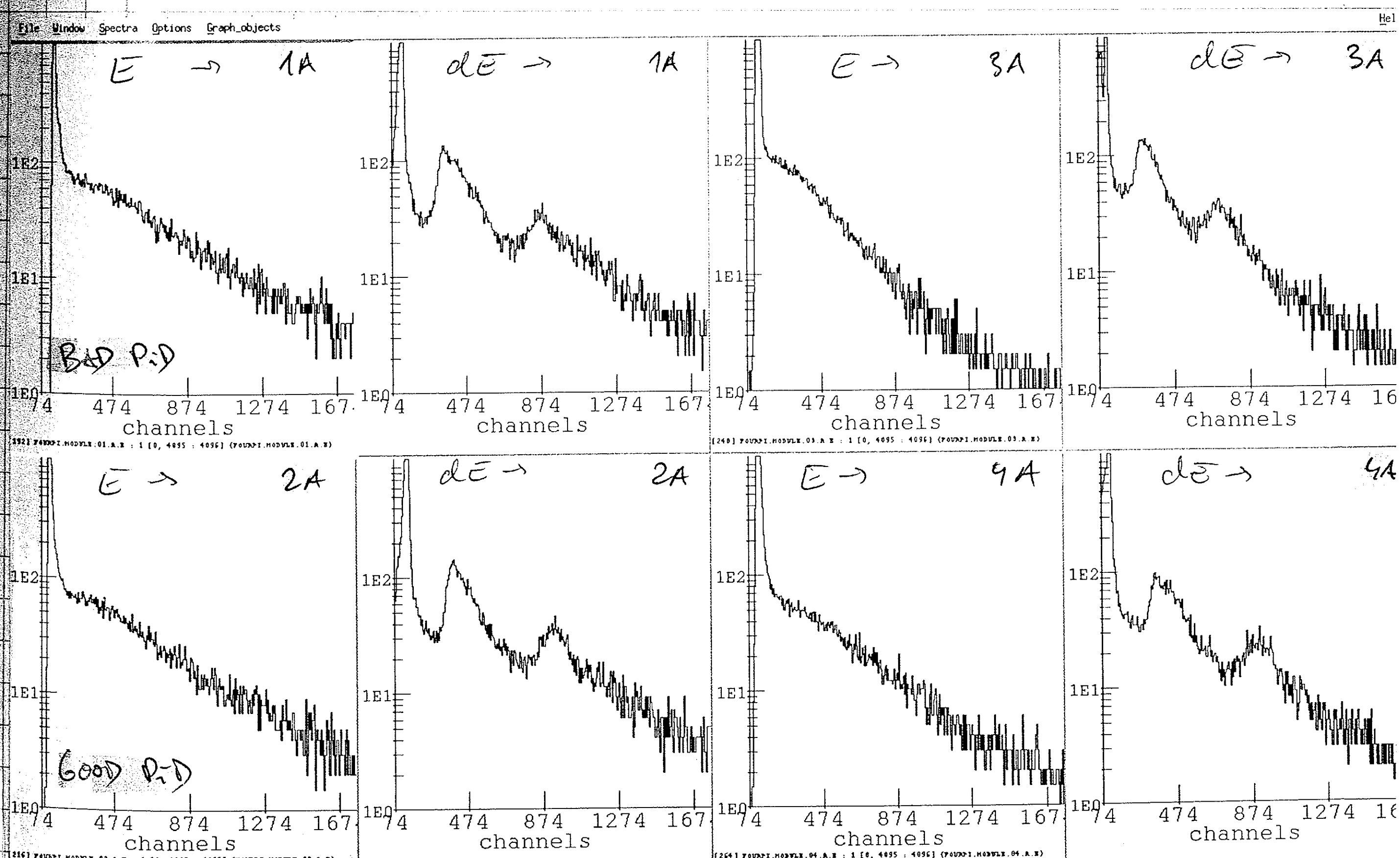
↳ P:D's of other modules mostly OK

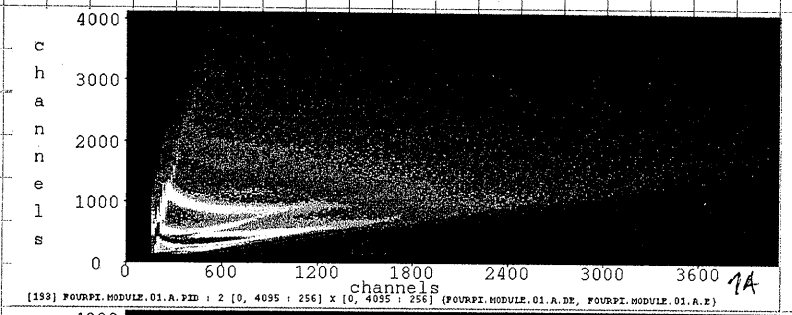
↳ see page 58 for all modules

RUN274 → very low thresholds at 4π → to see pedestals and better deduce thresh

[~3:00 AM] 2 discriminators exchanged → problem seems to be sol

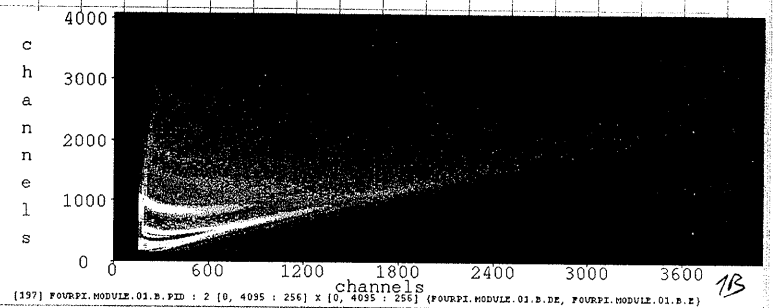

Xamine - /user/03045/Current/SpecTcl/win-files/.win [Modified]
File Window Spectra Options Graph_objects
RUN272 → ODD A's → BAD D?56/QDC/cable (???)
Help
48.18 648.18 1248.18 1848.
channels
1A
64.24 664.24 1264.24 1864.2
channels
3A
5A
7A
9A
11A
13A
15A
17A
19A
21A
23A
25A
27A
29


File Window Spectra Options Graph_objects
Help
E → 1A
dE → 1A
E → 3A
dE → 3A
E → 2A
dE → 2A
E → 4A
dE → 4A
1E2
1E1
1E0
74 474 874 1274 167
channels
BAD PiD
GOOD PiD



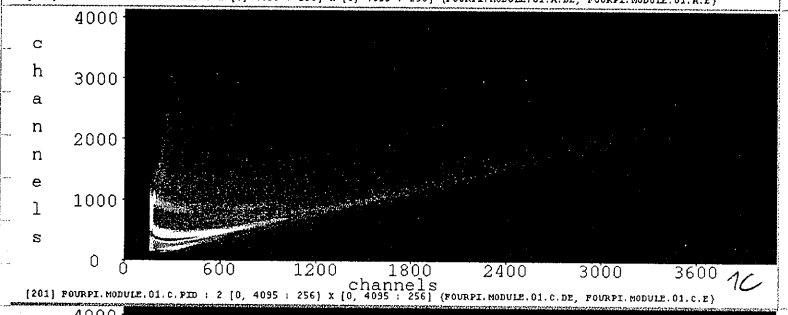
[193] FOURPI.MODULE.01.A.PID : 2 [0, 4095 : 256] X [0, 4095 : 256] (FOURPI.MODULE.01.A.DE, FOURPI.MODULE.01.A.E)

1A



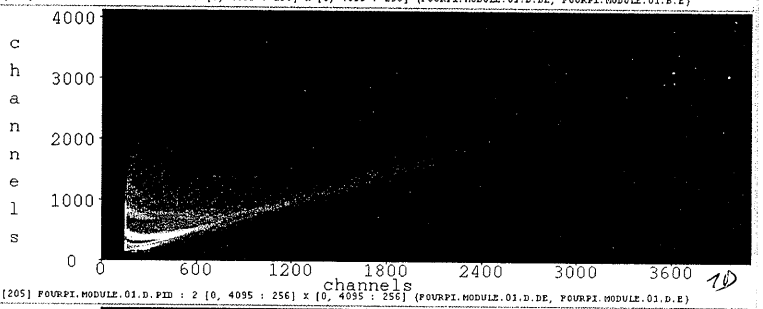
[197] FOURPI.MODULE.01.B.PID : 2 [0, 4095 : 256] X [0, 4095 : 256] (FOURPI.MODULE.01.B.DE, FOURPI.MODULE.01.B.E)

1B



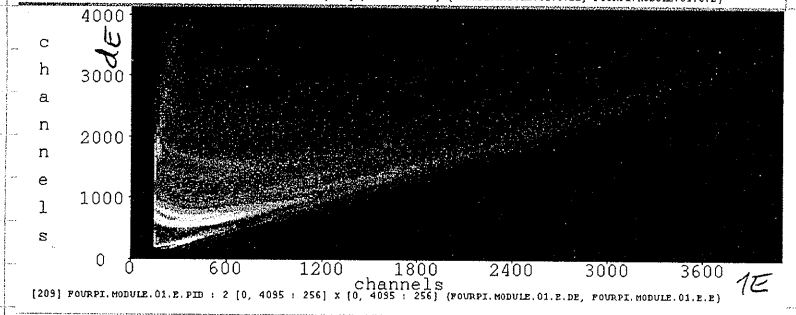
[201] FOURPI.MODULE.01.C.PID : 2 [0, 4095 : 256] X [0, 4095 : 256] (FOURPI.MODULE.01.C.DE, FOURPI.MODULE.01.C.E)

1C



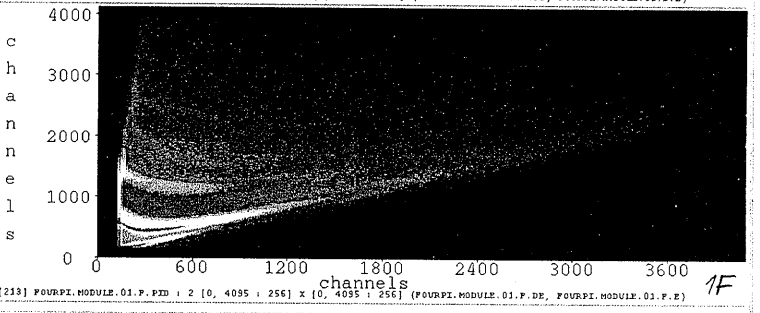
[205] FOURPI.MODULE.01.D.PID : 2 [0, 4095 : 256] X [0, 4095 : 256] (FOURPI.MODULE.01.D.DE, FOURPI.MODULE.01.D.E)

1D



[209] FOURPI.MODULE.01.E.PID : 2 [0, 4095 : 256] X [0, 4095 : 256] (FOURPI.MODULE.01.E.DE, FOURPI.MODULE.01.E.E)

1E



[213] FOURPI.MODULE.01.F.PID : 2 [0, 4095 : 256] X [0, 4095 : 256] (FOURPI.MODULE.01.F.DE, FOURPI.MODULE.01.F.E)

1F

Spectrum 205 X 8.03 ΔT-module 1 Y 3171.62 Counts 0

Geometry Zoom | Update All Expand | Marker Cut

Display Update Selected UnExpand | Summing Region Band

Display + Info + - Log Map | Integrate Contour

RUN272

7:03 AM → after long and painfull struggle, suffering heavy casualties and exhausted, we record first run with reasonable 4π+HEA coincidences!

↳ RUN 285
↳ att factor 30; 4π Ball thresholds set up, FA not yet

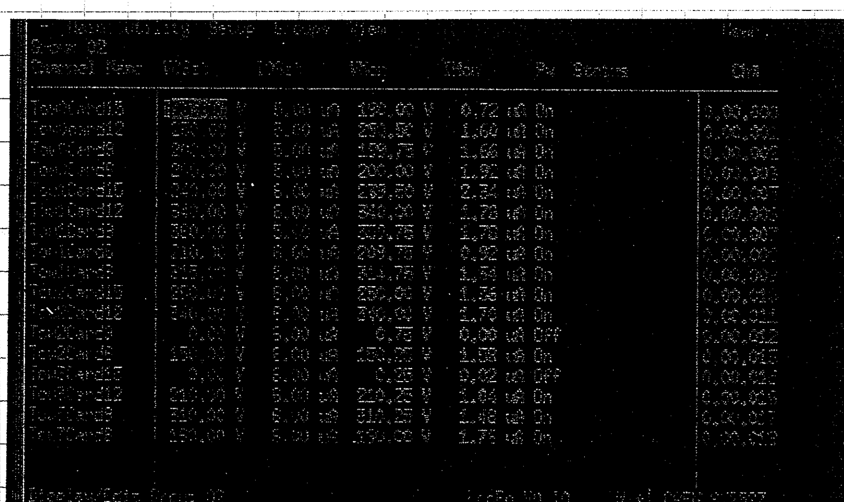
7:20 AM RUN 286 → thresholds improved, TDC set to 800 ns (before maybe 500
↳ accidently again bad thresholds ↳ no, it was ab...
↳ file bad

7:25 AM RUN 287 → hopefully now everything OK!

288 - same condition
289

after 10-15 min trigger rate becomes to zero??? We had to start new run, beam is O.K.

so runs 287, 288, 289, 290 have the same conditions



← leakage current situation as of 8:06 AM (11/23/2006)

9/4. Continue running 4π + Hira coin.
Noise in silicons seems manageble.

LED	Time (~~Back~~ timing)
Ch 16	3E
21	4D
31	6B
39	7E
49	9E
59	11E
71	13E
79	14E
95	17E
107	19E
119	21E
129	23E
135	25A
138	25D
146	27A
150	27E
151	27F

{ ~~HIRA~~ 5A – 5F

{ 15A ÷ Cryo

{ 29A – ?

E (dead)

Ch	
31	6B
76	14D
149	27D
150	27E

dE dead bad chs:

dE

TELEφ ch 24

01 O.K.

02 ch 11

03 ch 10, 16

05 ch 4, 12, 16 dead thr.

06 4, 12, 25 - dead ch 17 - threshold

08 OK.

10 ch 13, 28 - dead

11 ch 3 - low thr.

12. ch 4, 12 - dead

13 O.K.

16 ch 11, 29 - dead

07 4, 12, 30 - dead

EF

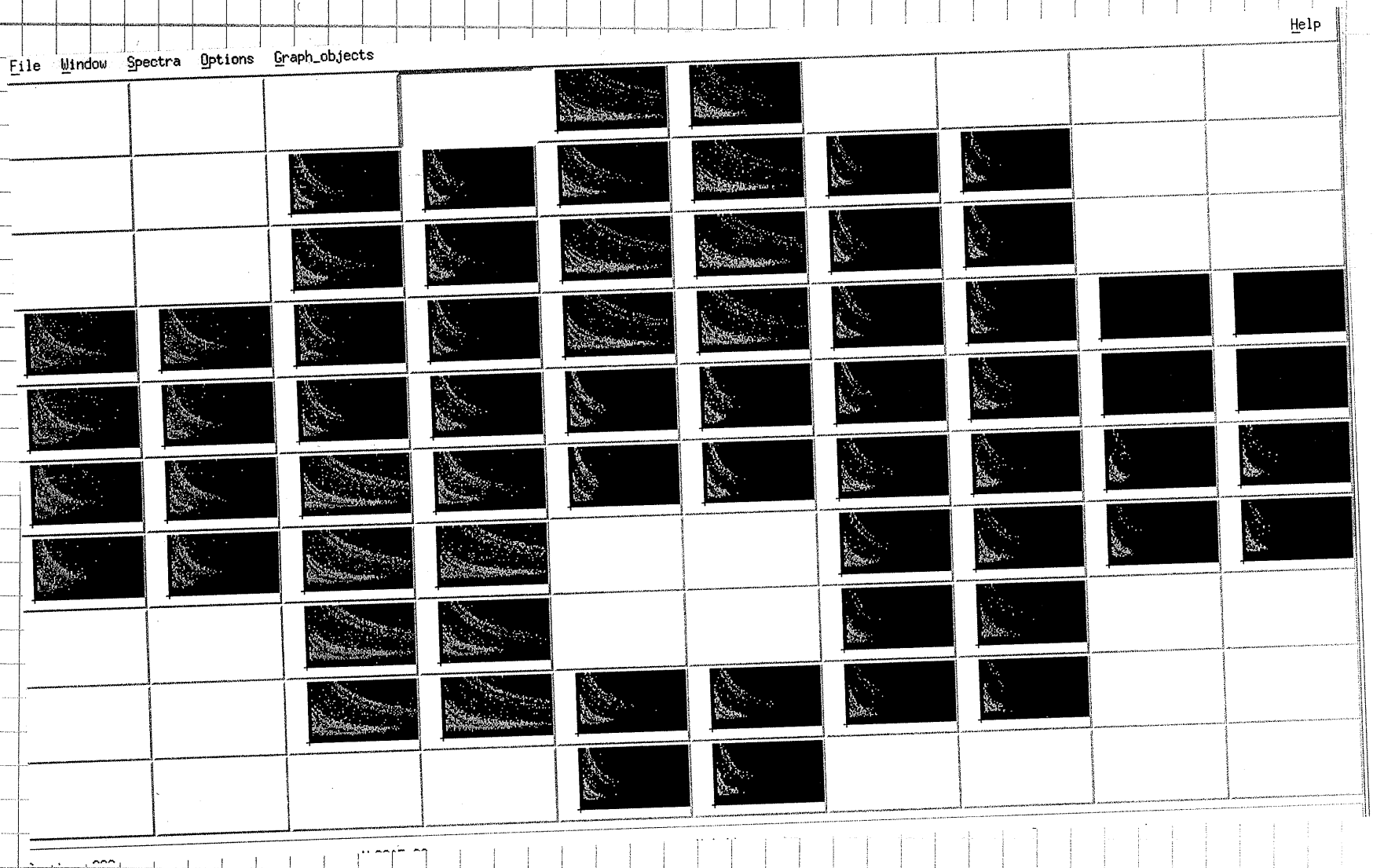
TELE 16, 1, 3, 5 ... 29; 31 - one dead

EB

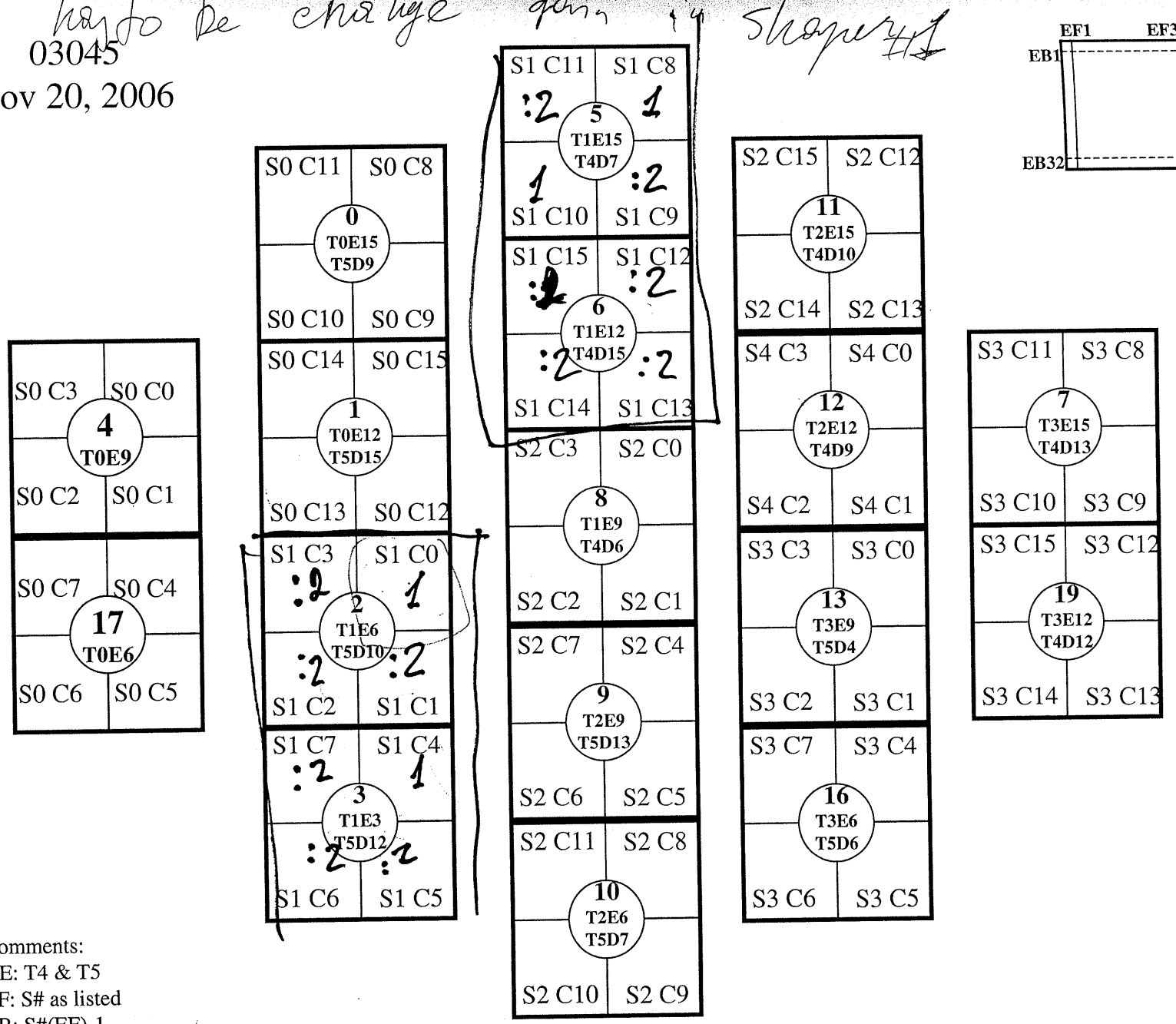
TELE 04 ch 18 dead 1, 4, - low thr.

03 all chs low threshold

TELE 11, 0, 2, 4, 6 - 30 - one dead


File Window Spectra Options Graph_objects
Help

03045
Nov 20, 2006



Comments:
DE: T4 & T5
EF: S# as listed
EB: S#(EF)-1

10:14am Changed gain on Shaper 0 chan 15 to 26
↕ Changed gain on Shaper 1 (all channels) to 5-6.

Run 292 (9:45am) 4π + Hira Debugging
Increased the width of 4π master. time to 160 ns. to get overlap with FA gate

Run 293 4π + Hira TDC 800 ns
~~Increase~~
11 am

Run 294 (11:30am) same as Run 293

Run 295 (11:42am) same as Run 293

Run 296 (11:49a) same as Run 293

Run 297 (12:10) Same as Run 293

Run 298 (12:40) Same as Run 293

Run 299] junk Changing FA/Bell thresholds
Run 300] junk

Run 301 ~ 10 min run to check thresholds.
probably shapers file not loaded in previous files

R 302 ~2pm new FA thresholds (minor adjustments)

R 303 Same as 302

Run 304 Junk

Run 305 Multiplicity changed to 2 on CsI's.

3:30p Previous runs were triggered Ball / FA, threshold 180 mv
Now 120 mv requested.

3:40p Beam increased 10 times, then 5 times, then decreased 5 times.

Run 308 running with 10 times beam intensity.

3:32

Main Utility Setup Groups View

Group 02

Channel Name	V0Set	I0Set	VMon	IMon	Pw	Status
Tow0Card15	190.00 V	5.00 uA	190.00 V	0.70 uA	On	
Tow0card12	250.00 V	5.00 uA	250.50 V	1.60 uA	On	
Tow0Card9	200.00 V	5.00 uA	199.75 V	1.64 uA	On	
Tow0Card6	200.00 V	5.00 uA	200.00 V	1.90 uA	On	
Tow1Card15	240.00 V	6.00 uA	239.50 V	2.38 uA	On	
Tow1Card12	340.00 V	6.00 uA	340.00 V	1.78 uA	On	
Tow1Card9	360.00 V	5.00 uA	359.75 V	1.80 uA	On	
Tow1Card6	210.00 V	6.00 uA	209.75 V	0.92 uA	On	
Tow1Card3	315.00 V	5.00 uA	314.75 V	1.34 uA	On	
Tow2Card15	250.00 V	6.00 uA	250.00 V	1.36 uA	On	
Tow2Card12	340.00 V	6.00 uA	340.00 V	1.72 uA	On	
Tow2Card9	0.00 V	6.00 uA	0.75 V	0.00 uA	Off	
Tow2Card6	150.00 V	6.00 uA	150.25 V	1.58 uA	On	
Tow3Card15	0.00 V	6.00 uA	0.25 V	0.02 uA	Off	
Tow3Card12	210.00 V	6.00 uA	210.25 V	1.04 uA	On	
Tow3Card9	310.00 V	6.00 uA	310.25 V	1.48 uA	On	
Tow3Card6	160.00 V	6.00 uA	160.00 V	1.76 uA	On	

Run 306 Trigger on 4pi + CSI mult 2 coincidences - correct

Run# 306	Start : 4 pm Stop:	Date:11/ /2006
Beam: • ^{40}Ca 2.2 mg/cm^2 • ^{48}Ca • p • alpha source **E/A= 80 MeV**	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA 2(Ca E) HiRA singles 4π singles	**On shift:**
Comments: Stop because ran out of DAQ beam up		

Run# 307	Start : 5:10 Stop:	Date:11/23/2006
Beam: • ^{40}Ca 2.2 mg/cm^2 • ^{48}Ca • p • alpha source **E/A=80 MeV**	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:**
Comments:		

Run 308

Run# 308	Start : Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: 2.2mg/cm^2 ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: triggering on 4pi + mult2 coincidence lowered dE thresholds.		

Run 309 trigger on 4pi + CsI mult 2. lowered dE threshold

Run# 309	Start : Stop:	Date:11/22/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	Target: 2.2mg/cm^2 ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments:		

23

Run# 310	Start : Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	Target: 2.2 mg/cm^2 ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: trigger on 4π + CSI mult 2 coincidence lowered dE thresholds		

Run# 311	Start : Stop:	Date:11/ 23 /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic 2.2 Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: pulser ramp on EF of ~~Two~~ Tower 0 Pulser Amp 0-6V, 21 steps, 30s/step, 100Hz		

Run# 312	Start : Stop:	Date:11/ 23 /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: pulser ramp Tower 1, EF Pulser Amp 0-6 V, 21 steps, 30 s/step, 100 Hz		

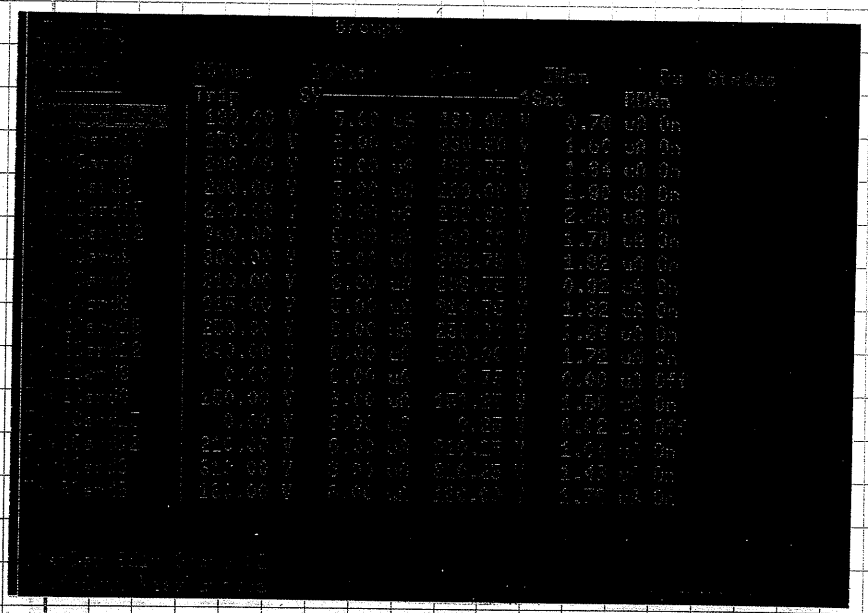
Run# 313	Start : Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: T2, EF, Pulser & Ramp Amp 0-6 V 21 steps, 30s/step. 100 Hz		

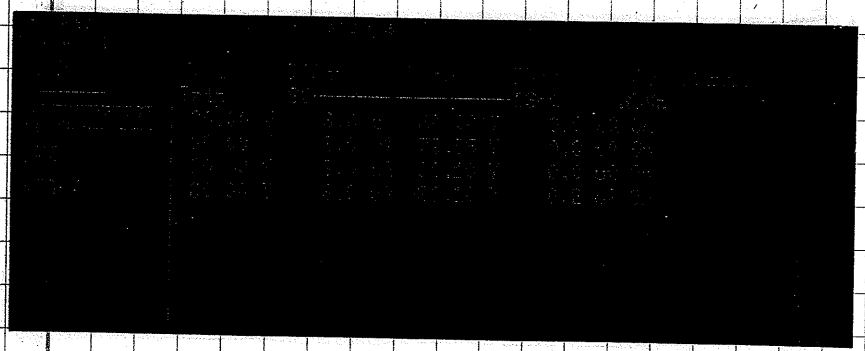
Run# 314	Start : Stop:	Date:11/ 23 /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: T2, EF Same as before		

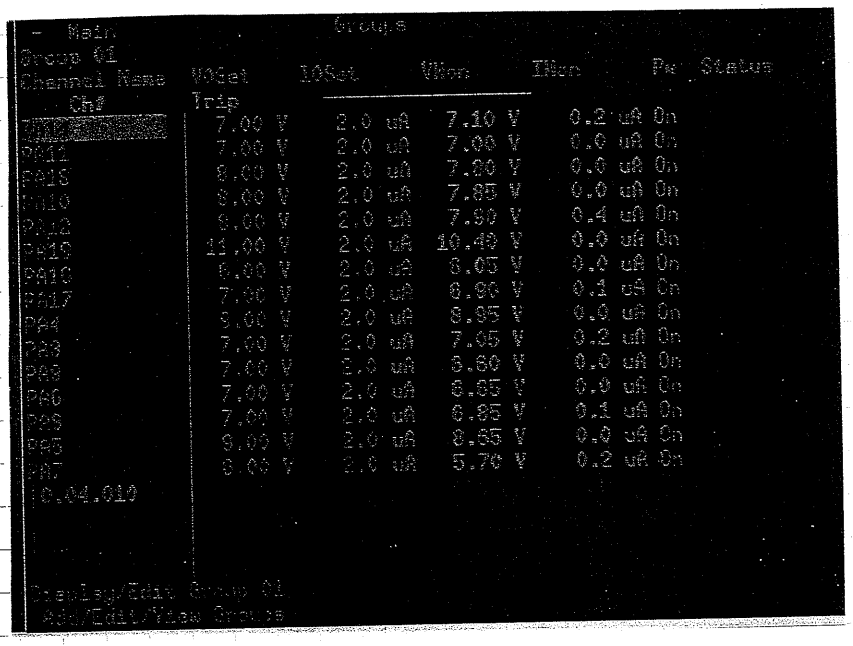
Run# 316	Start : Stop:	Date:11/ 23 /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: T3 EF Same as before		

Run# 317	Start : Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A= MeV**	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:**
Comments: T2 EF Same as before		

11:08 PM leakage currents overview.







RUN 318 → first run after Unscheduled beam Off, but threshold and gates were being set on 4π → so this run is crap

RUN 319 → good data again

Run#	Start : 23:10	Date:11/ /2006
RUN 319	Stop: 23:30	24
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:** Ulad Rida Mike Sergei

Comments:

good data

Run#	Start : 23:30 Stop: 23:55	Date:11/ /2006 24
RUN320		

Beam:	Target:	On shift:
• ^{40}Ca (circled) • ^{48}Ca • p • alpha source E/A= 80MeV	^{40}Ca (circled) mylar ^{48}Ca plastic **Trigger:** 4π + HiRA (circled) → CsI mult+2 HiRA singles 4π singles	Vlad Nicky Jenny Mike (cooking a pie) Sergei Betty

Comments:

good data

Run#	Start : 23:55 Stop:	Date:11/ /2006 24-25
RUN321		

Beam:	Target:	On shift:
• ^{40}Ca (circled) • ^{48}Ca • p • alpha source E/A= 80MeV	^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	V+N+M+J S+B

Comments:

good data → hopefully

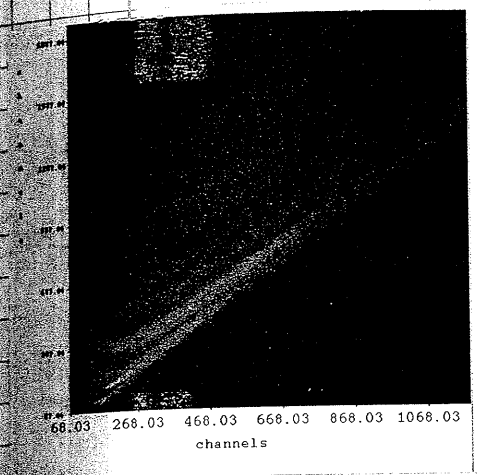
↓ WHEN run 321 ended:

↳ error message: "couldn't open socket → connection refused"

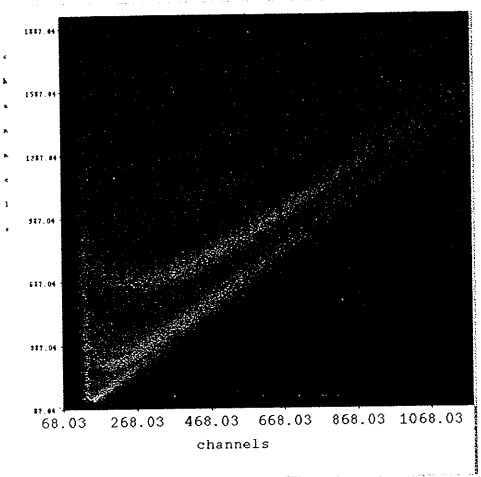
↳ run seems to be fine, just elog server crashed as well (by Vlad)

RUN 319 → nice PID's in FA

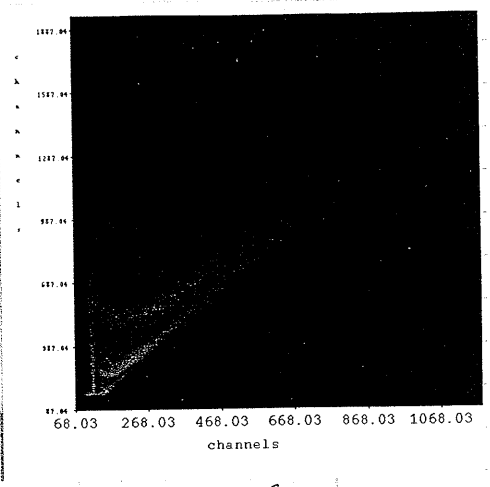
FA06



FA19



FA37



↳ watch disappearance of heavy Z's with increasing angle

1:00AM 11/25/2006 → for att. factor 10 → FA scalers ~ 600-900 counts/s
↳ 172 ~ counts/sec
↳ we will request factor 3 higher

2:10AM → beam tuning, so we entered the vault to try to fix Ball 2AdE channel + Tow2 → slot 14, 11 HiRA
↳ loose connector on cable to QDC found – 2AdE
→ terminator of Tow2 loose
↳ will it help?

2:18AM RUN 323 → good data again
↳ no improvement on 2AdE
→ no improvement on slot 14, 11 of Tow 2 either

Run# 323	**Start :** 02:18:00 **Stop:** 2:28 AM	**Date:** 11/ /2006 25
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A=** 140 **MeV**	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles CSIMult	**On shift:** Mike Vlad, Sergei Betty

Comments:
att. factor 10 → beam very tuned
↳ trigger rate OK, but only very little data taken

Run# 324	Start : 2:30 Stop: 2:39	Date:11/ /2006 25
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA CsI mult HiRA singles 4π singles	On shift: (VLAD) MIKE FILIPPOVICH Family SERGEI MICHAILOVITCH Run can't be e'logged!
Comments: data flow still somehow slow ↳ rebooting today 33 after run		

Run# 325	Start : 2:32 AM Stop:	Date:11/ /2006 25
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA CsI mult. HiRA singles 4π singles	On shift: VLAD + MIKE = THE BEST SHIFT TEAM
Comments: Changed offsets on T2, @ S11 and T2 S14 ↳ low2 Eb-slot 14,11 now work well, Eb-32 (chip2 ch15) masked off, too noisy		

Run# 326, 327	Start : Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Same as previous
Comments:		

4[30] am we found Vacuum was going down. We inspected in VC vault that forvaccum pump was switched off due to some interlock problem in AC-Socket Mike brought odd pump, we replaced it.

5[50] We were going start up again for taking beam.

Finally, vacuum inside to ball was not dropped down 10^{-2} for 1/2 hour.

We could not started due to interlock at ion beam line valve. We gave key back to operator.

6[30] no beam

6[40] L-Lum Run 329

Run# 329	Start : Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: We are: M., V., S.
Comments: something is wrong with triggering		

6 53 beam is coming back

Run# 330	Start : Stop: Junk	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: CsI mult trigger, good data → Junk & only 6 sec data.		

Run# 331	Start : Stop:	Date:11/ /2006 zp
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: CsI mult. trigger - after fast clear fix, good data * see note on PS-78		

Run# 332	Start : Stop:	Date:11/ /2006 zp
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: CsI mult trigger - after fast & clear fix, good data		

Run# 333	Start : Stop:	Date:11/ /2006 ZP
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 56 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: CsI mult trigger, after clear fast fix, good data		

Run# 334	Start : Stop: 12:07	Date:11/ /2006 ZP
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: CsI mult trigger. - new @ E-off on tow 2, slot 1 Key just taken away by operator.		

Up to run 334: does not have ~~set~~ adjusted energy offsets

Tower 2, slot 11 (tele 12, EB).

Chip board: Tower 1 slot 5

Tower 2 slot 14 behaves unstably

For sometimes, strip 0 has counts all over the range; strip 1 = completly dead

: concerning the trigger problems at 6^{31} ;

- 1/ CsI mult. 2 was plugged into coinc. directly → no overlap between CsI and 4π
- fast clear fix note:
  - 2/ it turned out that inputs A, B ~~had~~ into fast clear coinc. ~~started~~ to malfunction (~~most likely~~ were fine for all the previous runs, however !!)
    - ↳ coinc. moved to D, C inputs

Run 336

Discriminators turned off for 2 chip boards:

Tower 1, Slot 5 ; Tower 2 Slot 14

$^{40}Ca + ^{40}Ca$

RUN 337 - new run - continuation off 336
- thresholds for OE, OA Ball discriminators were not set on RUN 330-336

Run 338 - continuation of 337

11/24/06
16:40

Group 02

Channel Name	V0Set	I0Set	VMon	IMon	Pw	Status	Ch#
[illegible]	190.00 V	5.00 uA	190.00 V	0.72 uA	On		0.00.000
Tow0card12	250.00 V	5.00 uA	250.50 V	1.60 uA	On		0.00.001
Tow0Card9	200.00 V	5.00 uA	195.75 V	1.64 uA	On		0.00.002
Tow0Card6	200.00 V	5.00 uA	200.00 V	1.90 uA	On		0.00.003
Tow1Card15	240.00 V	6.00 uA	239.50 V	2.40 uA	On		0.00.005
Tow1Card12	340.00 V	6.00 uA	340.00 V	1.80 uA	On		0.00.006
Tow1Card9	360.00 V	5.00 uA	353.75 V	1.86 uA	On		0.00.007
Tow1Card6	210.00 V	6.00 uA	209.75 V	0.34 uA	On		0.00.008
Tow1Card3	315.00 V	5.00 uA	314.75 V	1.34 uA	On		[illegible]
Tow2Card15	250.00 V	6.00 uA	250.00 V	1.34 uA	On		0.00.010
Tow2Card12	340.00 V	6.00 uA	340.25 V	1.74 uA	On		0.00.011
Tow2Card9	0.00 V	6.00 uA	0.75 V	0.00 uA	Off		0.00.012
Tow2Card6	150.00 V	6.00 uA	150.25 V	1.58 uA	On		0.00.013
Tow3Card15	0.00 V	6.00 uA	0.25 V	0.02 uA	Off		0.00.015
Tow3Card12	210.00 V	6.00 uA	210.25 V	1.04 uA	On		0.00.016
Tow3Card9	310.00 V	6.00 uA	310.25 V	1.48 uA	On		0.00.017
Tow3Card6	180.00 V	[illegible]	180.00 V	1.72 uA	On		[illegible]

Group 01

Channel Name	V0Set	I0Set	VMon	IMon	Pw	Status	Ch#
PA12	[illegible] V	2.0 uA	7.10 V	0.2 uA	On		0.03.000
PA11	7.00 V	2.0 uA	7.00 V	0.0 uA	On		0.03.001
PA13	8.00 V	2.0 uA	7.80 V	0.0 uA	On		0.03.002
PA10	8.00 V	2.0 uA	7.85 V	0.0 uA	On		0.03.003
PA12	8.00 V	2.0 uA	7.90 V	0.3 uA	On		0.03.004
PA1[illegible]	11.00 V	2.0 uA	10.40 V	0.0 uA	On		0.03.007
PA16	6.00 V	2.0 uA	6.05 V	0.0 uA	On		0.03.010
PA17	7.00 V	2.0 uA	6.90 V	0.1 uA	On		0.04.000
PA4	9.00 V	2.0 uA	8.95 V	0.0 uA	On		0.04.002
PA3	7.00 V	2.0 uA	7.05 V	0.2 uA	On		0.04.006
PA9	7.00 V	2.0 uA	6.60 V	0.0 uA	On		0.04.007
PA8	7.00 V	2.0 uA	6.65 V	0.0 uA	On		0.04.008
PA6	7.00 V	2.0 uA	6.65 V	0.1 uA	On		0.04.009
PA5	9.00 V	2.0 uA	8.65 V	0.0 uA	On		0.04.010
PA7	6.00 V	2.0 uA	5.70 V	0.3 uA	On		

LocEn V0 I0 | CAEN SY2527

Display/Edit Group 01

Group [illegible]

Channel Name	V0Set	I0Set	VMon	IMon	Pw	Status	Ch#
C?12	[illegible] V	3.0 uA	80.00 V	0.0 uA	On		0.03.005
C?11	80.00 V	3.0 uA	79.65 V	0.2 uA	On		0.03.011
C?10	80.00 V	3.0 uA	80.1? V	0.0 uA	On		0.04.005
[illegible]	80.00 V	3.0 uA	80.10 V	0.2 uA	On		0.04.011

Run# 335	Start : 11/24/06 12:14:53 Stop: 12:15:45	Date:11/24/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80MeV	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:**
Comments: ended incorrectly due to elog being killed. Ele good, though. Thresholds for odd E, oddA Ball disc. not set		

Run# 336	Start : 12:16:43 Stop: 12:46:46	Date:11/24/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80MeV	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:**
Comments: Disc. Turned off for 2 chipboards: T155, T2514 Thresholds for odd E, oddA Ball disc not set		

Run# 337	Start : 12:48:17 Stop: 13:38:46	Date:11/24/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:**
Comments: Mica run - Continuation of 336		

Run# 338	Start : Stop:	Date:11/24/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:** Dan C, Betty, Bill, Daniela, Andy
Comments: Data run, Continuation of 337		

Run# 339	Start : Stop:	Date:11/24/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:** Betty, Bill, Dan C, Daniela, Andy
Comments: Data run, Continuation of 337		

Run# 340	Start : 15:30:12 Stop:	Date:11/24/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:** Betty, Bill Dan, Daniela, Andy Micha
Comments: Data Run, Continuation of 337 "40Ca+40Ca, CsI mult trigger and 4Pi"		

Run# 341	Start : ~~13:30:12~~ 16:35:13 Stop:	Date:11/24/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Betty, Daniela, Andy, Micha, Dan C Mark
Comments: Data Run, Continuation of 337, run ended - trigger died use same title		

Run# 342	Start : 17:09:54 Stop:	Date:11/24/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Betty, Daniela, Mark, Andy, Micha, Dan C
Comments: data Run. Continuation of 237-241, Previous run terminated unexpectedly.		

Run 343: Switching to multiplicity 1 CsI trigger

Run# 343	Start : 17:32:16 Stop: dun, 2048	Date:11/24/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill Betty Andy Mark, Mike Daniela, Dan C Sun
Comments: Switching to multiplicity 1 CsI trigger "40Ca+40Ca, CsI mult (mult one) trigger and 4pi		

5:45pm Readout not writing to elog - run info won't update

6:10 pm Going in to vault to visually inspect Ca target for oxidation

19:00 Mylar Target in

Run 344 – Mylar, mult 1 CsI +4PI

Ca^{40} target looks good - in fact, better than before
looks lighter than before
Oxygen knocked off? If so, previous data could be Oxygen contaminated, but following data will be good!

All mult runs today have been mult2 on 4Pi

20:00 Ca40 target back in

chips being moved, good chips attached to bad telescopes being moved to replace bad chips attached to good telescopes.

elog still not working properly

Run# 344	Start : Stop:	Date: 11/4/2006
Beam: • (40Ca) • 48Ca • p • alpha source E/A= 80MeV	Target: 40Ca (mylar) 48Ca plastic Trigger: (4π + HiRA) HiRA singles 4π singles	On shift:
Comments: Mylar, same trigger as 343 stopped early due to data analysis problems		

Run# 345	Start : Stop:	Date:11/4/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: mult 2 CsI + 4pi trigger		

Run# 346	Start : Stop:	Date:11/4/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: Ball trigger, mult 2 Beam stop in for part of run		

Run# 347	Start : Stop: 19:48:00	Date:11/4/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: redoing 346 w/ no beam stop		

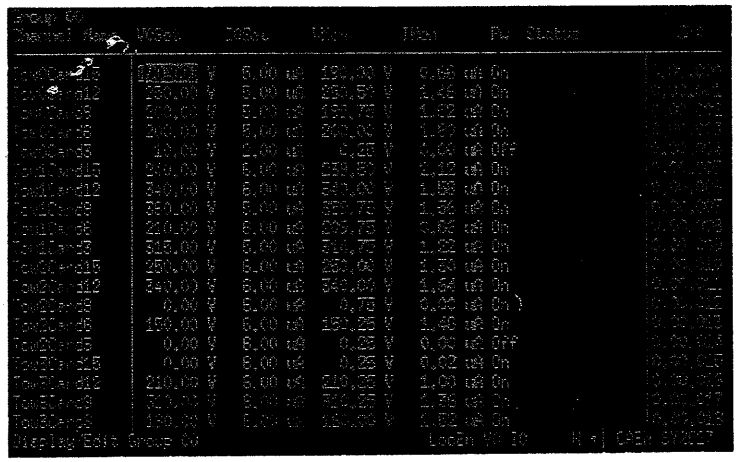
Run# 348	Start : Stop:	Date:11/4/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: Good data after chipboards switched CsI mult 2 trigger		

changed attenuators

Note: changed attenuation factor partway through Run 348, from 10 to 3. Also, forgot to change trigger. was only triggering on 4pi

Only Eback changed, Efront chipboards not moved

Ef:



Instructions: (Zoom-in procedure)

1) unfold the folded paper toward your left (←)

2) unfold the second half of the paper toward your right side (→)

3) when done, fold everything back together.

Note: for past 2 runs, forgot to change trigger, was actually triggering on 4pi, not CsI

NO, Everything was fine, trigger was on CsI.

Run# 349	Start : Stop:	Date: 11/24/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA, HiRA singles, 4π singles	On shift: Bill, Betty, Vlad, Micha, Michael, Mar, Sergei
Comments: CsI Mult 2 + 4π		

we had some difficulty reading back coulotten be a heads that is not understood e Spectra?

Run# 350	Start : Stop:	Date: 11/24/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA, HiRA singles, 4π singles	On shift: Bill, Betty, Vlad, Micha, Mike, Mark, Alisher, Sergei
Comments: CsI Mult 2 + 4π		

Run# 351	Start : Stop:	Date: 11/24/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA, HiRA singles, 4π singles	On shift: 11
Comments: CsI Mult 24 4π		

Runs 352-354 are the same
12:38 Attn factor 1 Beam intensity
increased. Before run355.

Run 355. Event rate FA first ring
on the order of 5kHz, which
is factor of 3 in
but live tr. rat 280 which
is only 25-30% increas

Run# 355	Start : Stop:	Date: 11/29/2006
Beam: • ~~^{40}Ca~~ • ^{48}Ca • p • alpha source E/A= MeV	Target: ~~^{40}Ca~~ mylar ^{48}Ca plastic Trigger: ~~4π + HiRA~~ ~~HiRA singles~~ 4π singles	On shift: Betty, Vlad, Micha, Michael Mark, Alisher Sergei
Comments: See above		

12:03 1.5E-05 torr - Pressure

Run# 356	Start : 0:55:00 Stop: 0:11	Date: 11/29/2006
Beam: • ~~^{40}Ca~~ • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ~~^{40}Ca~~ mylar ^{48}Ca plastic Trigger: ~~4π + HiRA~~ ~~HiRA singles~~ 4π singles	On shift: Betty Vlad Mike, Mark, Alisher, Sergei
Comments:		

Run# 357	Start : 01:11 Stop: 01:57	Date:11/5/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Mike Vlad Sergei
Comments: CsI mult 2 trigger		

Run# 358	Start : 01:57 Stop: 03:01	Date:11/5/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA CsI Mult HiRA singles 4π singles	On shift: Mike Vlad Sergei
Comments: CsI mult2 trigger		

Run# 359	Start : 03:01 Stop: 3:28	Date:11/5/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles CsI Mult 4π singles	On shift: Mike Vlad Sergei
Comments: CsI mult 2 trigger		

D'50

- Main Utility Groups View User

Group 02

Channel Name	VOSet	IOSet	VMon	IMon	Pw	Status	Ch#
Tow0Card15	190.00 V	5.00 uA	190.00 V	0.70 uA	On		0,00,000
Tow0Card12	250.00 V	5.00 uA	250.50 V	1.54 uA	On		0,00,002
Tow0Card9	200.00 V	5.00 uA	199.75 V	1.64 uA	On		0,00,002
Tow0Card6	200.00 V	5.00 uA	200.00 V	1.80 uA	On		0,00,003
Tow1Card15	240.00 V	6.00 uA	239.50 V	2.54 uA	On		0,00,005
Tow1Card12	340.00 V	6.00 uA	340.00 V	1.74 uA	On		0,00,006
Tow1Card9	360.00 V	6.00 uA	359.75 V	1.82 uA	On		0,00,007
Tow1Card6	210.00 V	6.00 uA	209.75 V	0.90 uA	On		0,00,008
Tow1Card3	315.00 V	5.00 uA	314.75 V	1.32 uA	On		0,00,009
Tow2Card15	250.00 V	6.00 uA	250.00 V	1.32 uA	On		0,00,010
Tow2Card12	340.00 V	6.00 uA	340.00 V	1.62 uA	On		0,00,012
Tow2Card9	0.00 V	6.00 uA	0.75 V	0.00 uA	On		0,00,012
Tow2Card6	150.00 V	6.00 uA	150.25 V	1.54 uA	On		0,00,013
Tow3Card15	0.00 V	5.00 uA	0.25 V	0.02 uA	On		0,00,105
Tow3Card12	210.00 V	6.00 uA	210.25 V	1.04 uA	On		0,00,015
Tow3Card9	310.00 V	6.00 uA	310.25 V	1.46 uA	On		0,00,017
Tow3Card6	180.00 V	6.00 uA	180.00 V	1.72 uA	On		0,00,018

General System Configuration — LocEn VO IO — N-4 — CAEN SY2527

Run# 360	**Start :** 3:49 **Stop:** 4:43	**Date:11/ /2006** ~~26~~ 25
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A=**40 **MeV**	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA CsI HiRA singles 4π singles	**On shift:** Vlad Sergei
Comments: CsI mult 2 Trigger		

Run# 361	**Start :** 4:43 **Stop:** 5:28	**Date:11/ /2006** ~~26~~ 25
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A=**40 **MeV**	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA + CsI mult 2 HiRA singles 4π singles	**On shift:** Vlad Sergei
Comments: CsI mult 2 Trigger.		

Run# 362	Start : 5:29 Stop: 6:11	Date:11/ /2006 26 25
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA +CsI multi HiRA singles 2 4π singles	On shift: Vlad Sergei
Comments: during the run nothing interesting happened		

Run# 363	Start : 6:12 Stop:	Date:11/ /2006 26
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA CsI + multi 1 HiRA singles = 4π singles	On shift: Sergei Daniela
Comments: this is a special 1 hour run with CsI multiplicity (1) !!!		

Run# 364	Start : 07:12 Stop: 7:55	Date:11/ /2006 26
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA ~~HiRA singles~~ 4π singles	On shift: Daniela Sergei Alisher
Comments: Multiplicity 2 now		

Run# 365	Start : 7:55 Stop:	Date:11/ 25 /2006
Beam: • (circled) ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: (circled) ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Daniele Fleiker
Comments: continuation of 364		

Run# 366	Start : 9:15 Stop:	Date:11/ ~~26~~ 25 /2006
Beam: • (circled) ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: (circled) ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Andy, Mike Daniele, Bill Betty, Jenny
Comments: CsI multiplicity two trigger.		

Run 366: Pulser every one in tenth (second) → To check the gain does not change 10 Volt, but divided by 8 times

↳ pulser amplitude into HiRA after splitting too low, most of the channels below thresholds - see RUN 367

Run# 367	Start : Stop:	Date:11/ /2006 25
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= ∫ MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: CsI mult 2 trigger + pulser check		

Run# 368	Start : Stop:	Date:11/ /2006 25
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: CsI mult 2 Trigger + Pulser		

Run# 369	Start : 10:29 Stop:	Date:11/ /2006 25
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: Same as 368 + Pulser		

Remove Pulser from even channels on both EF, EB, dE.

Run# 370	Start : 11:23 Stop:	Date:11/ /2006 25
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: Pulser removed from even channels on EF, EB & dE.		

Run# 371	Start : Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: Same as 370		

Run# 372	Start : Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: WLynd TSANG Lee, Roger Wallace
Comments: raised thresholds by 2 channels on all ~~HiRA~~ 4π PADS event length decreased by about 150-200 words. DT decreased from 1.3ms to 1ms. But data rate appears to be about the same?		

Copied

Hung up in the middle of the run

94

Stopped 372. But it would not end properly. Therefore we killed scaler and readout programs

Run# 373	Start : Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Betty, Andy, Alisher Sun
Comments: Continuation of 372		

Run# 374	Start : Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Betty, Andy, Alisher Sun
Comments: Continuation of 373		

Run# 375	Start : Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Betty, Andy, Alisher, Sun
Comments: Attn set to 3 (from)		

14:05

- Main Utility Setup Groups View User

Group 02

Channel Name	VOSet	IOSet	Vmon	Imon	Pw	Status	Ch#
Tow0Card15	[illegible] V	5.00 uA	150.00 V	0.70 uA	On		0.00.000
Tow0card12	250.00 V	5.00 uA	254.50 V	1.60 uA	On		0.00.001
Tow0Card9	200.00 V	5.00 uA	193.75 V	1.64 uA	On		0.00.002
Tow0Card6	200.00 V	5.00 uA	200.00 V	1.92 uA	On		0.00.003
Tow1Card15	240.00 V	5.00 uA	233.50 V	2.44 uA	On		0.00.004
Tow1Card12	340.00 V	5.00 uA	340.00 V	1.80 uA	On		0.00.005
Tow1Card9	360.00 V	5.00 uA	353.75 V	1.90 uA	On		0.00.006
Tow1Card6	210.00 V	5.00 uA	203.75 V	0.82 uA	On		0.00.007
Tow1Card3	315.00 V	5.00 uA	314.75 V	1.32 uA	On		0.00.008
Tow2Card15	250.00 V	5.00 uA	250.00 V	1.36 uA	On		0.00.009
Tow2Card12	340.00 V	5.00 uA	340.25 V	1.70 uA	On		0.00.010
Tow2Card9	0.00 V	5.00 uA	1.00 V	0.00 uA	On		0.00.011
Tow2Card6	150.00 V	5.00 uA	150.25 V	1.50 uA	On		0.00.012
Tow3Card15	0.00 V	5.00 uA	0.25 V	0.02 uA	On		0.00.013
Tow3Card12	210.00 V	5.00 uA	210.25 V	1.06 uA	On		0.00.014
Tow3Card9	310.00 V	5.00 uA	310.25 V	1.48 uA	On		0.00.015
Tow3Card6	160.00 V	5.00 uA	160.00 V	1.70 uA	On		0.00.016

Display/Edit Group 02 LocEn VM IO N + CAEN SY2527

Run# 376	**Start :** **Stop:**	**Date:11/ /2006**
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A=** MeV	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:** Bill, Betty, Alisher, Mark Andy
Comments: Same as 375		

Run# 377	**Start :** **Stop:**	**Date:11/ /2006**
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A=** MeV	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:** Bill, Betty Alisher, Mark, Andy Vlad.
Comments:		

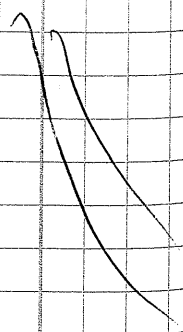
E thresholds on ball & FA are set too low.

Run# 378	Start : Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=90MeV	Target: ^{40}Ca mylar ^{48}Ca plastic	On shift: Bill Betty, Mark, Andy, Sergei, Alisher Micha
	Trigger: ~~4π + HiRA~~ ~~HiRA singles~~ 4π singles	
Comments: Attn set to 1. live trigger 480.	Event rate on FA 6-7kHz	

Run# 379	Start : Stop: 18:15	Date:11/1/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=90MeV	Target: ^{40}Ca mylar ^{48}Ca plastic	On shift: Bill, Betty, Mark, Andy, Sergei, Alisher Micha
	Trigger: ~~4π + HiRA~~ HiRA singles 4π singles	
Comments: Run with higher intensity, maybe a little too high.		

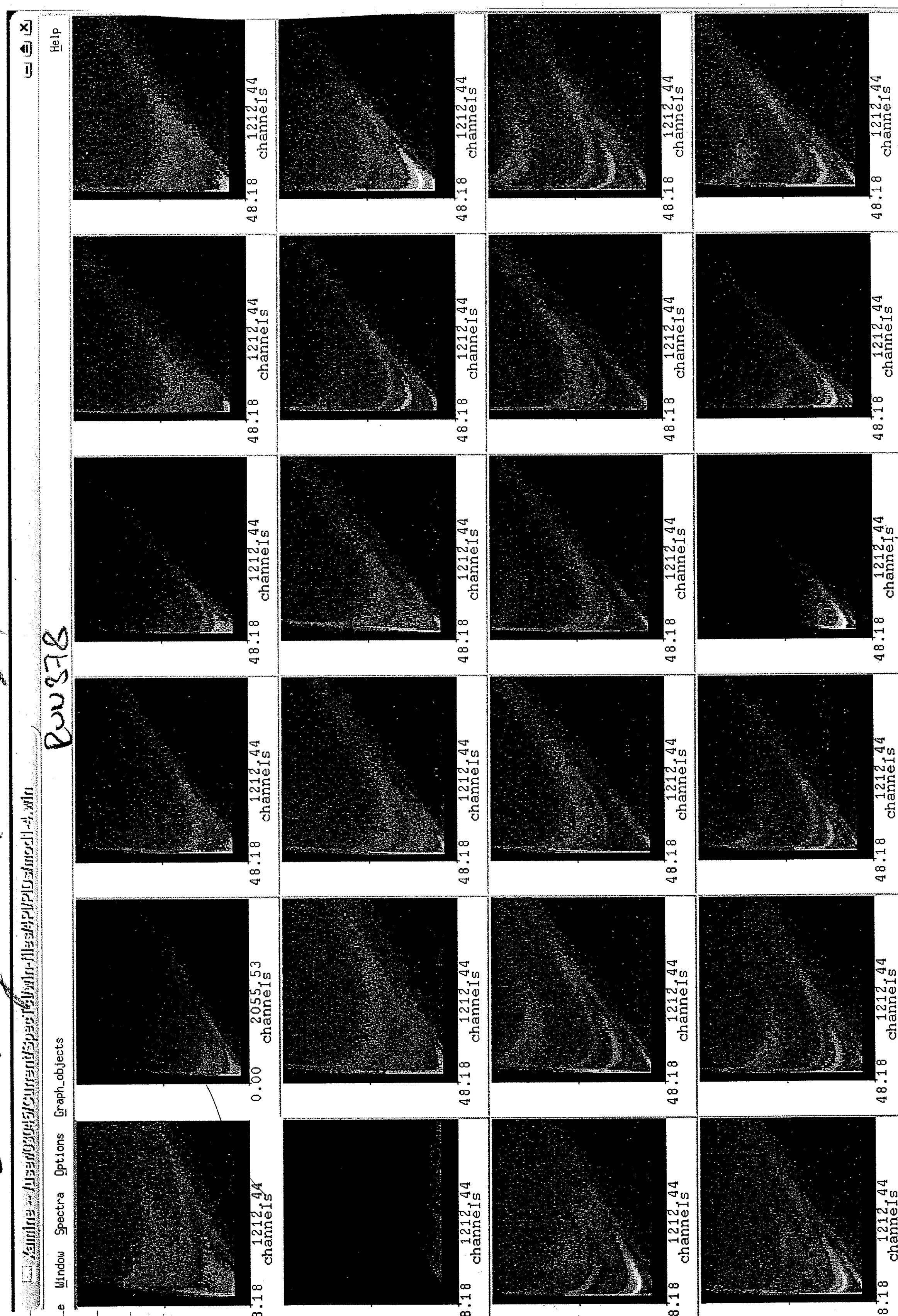
Note: The operators adjusted slits on ion source.

Run# 380	Start : 16:30 Stop: 17:43	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic	On shift: Bill, Betty Mark, Andy Sergei, Alisher Micha.
	Trigger: 4π + HiRA HiRA singles 4π singles	
Comments: Trying to modify dead time. (Increase readout. To decrease trigger rate)		



Intensity too high

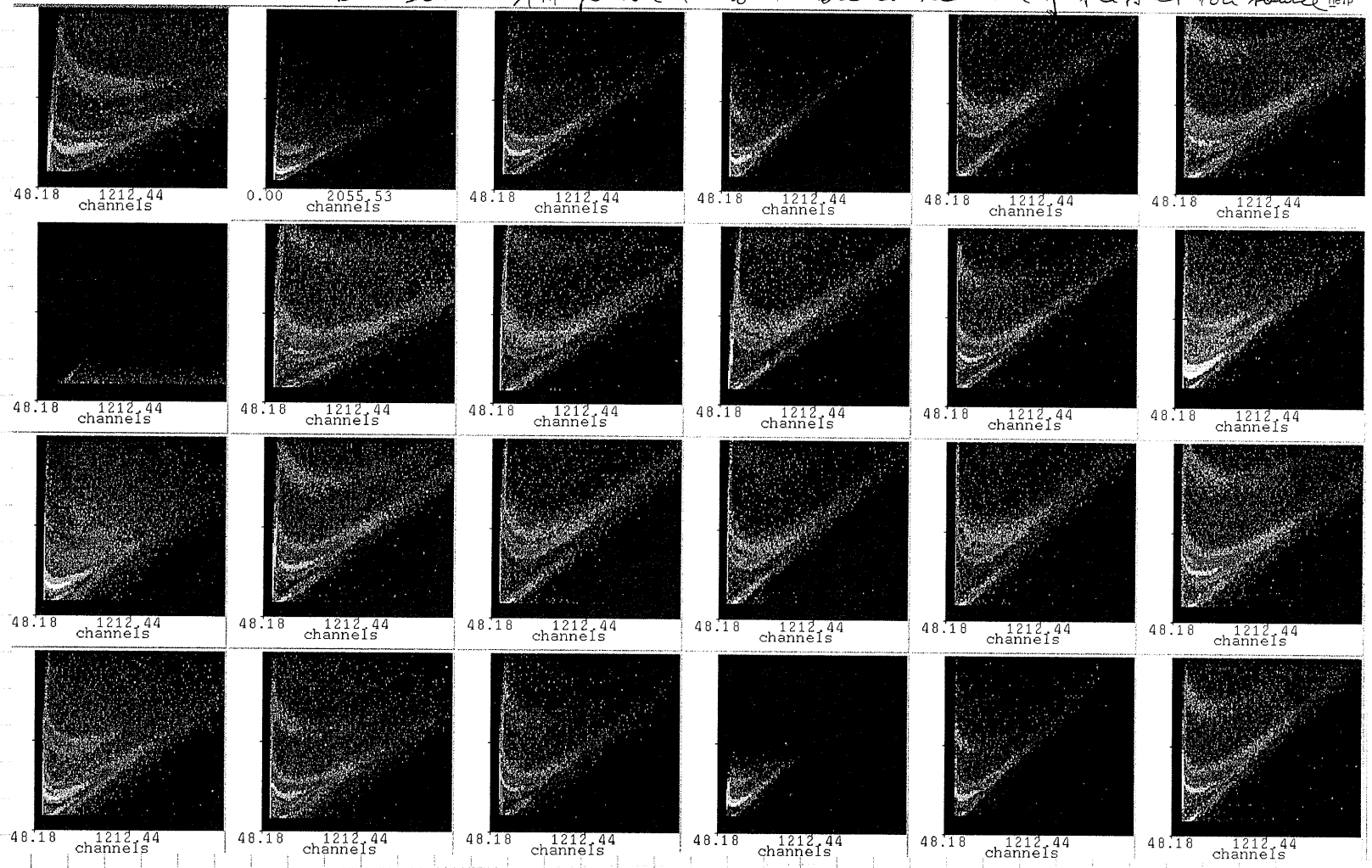
Run 378



⟹ Lowered the thresh on 16th cha
(#15) to 0 forcing polling to
stop at minimum time.

16:40, Comparing two intensities.

File Window Spectra Options Graph_objects RUN 380 → ### factor 1 but beam reduced by ### at ion source Help

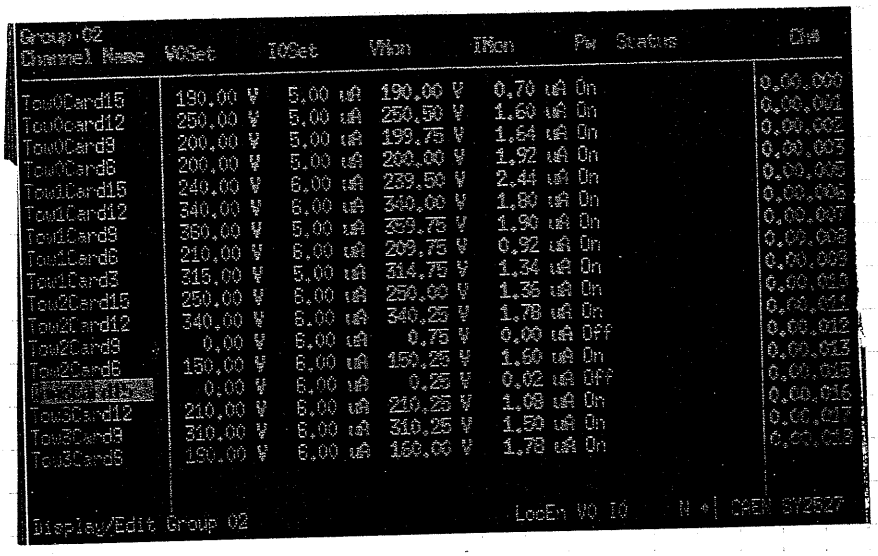


Run# 381	Start : 18:44 Stop:	Date:11/2/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Betty, Alisher, Mark, Andy, Micha Vlad
Comments: Same as 380.		

Run# 382	Start : 9:10 Stop:	Date:11/3/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA + CsI mult 2 HiRA singles 4π singles	On shift: Vlad Ali Micha
Comments: Thresholds on FA 30, changed from 7→12 Ball dE 27E changed from 34-255		

Run# 383	Start : 20:31 Stop: 20:34	Date:11/3/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill Micha, Vlad, Don
Comments: Readout Crashed after short time - restarted and Ova work after being in vault. Short but OK		

11/25/06
19:50



Run# 384	**Start :** 20:40 **Stop:** 22:04	**Date:** 11/27/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A=** 80 **MeV**	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:** Bill Micha, Vlad, Don
Comments: CsI mult 2 trig, 4pi E thresholds increased by 1 chan's Long run		

Note: added Big Brother & Big Brother live on misc scalers, starting with 384. Ch 6, 7 (starting from zero)

Run# 385	**Start :** 22:04 **Stop:** 23:10	**Date:** 11/27/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A=** **MeV**	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:** Vlad, Micha, Don
Comments: Data run, continuation of 384		

22:30 Looking at dead DE channels over time

Run	start time	dead DE channels
288	7:40 11/23/06	tele 0.25 2.11 p
		3.11p 3.16
		5.4 5.12
		6.4 6.12 6.25
		7.4 7.6 7.12 7.30
		10.0 10.13 10.29
		12.0 12.4 12.12
		16.11 16.29p
		19.4 19.12 19.17

telescopes 4, 9, 17 skipped (no data)

336	12:16 11/24/06	0.25
		2.11p
		3.11p 3.16
		5.4 5.12
		6.4 6.12 6.25
		7.4 7.6 7.12 7.30
		10.0 10.13 10.29
		12.0 12.4 12.12
		16.11 16.29p
		19.4 19.12 19.17p

		problems	dead
382	19:09 11/25/06	0.25	
		2.11	
		3.11	3.16
			5.4 5.12
			6.4 6.12 6.25
		7.22	7.4 7.6 7.12 7.30
		10.24	10.0 10.13
			12.0 12.4 12.12
			16.11 16.29
			19.4 19.12 19.17

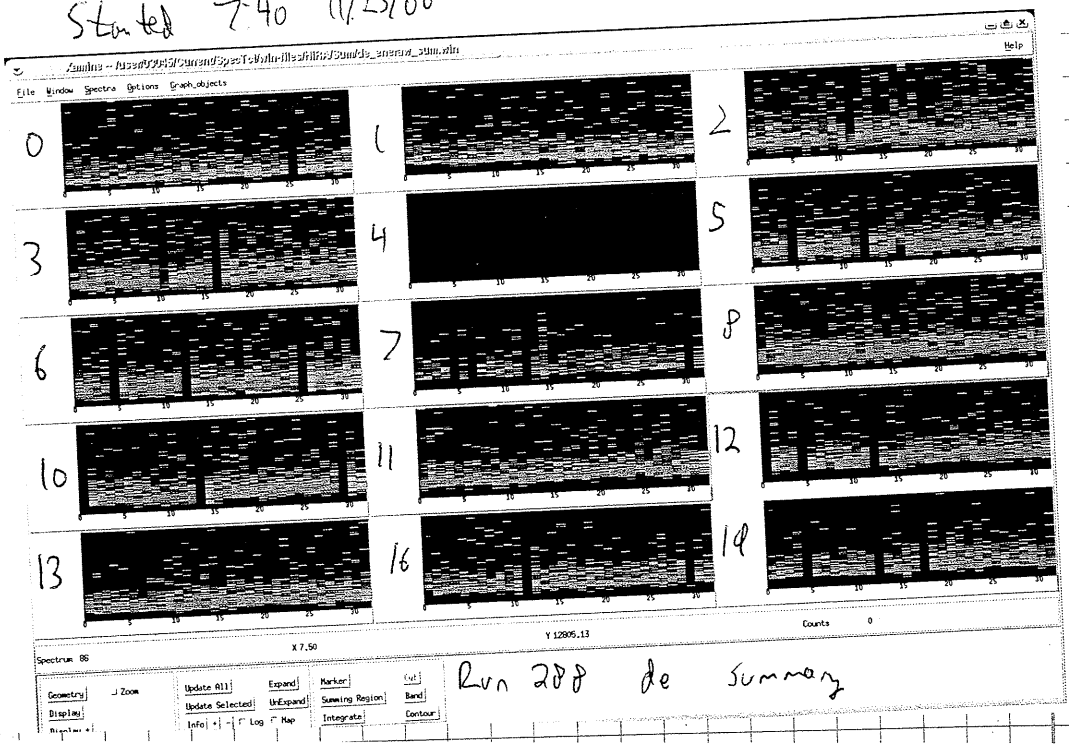
p = problems = one or two lines on otherwise blank chan

See p 104 for special summary printouts

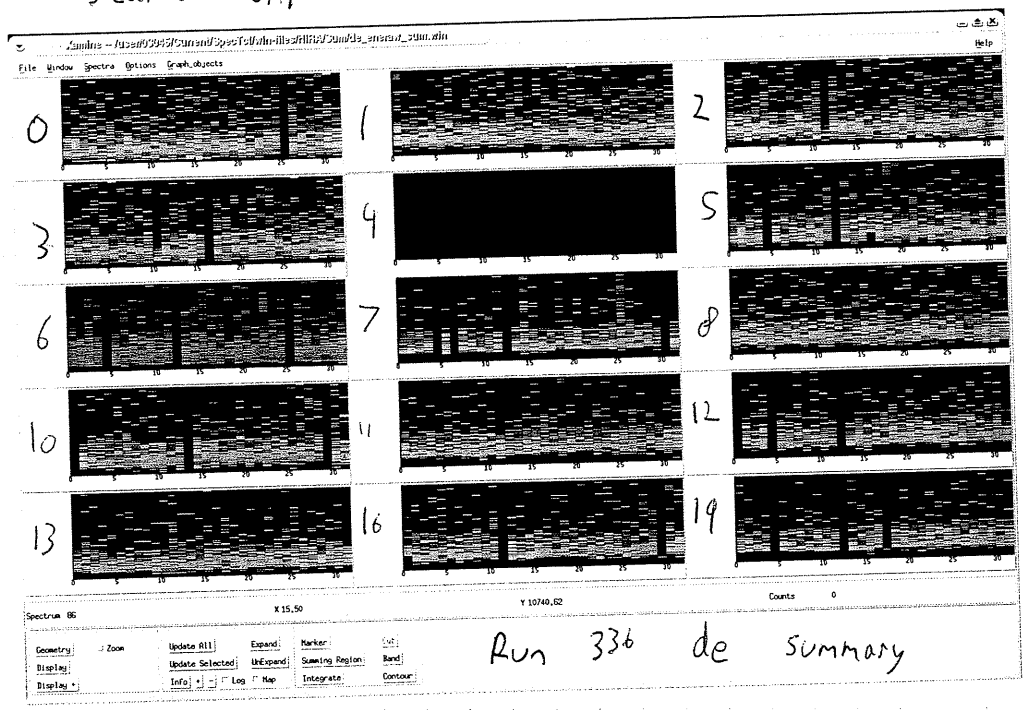
Run# 386	Start : 23:10 Stop: 00:02	Date:11/25/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Vlad Micha, Sergei Dan
Comments: Data run. Continuation of 385		

Run# 387	Start : 00:02 Stop:	Date:11/26/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Micha Vlad, Sergei, Dan
Comments: Continuation of 384-6		

Started 7:40 11/23/06

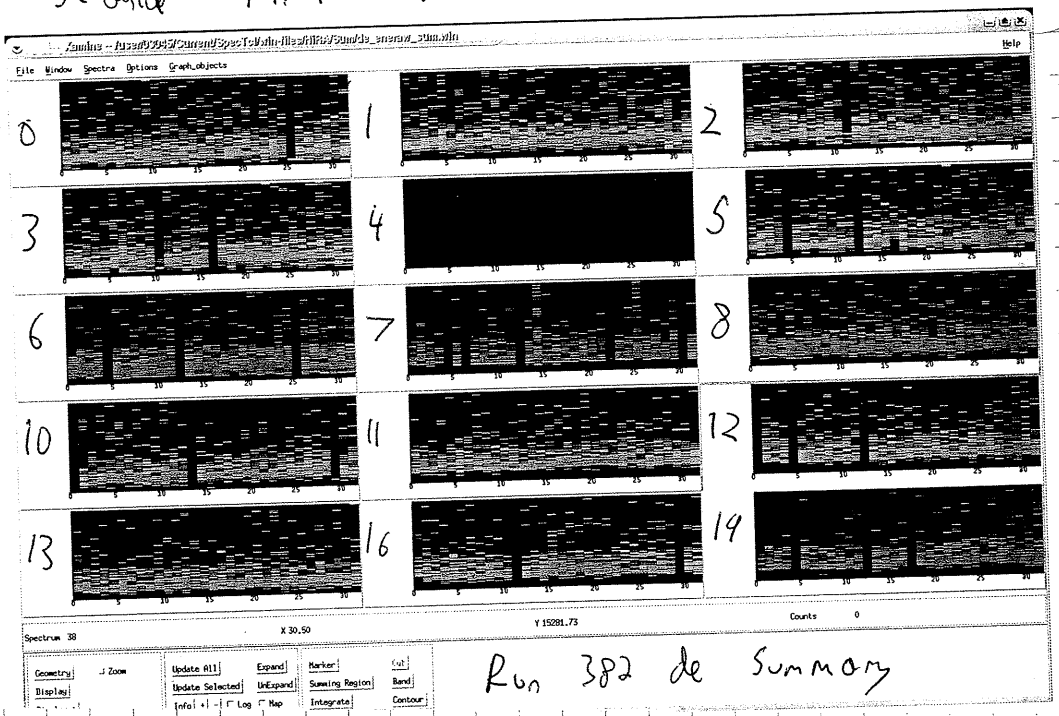


started 12:16 11/24/06



Run 336 de summary

started 19:09 11/25/06



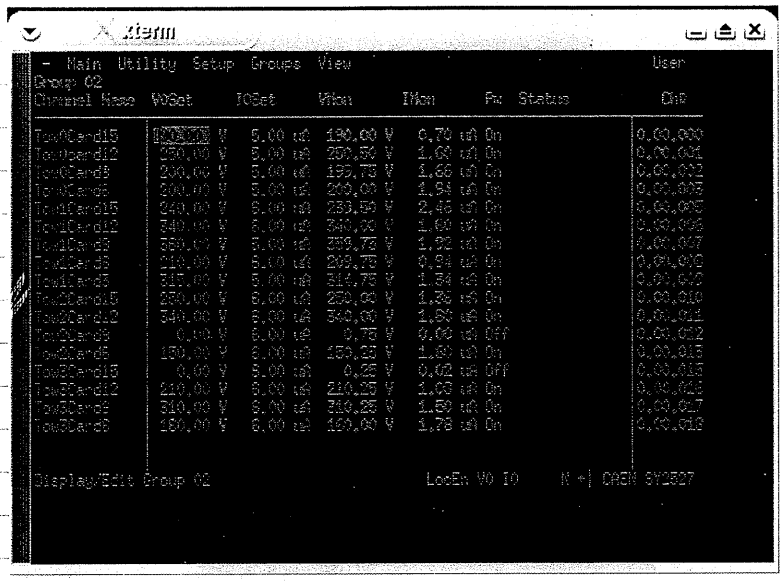
Run 382 de Summary

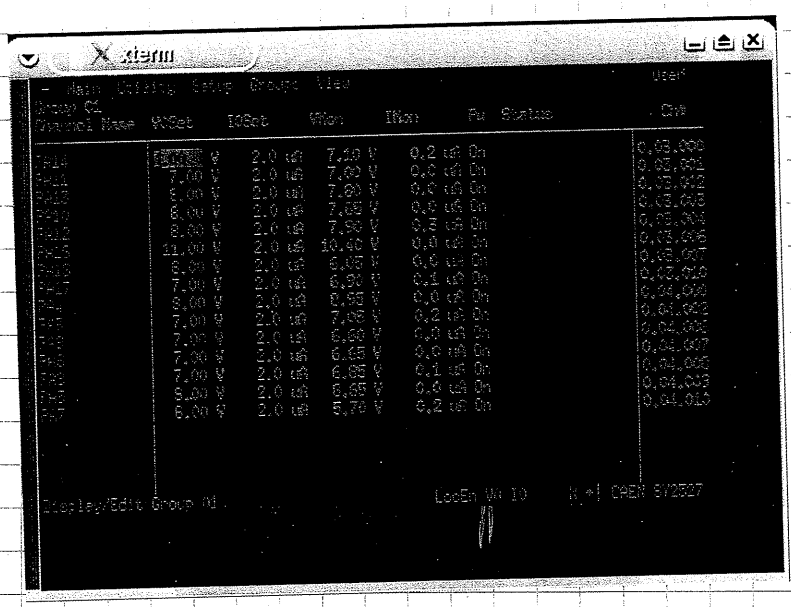
Run# 388	Start : 2:12 Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: D. H. S. L.
Comments: Same conds as before Mult 2		

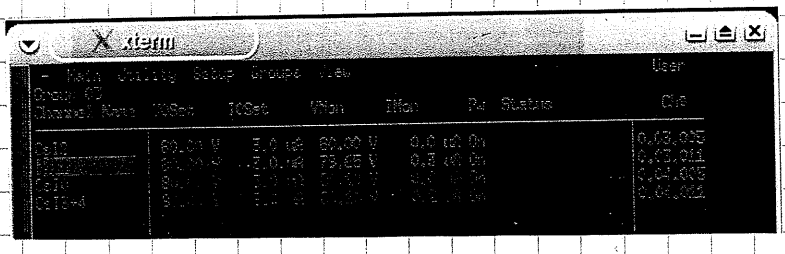
Run# 389	Start : 2:11 Stop: 3:15	Date:11/1/2006 26
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA (CSI, mult 2) HiRA singles 4π singles	On shift: Sergei Daniele
Comments: continuation of 388		

Run# 390	Start : 3:15 Stop:	Date:11/1/2006 26
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA CSI mult 2 HiRA singles 4π singles	On shift: Sergei Daniele
Comments: Same as before		

26/11/06 3:45


xterm
- Main Utility Setup Groups View
Group 02
Channel Name VMSet IOSet VMon IMon Pw Status Cnt
Display/Edit Group 02
LocEn VM IO
OPEN SY2527


xterm
- Main Utility Setup Groups View
User
Group 01
Channel Name VMSet IOSet VMon IMon Pw Status Cnt
Display/Edit Group 01
LocEn VM IO
OPEN SY2527


xterm
- Main Utility Setup Groups View
User
Group 07
Channel Name VMSet IOSet VMon IMon Pw Status Cnt

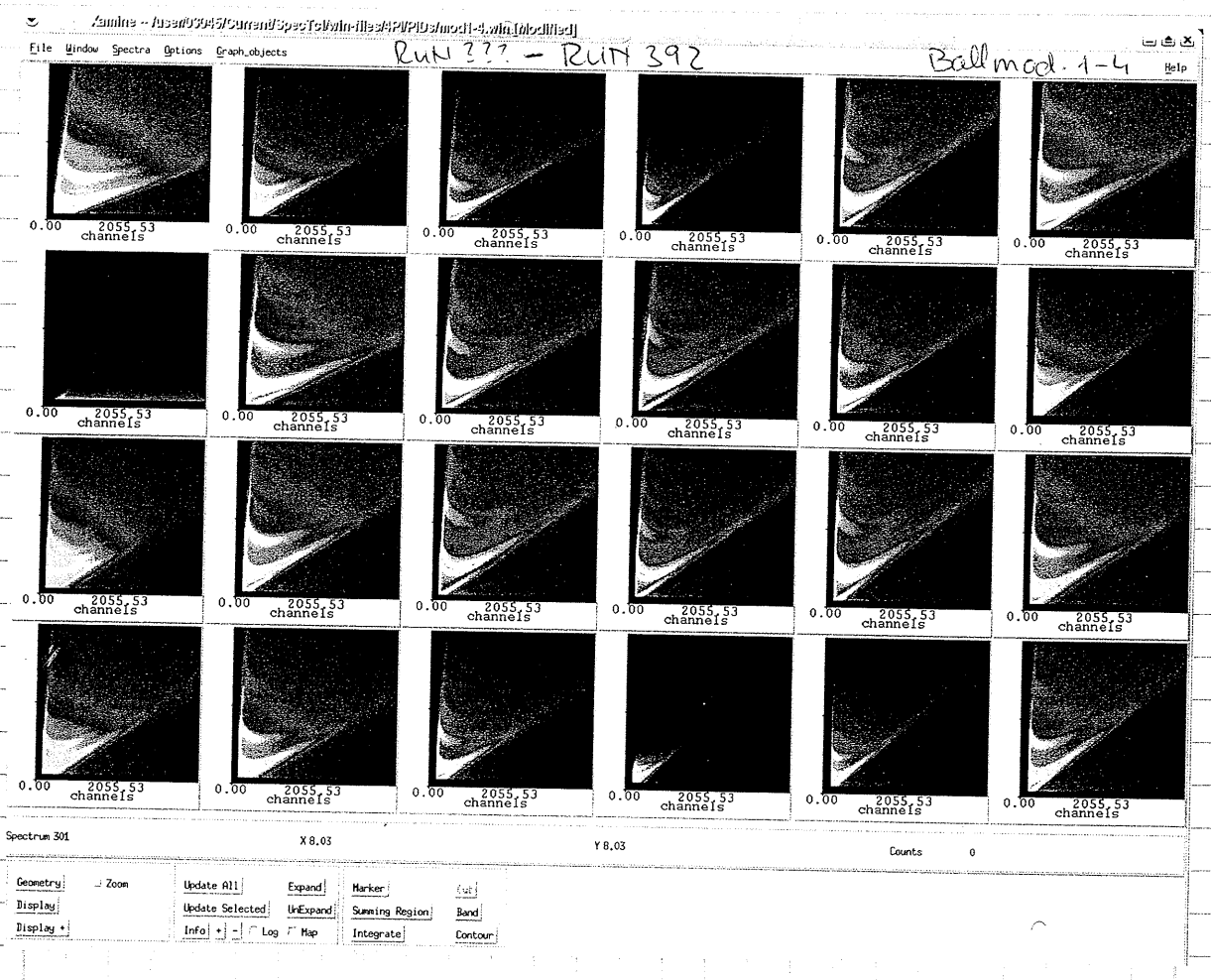
Run# 391	Start : 4:26 Stop: 4:55	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: P.H. S.L.
Comments: Same as previous TRIG. Mult. = 2		

4:55 operators take beam to stabilize

Run# 392	Start : 5:04 Stop: 5:20	Date:11/26/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA CSI mult 2+ht HiRA singles 4π singles	On shift: Daniele Sergei
Comments: continuation of data taking after beam tune → stopped due to readout wash		

Run# 393	Start : 5:21 Stop:	Date:11/26/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA CSI mult 2+ht HiRA singles 4π singles	On shift: Sergei Daniele
Comments: continuation of data taking		

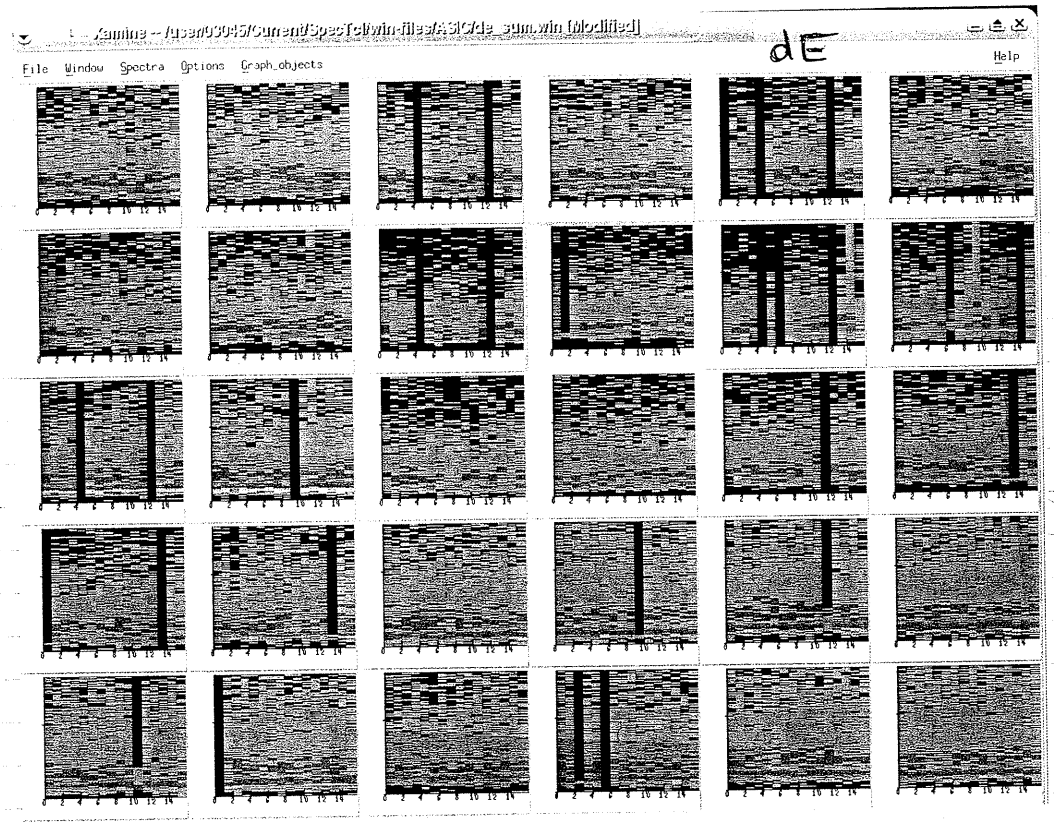
5:26



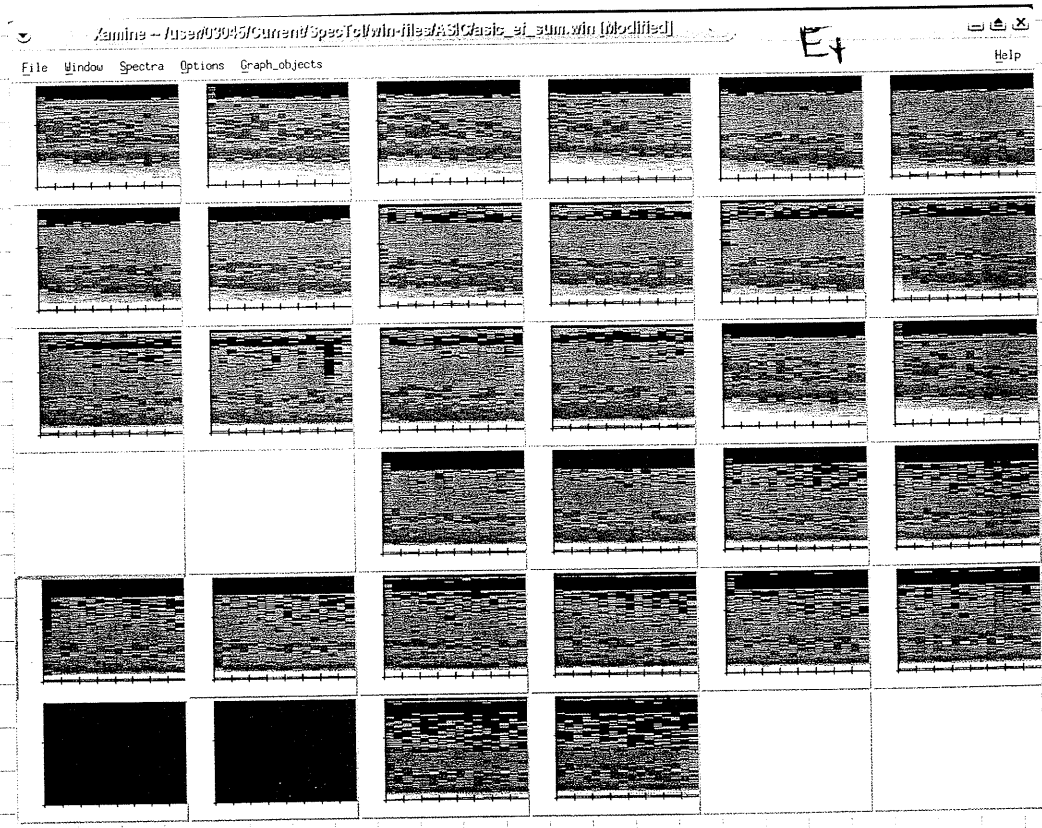
Run# 394	**Start :** 6:26 **Stop:** 7:20	**Date:** 11/1/2006 26
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A=** 80 **MeV**	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA (CSI result 2+4) HiRA singles 4π singles	**On shift:** Sergei Daniela
Comments: Continuation of data taking		

11/2.6/06 7:30

RUN 390 - 394

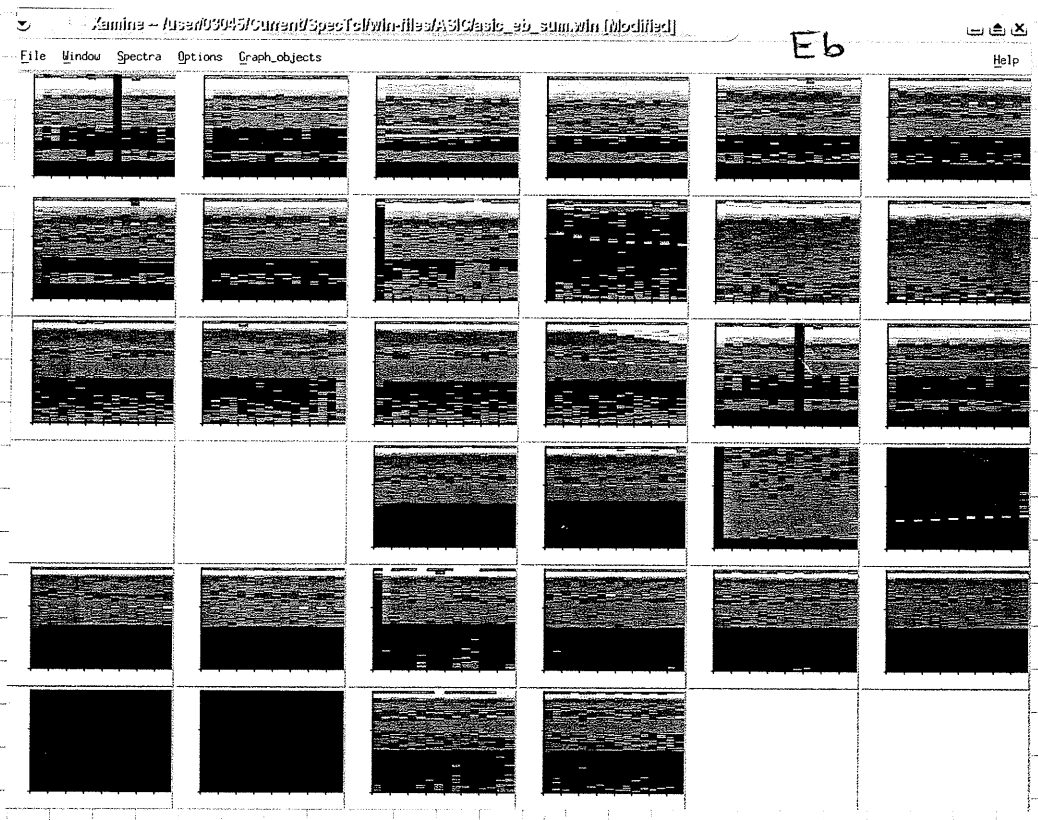


dE



E

Runs 390-394



Eb

Run# 395	Start : 7:30 Stop:	Date: 11/1/2006 26
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA (S1 mult 2+4π HiRA singles 4π singles	On shift: Daniela Sergei
Comments: continuation of data taking		

Run# 396	Start : 08:47 Stop:	Date: 11/2/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Andy Alisher
Comments: Same as before		

9:54 Threshold on CSI changed from 162 mV to ... back to 162mV. We were unable to change multip., according to scopr.

Run# 397	Start : 9:53 Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Andy, Bill Alisher
Comments: Continuation of data taking		

Run# 398	Start : 10:18 Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Andy Bill Alisher
Comments: Pulser testing		

10:18 Stopping the run for a minute.

10:40 Note: Pulser was working fine.

10:50 To change multip. on CsI, you have to go to the trig tab. not

10:50 Stopped to return charge multiplicity 2 to mult 1. Now running at mult 1.

Inputs

Gate + scaler: 1). Ball 30 mV
2). FA 30 mV
3). Ball + FA 30 mV 4). Unused (CsI) 67 mV (mult)
5). Unused 2 30 mV 6) Unused 3 30 mV
7) Unused 4 30 mV 8) Unused 5 30 mV
(All of these are enabled).

Trig: 1) Ball – Disabled 109 mV
2) ~~FA~~ Unused – Disabled
3) ~~Ball~~ FA – 105 mV – Disabled
4) Ball + FA 105 mV – Enabled
5) Unused 1 107 mV En
6) Unused 2 109 mV En
7) Unused 3 109 mV En
8) Unused 4 105 mV En

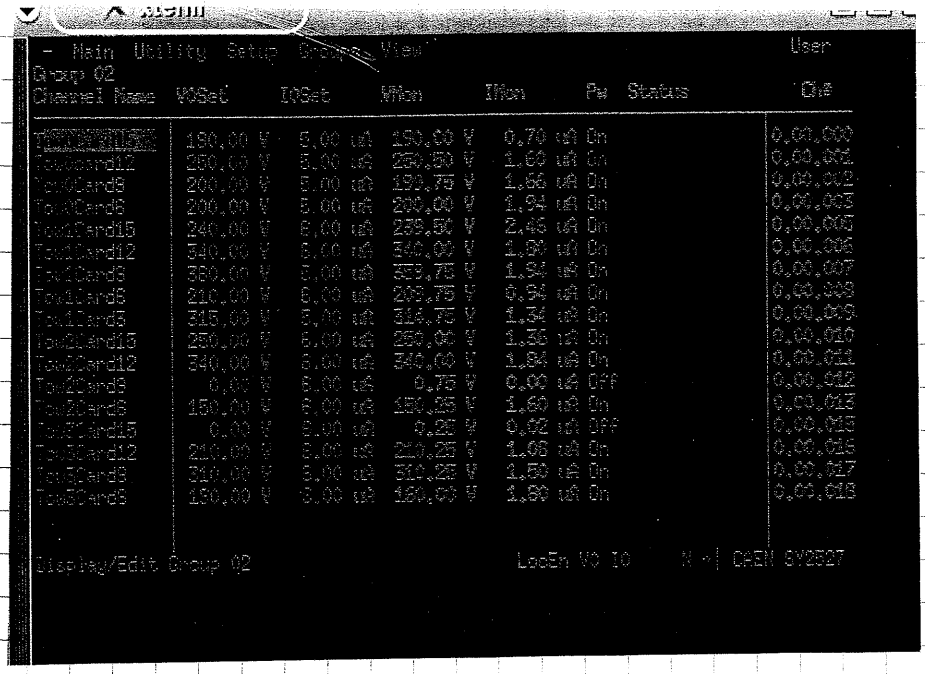
Run# 399	**Start :** 10:53 **Stop:** 11:40	**Date:** 11/2/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A=**80**MeV**	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:** Bill, Andy, Alisher
Comments: Multiplicity changed to 1. Live trigger 620.		

Run# 400	**Start :** 11:41 **Stop:** 12:31	**Date:** 11/2/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A=**80**MeV**	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:** Bill, Andy Alisher
Comments: Multiplicity back to 2. Title is wrong (mult)		

Run# 401	Start : 12:32 Stop: 12	Date: 11/26 /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Andy, Alisher
Comments: Same as before Staff caught in string exception, Readout frozen.		

Run# 402	Start : 12:42 Stop: 13:05	Date: 11/26 /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Andy, Alisher
Comments: Same as before		

Run# 403	Start : 13:4 Stop:	Date: 11/26 /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Andy, Alisher
Comments: Same as before		



Run# 404	**Start :** 14:49 **Stop:**	**Date:** 11/22/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A=** 80 **MeV**	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:** Bill, Andy, Sergei, Alisher
Comments: Same as before		

Run# 405	Start : 1608 Stop:	Date:11/ /2006 26
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: B. Lee
Comments: Same conditions as before		

Run 405, observed that requested threshold on CsI multiplicity dropped by itself, may have been triggering on some mult 1 events

Run# 406	Start : 16:55 Stop: 17:16	Date:11/ /2006 26
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Vlad, Micha, Serge, Dan
Comments: Same as before, reset CsI mult threshold to only trigger on mult 2		

Run# 407	Start : 17:16 Stop: 18:15	Date:11/ /2006 26
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Vlad, Micha Serge, Dan
Comments: Same as before		

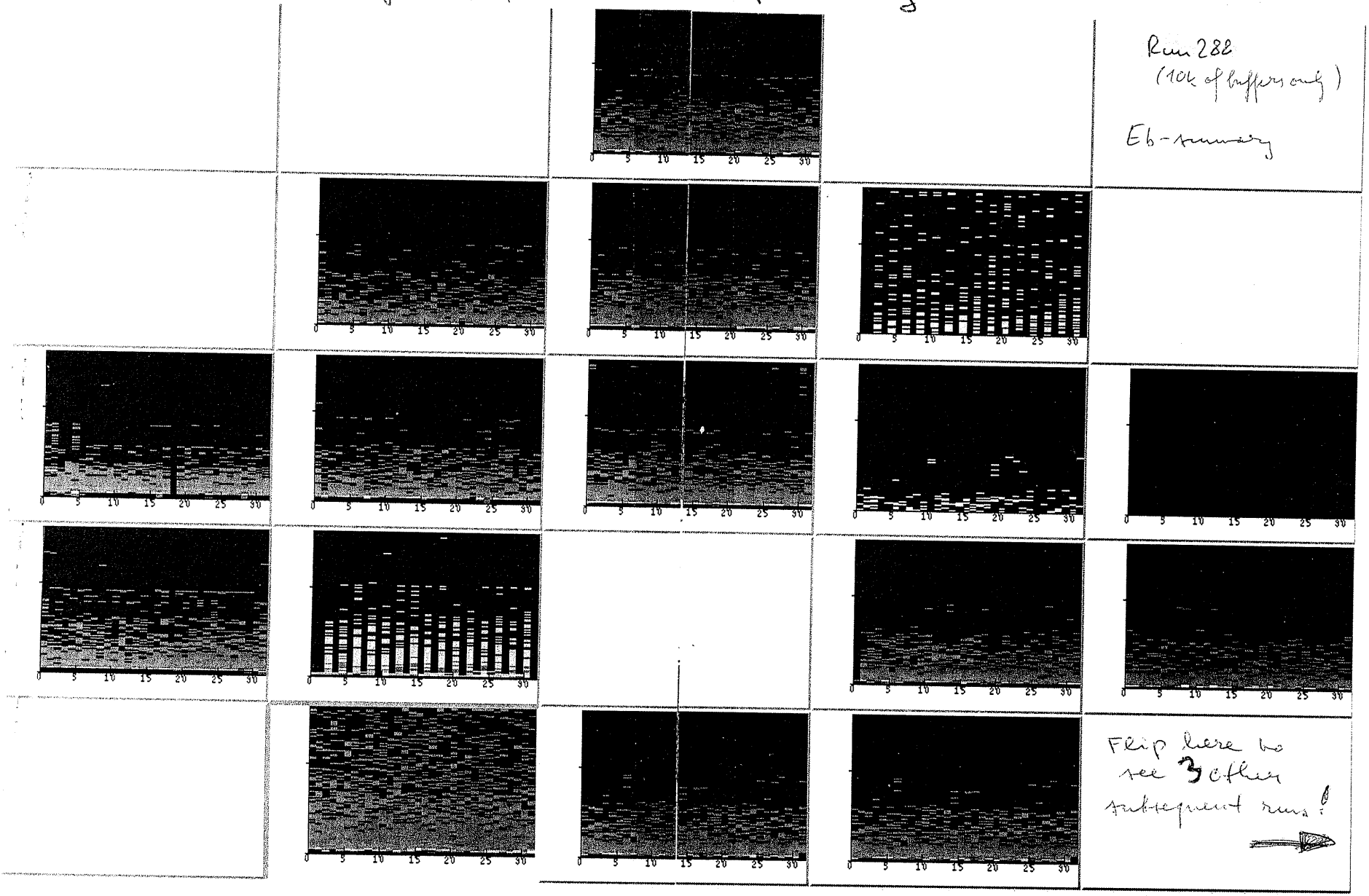
17:20 threshold levels appear to periodically shift: requested value is replaced by actual value. Watch out for this

Run# 408	Start : 18:16 Stop: 19:00	Date:11/ 26 /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Vlad, Micha, Sergei, Dan
Comments: changed to CsI mult 1		

Run# 409	Start : 19:00 Stop: 19:04	Date:11/ 26 /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Vlad, Micha, Sergei, Dan
Comments: Back to CsI mult 2. short		

Run# 410	Start : 19:28 Stop: 19:41	Date:11/ 26 /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill Vlad, Micha Sergei, Dan
Comments: CsI mult 2		

Note: It seems that E-back are running in a state condition; i.e. what is dead stays dead; what works keeps working



Run 282
(10k of buffers only)

Eb-summary

Flip here to see 3 other subsequent runs!

Run# 911	Start : 19,41 Stop:	Date:11/ /2006 26
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: B. Ll, Vlad, Sergei, Mich, Don
Comments: CsI mult 1		

20:00 : putting in views to tune different beam

20:15-20:45 trigger changed to "4π singles"

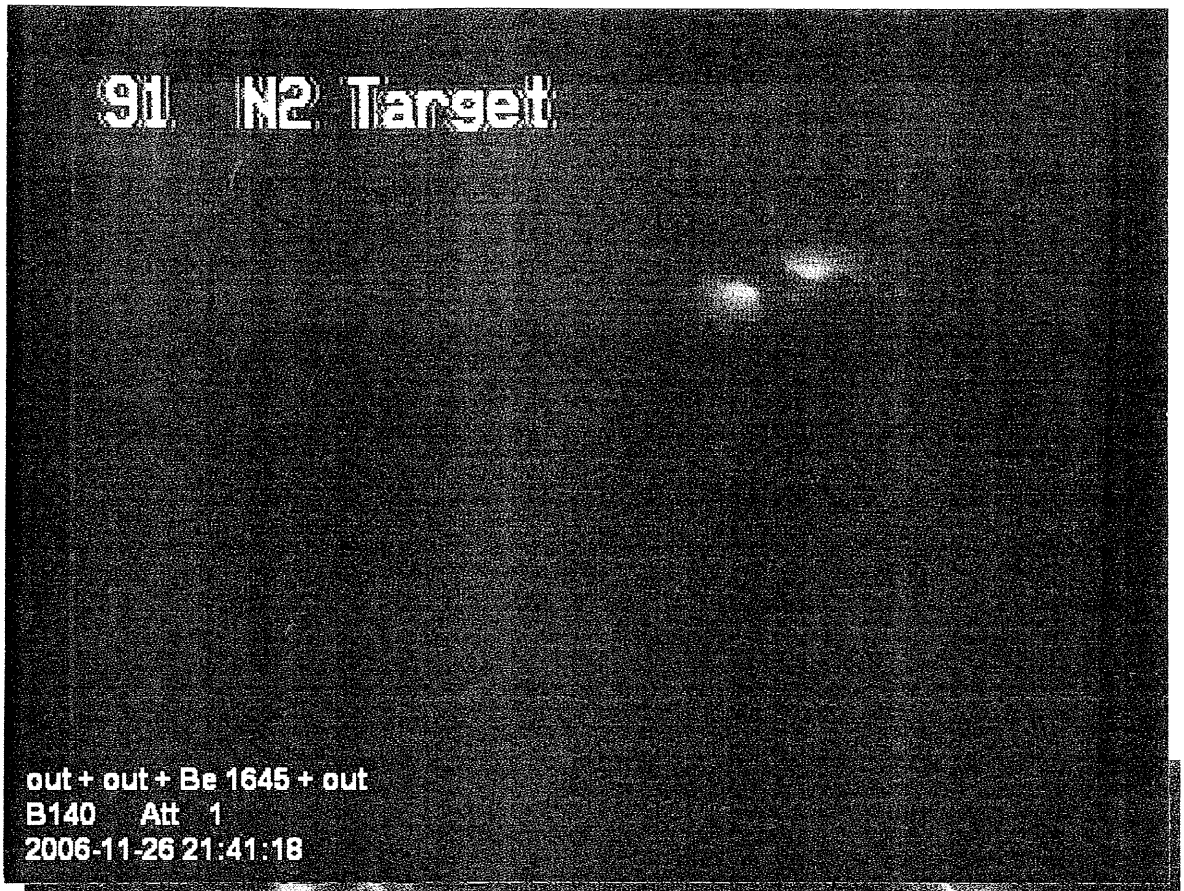
→ degraded to 25 MeV/u → ^{40}Ca beam

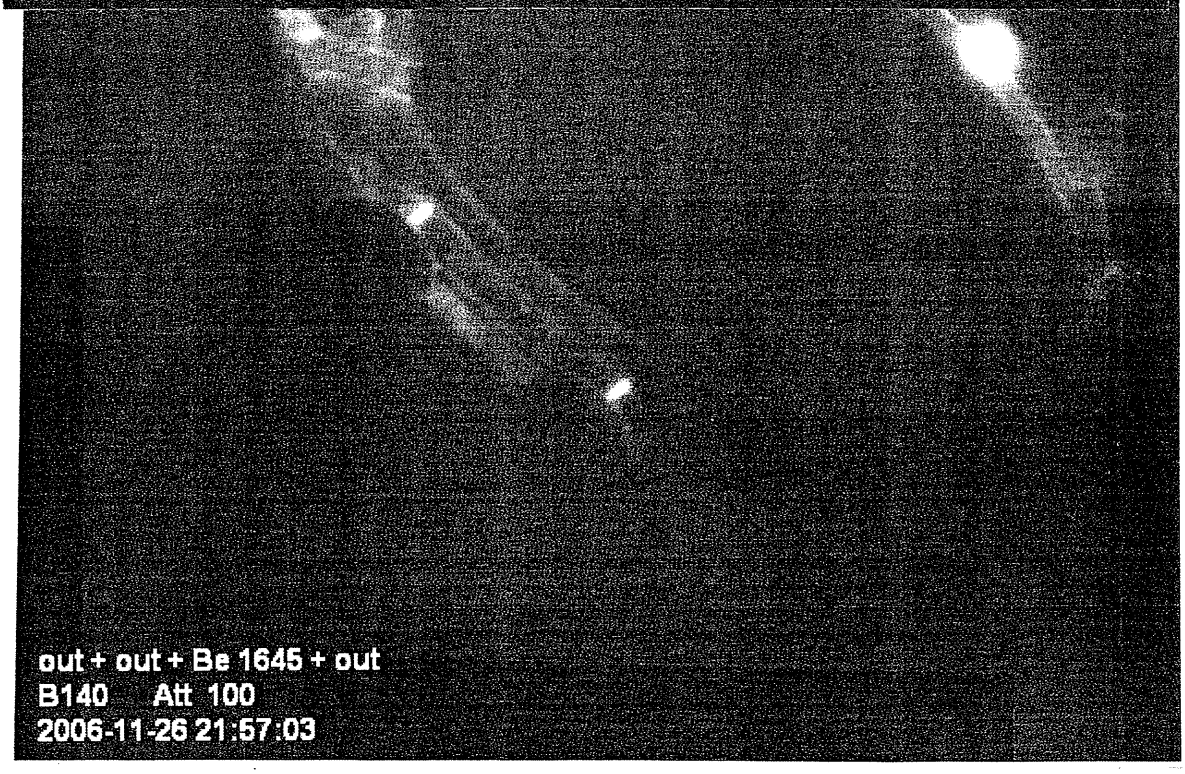
21:23 → beam getting on mirror

^{48}Ca is glued to lucky base B13

Chiller refilled

21:57 Empty target frame inserted





11:00PM - beam centered the best way we can

RUN412 → target in/out reference; empty target frame, XFP slits at 15 mm, beam centered on Ce at 25 A/cm²
↳ att.factor 1 → the highest beam intensity which is now available

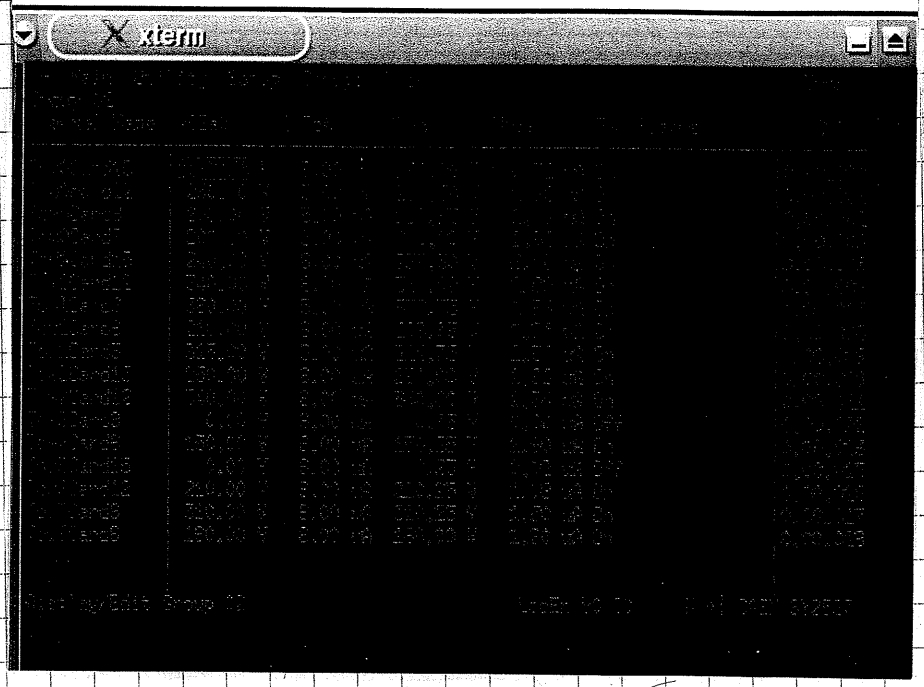
	RUN412	RUN413	ratio
FA1	193	320803	
FA2	161	341642	
FA3	112	343746	
FA4	203	346866	
FA5	350	319513	
FA6	166	316220	
FA7	69	292721	
FA8	95	285675	
FA9	149	249143	
FA10	147	286518	

11:21PM RUN413 → target in/out reference; ~~empty target~~ CH2 target in, XFP slits at 15 mm, beam centered on Ce at 25 A/cm² ✓
↳ att. factor 1 (5 min run)

```
A1900 "Print26Nov06_23h05.txt"    Sunday 23:05:31 2006-11-26  A1900
Moe V3   ***  Exp R412 40Ca20+ @ 25 MeV/u empty frame ***
Expt: 03045 "Two-particle Correlation Functions" [W. Lynch] Line: 4Pi Detector
Beam: 40 Ca 8+  12.35 MeV/nuc (K500) 20+ 140.00 MeV/nuc (K1200)
<Att    1>  ECR, Apertures: SCECR 150.0; 50.0; 25.0 mm SHVBI: 21.3800 kV
K500 a,b:    564 A,    433 A K1200:    689 A,   -214 A RF:  23.22390 MHz
       A1900 Optics: G19N2V1.data
       Rigidity       Field     Radius       (live)  Difference (Field*Radius)
Seg 0:  3.53650 Tm
Seg 1:  1.44800 Tm  0.46729 T  3.09882 m    3.09869 m    0.00412 % (1.44806 Tm)
Seg 2:  1.44800 Tm  0.46688 T  3.10148 m    3.10143 m    0.00159 % (1.44802 Tm)
Seg 3:  1.44800 Tm  0.46772 T  3.09559 m    3.09585 m   -0.00833 % (1.44788 Tm)
Seg 4:  1.44800 Tm  0.46762 T  3.09655 m    3.09654 m    0.00025 % (1.44800 Tm)
Seg 5:  1.44800 Tm
Z108DS              -0.44090 T  3.28494 m    3.28419 m    0.02279 %
Z001TL: out, Z013TL: out; Z014TL out
Z015TL: Be 1645, Z016TL out
Z030BC Beam Stop: -126.75 mm
Z037L,R:  -10.97,  16.02 mm; Z037DC:  out
Z057MS: 18 mm Cu, Z061MS: out
Z059DC: out, Z062SC: out, Z059TL: out
Z082 XC,G,YG:    1.17,  19.68,  20.03 mm Z082TL: out
Z101DC: out, Z102DC: out; Z103DC: out, Z105SC: out
Z104TL: out, Slits: nothing installed; PPACs: gas flowing
B110 Cent,Gap:    1.74,  14.85 mm; D110   -0.00,  -0.01 mm F110   -0.01,   0.20
B110DC: out, D110DC: out, D111DC: out, F110DC: out
```

```
A1900 "Print26Nov06_23h22.txt"    Sunday 23:22:33 2006-11-26  A1900
Moe V3   ***  Exp R413 40Ca20+ @ 25 MeV/u plastic tgt ***
Expt: 03045 "Two-particle Correlation Functions" [W. Lynch] Line: 4Pi Detector
Beam: 40 Ca 8+  12.35 MeV/nuc (K500) 20+ 140.00 MeV/nuc (K1200)
<Att    1>  ECR, Apertures: SCECR 150.0; 50.0; 25.0 mm SHVBI: 21.3800 kV
K500 a,b:    564 A,    433 A K1200:    689 A,   -214 A RF:  23.22390 MHz
       A1900 Optics: G19N2V1.data
       Rigidity       Field     Radius       (live)  Difference (Field*Radius)
Seg 0:  3.53650 Tm
Seg 1:  1.44800 Tm  0.46730 T  3.09882 m    3.09866 m    0.00524 % (1.44808 Tm)
Seg 2:  1.44800 Tm  0.46689 T  3.10148 m    3.10140 m    0.00262 % (1.44804 Tm)
Seg 3:  1.44800 Tm  0.46773 T  3.09559 m    3.09582 m   -0.00722 % (1.44790 Tm)
Seg 4:  1.44800 Tm  0.46761 T  3.09655 m    3.09657 m   -0.00080 % (1.44799 Tm)
Seg 5:  1.44800 Tm
Z108DS              -0.44090 T  3.28494 m    3.28419 m    0.02279 %
Z001TL: out, Z013TL: out; Z014TL out
Z015TL: Be 1645, Z016TL out
Z030BC Beam Stop: -126.75 mm
Z037L,R:  -10.97,  16.02 mm; Z037DC:  out
Z057MS: 18 mm Cu, Z061MS: out
Z059DC: out, Z062SC: out, Z059TL: out
Z082 XC,G,YG:    1.17,  19.68,  20.03 mm Z082TL: out
Z101DC: out, Z102DC: out; Z103DC: out, Z105SC: out
Z104TL: out, Slits: nothing installed; PPACs: gas flowing
B110 Cent,Gap:    1.76,  14.85 mm; D110   -0.00,  -0.01 mm F110   -0.01,   0.20
B110DC: out, D110DC: out, D111DC: out, F110DC: out
```

11/26/06 21:40

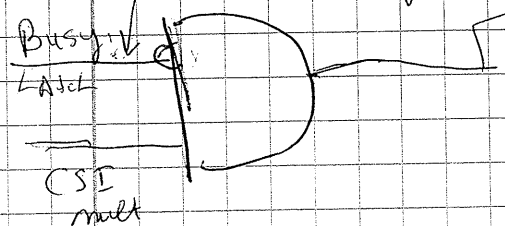


Switch to record trigger trigger shown on facing page

found error in setup from Vladimir

ABCD add on in Hira 4π coincidence module.

Put in 25Ω no delay



output X1M trigger
put into 4pi + HiRA coincidence
(it was out of there)

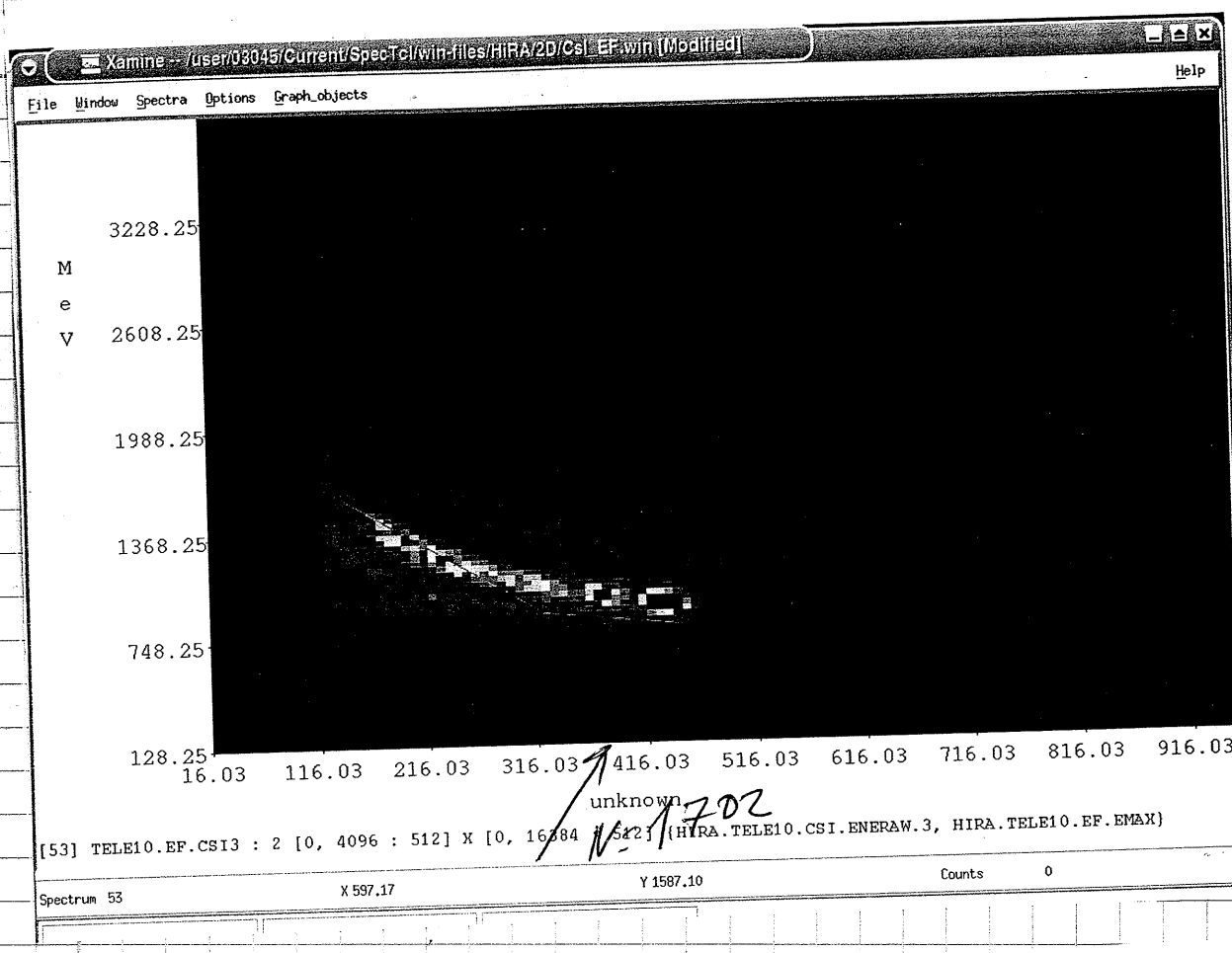
4mas 415 ÷ 417 are Junk

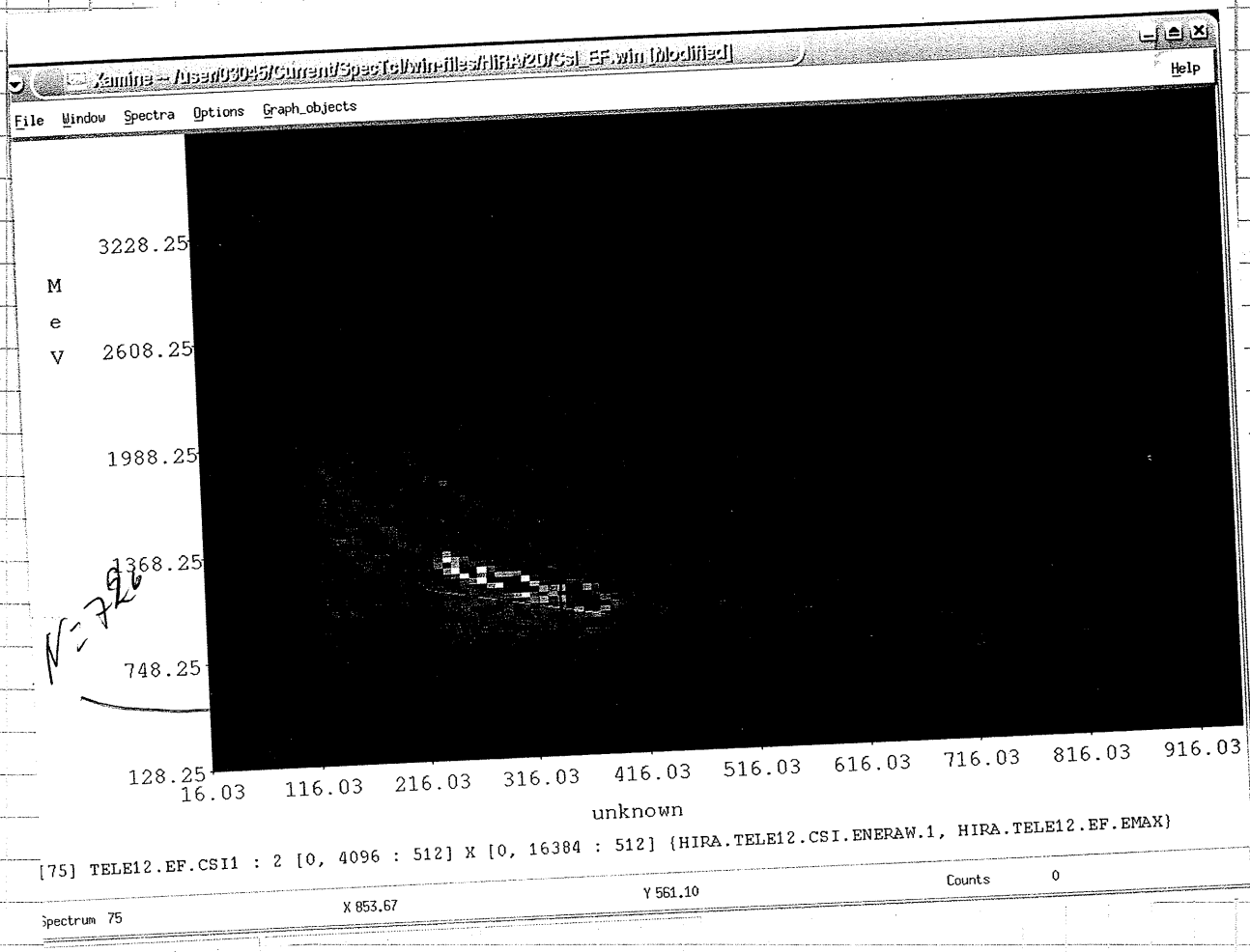
Run# 418	Start : 2:44 Stop:	Date: 11/ 27 /2006
Beam: • ^{40}Ca (circled) • ^{48}Ca • p • alpha source E/A= 25 MeV	Target: CH2 ^{40}Ca mylar ^{48}Ca plastic (circled) Trigger: CsI veto 4π 4π + HiRA HiRA singles 4π singles	On shift: Bill Daniele Sergei
Comments: Trigger problem fixed		

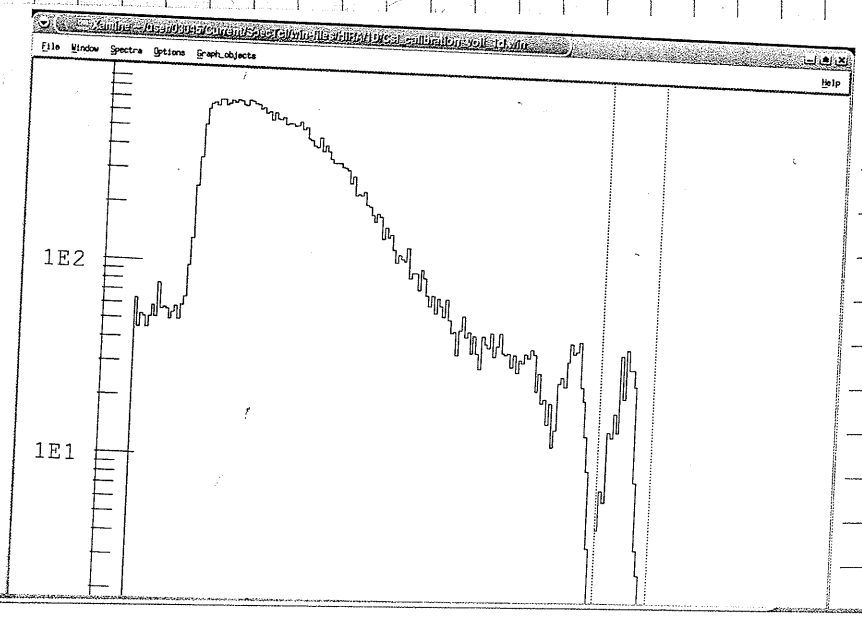
Run# 419, 420	Start : Stop:	Date: 11/ 27 /2006
Beam: • ^{40}Ca (circled) • ^{48}Ca • p • alpha source E/A= 25 MeV	Target: CH2 ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Daniele Betty Sergei
Comments: same as previous		

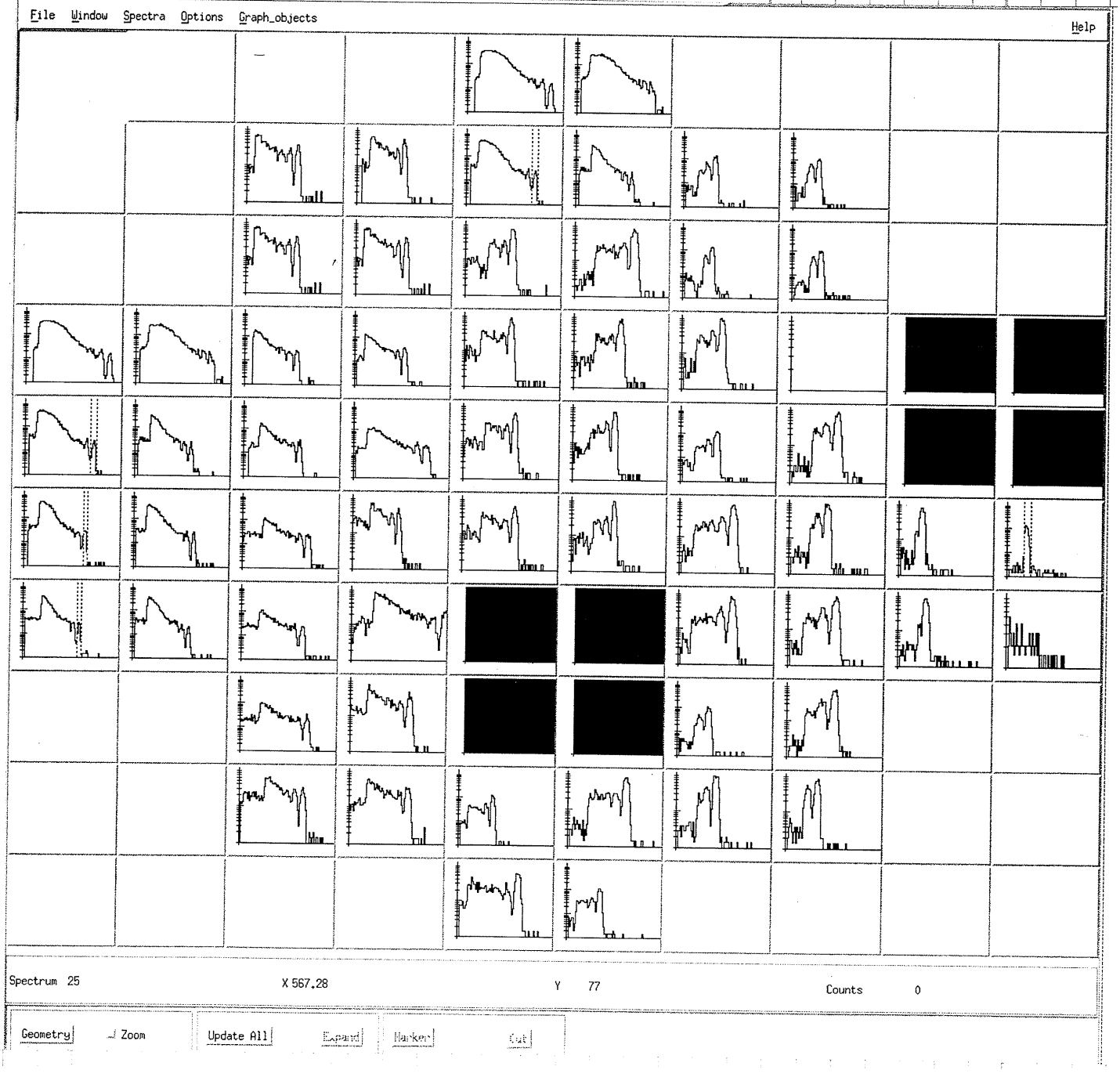
Emittance was chang[ed]

Run# 421	Start : Stop:	Date: 11/ 27 /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 25 MeV	Target: CH2 ^{40}Ca (circled) mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Sergei Daniele
Comments: ~~[illegible]~~ ~~mag~~hed. for 420		


Xamine -- /user/03045/Current/SpecTcl/win-files/HIRA/2D/Csi_EF.win [Modified]
File Window Spectra Options Graph_objects
Help
3228.25
M
e
V
2608.25
1988.25
1368.25
748.25
128.25
16.03 116.03 216.03 316.03 416.03 516.03 616.03 716.03 816.03 916.03
unknown
N=1702
[53] TELE10.EF.CSI3 : 2 [0, 4096 : 512] X [0, 16384 : 512] {HIRA.TELE10.CSI.ENERAW.3, HIRA.TELE10.EF.EMAX}
Spectrum 53
X 597.17
Y 1587.10
Counts 0


Xamine -- /user/03045/Current/SpecTcl/win-files/HIRA/2D/Csi_EF.win [Modified]
File Window Spectra Options Graph_objects
Help
3228.25
M
e
V
2608.25
1988.25
1368.25
748.25
128.25
16.03 116.03 216.03 316.03 416.03 516.03 616.03 716.03 816.03 916.03
unknown
N=726
[75] TELE12.EF.CSI1 : 2 [0, 4096 : 512] X [0, 16384 : 512] {HIRA.TELE12.CSI.ENERAW.1, HIRA.TELE12.EF.EMAX}
Spectrum 75
X 853.67
Y 561.10
Counts 0


File Window Spectra Options Graph_objects
Help
1E2
1E1


File Window Spectra Options Graph_objects
Help
Spectrum 25
X 567.28
Y 77
Counts 0
Geometry
Zoom
Update All
Expand
Marker
Cut

Run# 422	Start : 5:49 Stop:	Date:11/27/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=25 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA CsI mult 1 HiRA singles vetoed by 4π singles 4π	On shift: Sergei Daniela
Comments: Continuation of data taking		

Run# 423	Start : 06:49 Stop:	Date:11/ /2006 27
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=25 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic CH_2 Trigger: 4π + HiRA CsI mult HiRA singles 1 vetoed 4π singles by 4π	On shift: D.H. S.L
Comments: We ask higher beam intensity.		

Maybe, this run is JUNK due to DAQ problem?

Run# 424	Start : 06:57 Stop:	Date:11/ /2006 27
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic CH_2 Trigger: 4π + HiRA same HiRA singles as before 4π singles	On shift: S.L. D.H
Comments: Same conds as before		

Run# 424	Start : 7:31 Stop:	Date: 11/ /2006 27
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A ≷ MeV	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles same as before	**On shift:** D. M. S. L
Comments: Same cond. as before		

8:00 Statistics estimate for CSI calibration

Live-trigger ... ~350

100 MB ... ~ 20 min

currently available ... 1350 Mb ... 4 hours of data taking

	count rate @ tele 17 reference	RUN 420 100 Mb	RUN 422 150 Mb
tele 17 ... CSI 1	765	845 (+80)	1003 (+158)
2	882	1000 (+118)	1194 (+194)
3	982	1107 (+125)	1318 (+211)
0	869	991 (+122)	1170 (+179)

1350 Mb ... ~1500 counts @ tele 17

⇒ estimated ~4h needed to get 3000 counts

Run# 425	Start : Stop: 07:30:59	Date:11/ /2006 27
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=25MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA same as before HiRA singles 4π singles	On shift:
Comments: Readout crashed during run. Unable to grab basses		

Run# 426	Start : Stop:	Date:11/ /2006 27
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=25 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA same as before HiRA singles 4π singles	On shift:
Comments: Trigger on CsI vetoed with 4pi		

11/27/06 10:15. beam is not available.

Run# 427	Start : Stop:	Date:11/ /2006 27
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=25MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA same as before HiRA singles 4π singles	On shift:
Comments: junk		

Run# 428	Start : Stop:	Date:11/ /2006 27
Beam: ◉ ^{40}Ca • ^{48}Ca • p • alpha source E/A= 25 MeV	Target: ^{40}Ca mylar ^{48}Ca (plastic)	On shift:
	Trigger: 4π + HiRA HiRA singles 4π singles — same as before	
Comments: Operator increased beam intensity from 60 counts per seconds to 215 counts/sec		

readout program crashed

failed grabed buses on Hcard 1, slot 18

Run# 429	Start : Stop:	Date:11/ /2006 27
Beam: ◉ ^{40}Ca • ^{48}Ca • p • alpha source E/A= 25 MeV	Target: ^{40}Ca mylar ^{48}Ca (plastic)	On shift:
	Trigger: 4π + HiRA HiRA singles 4π singles — same as Before	
Comments: same readout crash like run 428		

11:05 am

~~11:10 am~~

Run# 430	Start : Stop:	Date:11/ /2006 27
Beam: ◉ ^{40}Ca • ^{48}Ca • p • alpha source E/A= 25 MeV	Target: ^{40}Ca mylar ^{48}Ca (plastic)	On shift:
	Trigger: 4π + HiRA HiRA singles 4π singles — same as before	
Comments: same readout crash		

11:10 am

Run# 431	Start : 11:11am Stop: 11:12	Date:11/ /2006 27
Beam: (•) ^{40}Ca • ^{48}Ca • p • alpha source E/A= 25 MeV	Target: ^{40}Ca mylar ^{48}Ca (plastic) Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Same as before
Comments: decision to restart VME-crade		

11:12am restarting VME-crade
toning beam up to 80 MeV

Run# 432	Start : 11:39 am Stop:	Date:11/ /2006 27
Beam: (•) ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca (plastic) Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Same
Comments: readout program crashed		

Tele19, CsI 1, problematic, loss in statistics
(does not trigger correctly?)

Run# 433	Start : 11:46 Stop: 11:50	Date:11/ /2006 27
Beam: • (40Ca) • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca (plastic) Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Same
Comments: ~~readout crashed~~ readout crashed		

Run# 439	Start : 11:55 Stop:	Date:11/ 27 /2006
Beam: • (circled) ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca (circled) plastic Trigger: same as before 4π + HiRA HiRA singles 4π singles	On shift:

Comments: CsI trigger vetoed to 4pi

Run# 439	Start : Stop:	Date:11/ /2006
Beam: • (circled) ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca (circled) plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:

Comments: crashed

Run# 440	Start : Stop:	Date:11/ /2006
Beam: • (circled) ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic CH_2 Trigger: 4π + HiRA HiRA singles 4π singles	On shift:

Comments: short run

14 oo 11/2→/06

We replaced target to ^{40}Ca and trigger condition

Threshold file 0 Spectra saved as Cs2-Threshold.sp0

Tel	Ch		Tel	Ch		Tel	Ch	
0	0	71	6	0	74	12	0	64
	1	43		1	82		1	92
	2	66		2	65		2	73
	3	85		3	90		3	62
1	0	76	7	0	72	13	0	84
	1	85		1	78		1	69
	2	72		2	102		2	64
	3	52		3	109		3	84
2	0	77	8	0	51	16	0	94
	1	88		1	83		1	72
	2	62		2	78		2	85
	3	80		3	71		3	54
3	0	50	9	0	79	17	0	77
	1	64		1	75		1	85
	2	94		2	74		2	79
	3	78		3	75		3	87
4	0	80	10	0	111	19	0	[illegible]
	1	66		1	65		1	[illegible] 84
	2	73		2	68		2	[illegible] 94
	3	84		3	68		3	82
5	0	99	11	0	83			
	1	71		1	100			
	2	73		2	100			
	3	81		3	91			

Experimental N-CsI=2 run 340

Tel	Ch		Tel	Ch		Tel	Ch	
0	0	133	6	0	100	12	0	119
	1	110		1	100		1	119
	2	110		2	100		2	119
	3	129		3	110		3	119
1	0	119	7	0	119	13	0	119
	1	119		1	120		1	119
	2	138		2	120		2	119
	3	150		3	120		3	119
2	0	99	8	0	120	16	0	119
	1	110		1	120		1	119
	2	100		2	120		2	119
	3	110		3	120		3	119
3	0	99	9	0	119	17	0	119
	1	99		1	119		1	121
	2	113		2	119		2	119
	3	100		3	119		3	131
4	0	130	10	0	119	19	0	119
	1	128		1	119		1	119
	2	130		2	119		2	119
	3	148		3	119		3	119
5	0	110	11	0	119			
	1	99		1	119			
	2	99		2	119			
	3	99		3	119			

Run# 441	Start : 15:19 15:20 Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=30 MeV	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA same HiRA singles as before 4π singles	**On shift:** Bill Betty, Vlad, Panida, Alisher
Comments: CsI short 0 thresholds on		

N_CsI = 1 run 339

Tel	Ch		Tel	Ch		Tel	Ch	
0	0	148	6	0	171	12	0	144
	1	134		1	185		1	209
	2	116		2	186		2	171
	3	154		3	195		3	162
1	0	141	7	0	169	13	0	206
	1	150		1	183		1	175
	2	158		2	193		2	167
	3	150		3	225		3	161
2	0	171	8	0	125	16	0	179
	1	150		1	166		1	179
	2	154		2	137		2	203
	3	167		3	130		3	178
3	0	160	9	0	163	17	0	155
	1	166		1	146		1	126
	2	204		2	147		2	184
	3	167		3	155		3	167
4	0	156	10	0	194	19	0	186
	1	165		1	141		1	206
	2	150		2	144		2	192
	3	148		3	147		3	180
5	0	192	11	0	173			
	1	186		1	183			
	2	167		2	202			

Run# 442	Start : 15:33 Stop: 15:43	Date: 11/2/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Betty, Daniela, Vlad, Alisher, Sergei
Comments: New thresholds on CsI, may be some are not set right.		

Removed card

4π - Modules, which do not work

2A, 6B, 14E, 27E, 27F

Status of dE's, → Green highlighter represents new problem channels.

EB
Tele 2 CH 0,1,3,5,7,9,... 31 (odds broken)
Tele 4 CH 18 dead
Tele 11 All odd channels +0 are dead
Tele 13 (0)
Tele 16 ok

	PE
TELE0	CH 25
TELE 1	OK
TELE 2	CH 11
TELE 3	CH 10?, CH 16 - Dead
TELE 4	No DE's
TELE 5	CH 4, 12, (16?)
TELE 6	CH 4, 12, 25
TELE 7	CH (6) 12, (22), 30
TELE 8	OK
TELE 9	
TELE 10	CH 0, 13, 29
TELE 11	OK. CH 3 is firing
TELE 12	CH 04, 12
TELE 13	OK (31 slightly firing)
TELE 14	
TELE 15	
TELE 16	CH 11, 29
TELE 17	
TELE 18	
TELE 19	9, 12, 17

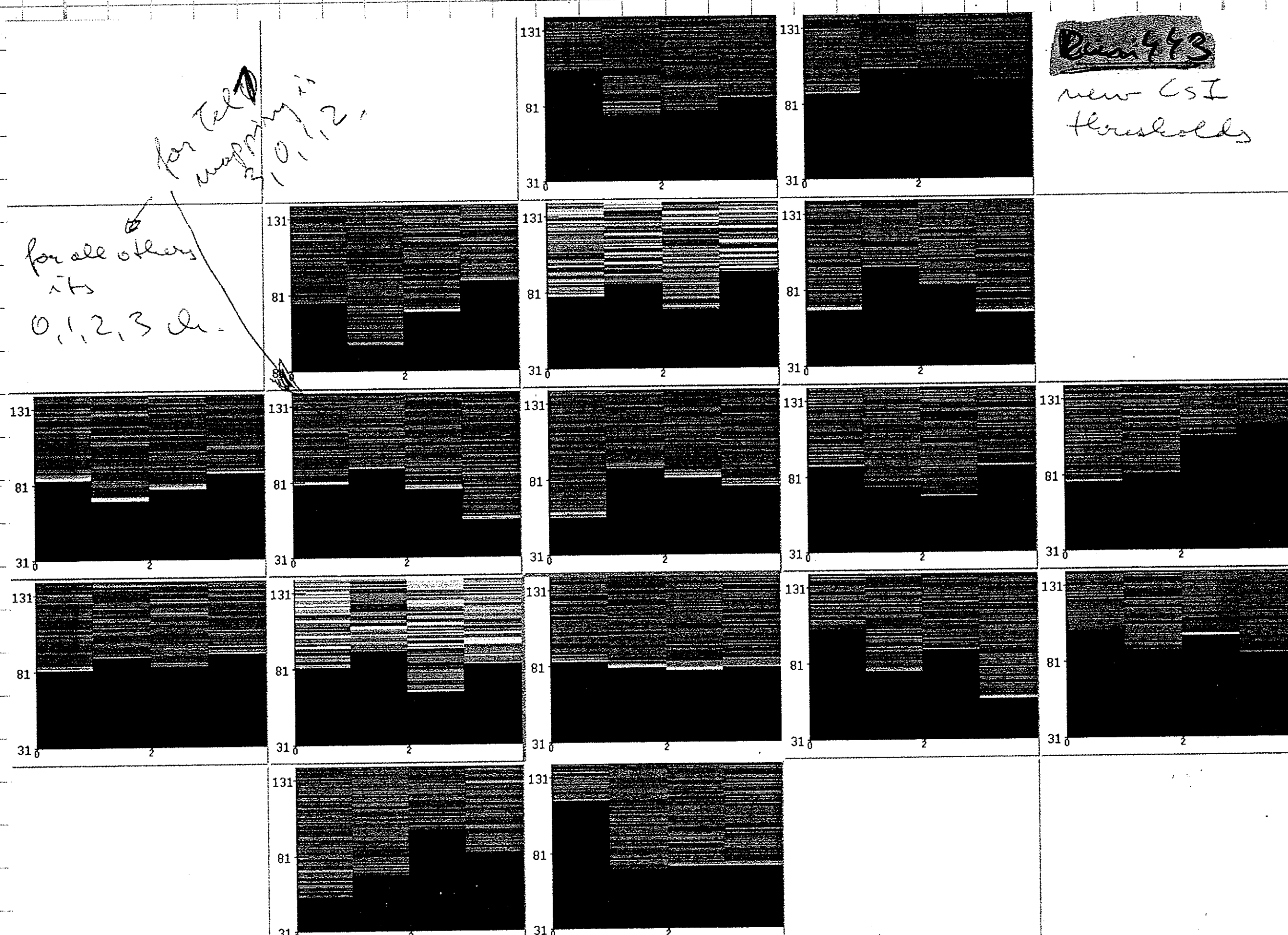
discovered that the CSI threshold file is not right and the threshold are
⇒ we decide to return to the ^{40}Ca-target and run with reduced - correct thresholds,

⇒ 1.) remove delay on CSI coin set coin to 6

2) put input of delayed 4π in fast clear, put output cable into J

3. put pulser into 4π, set pulser rate low

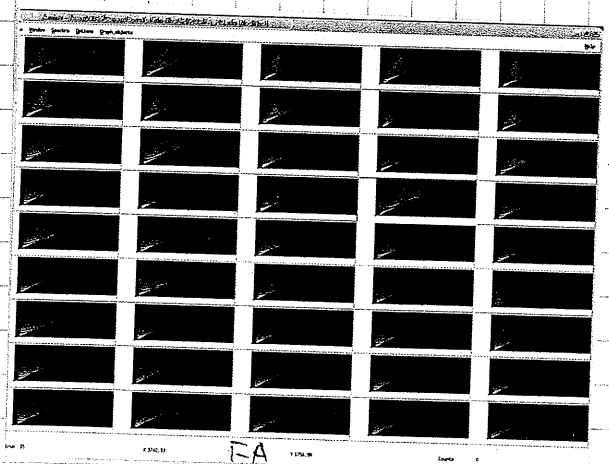
4

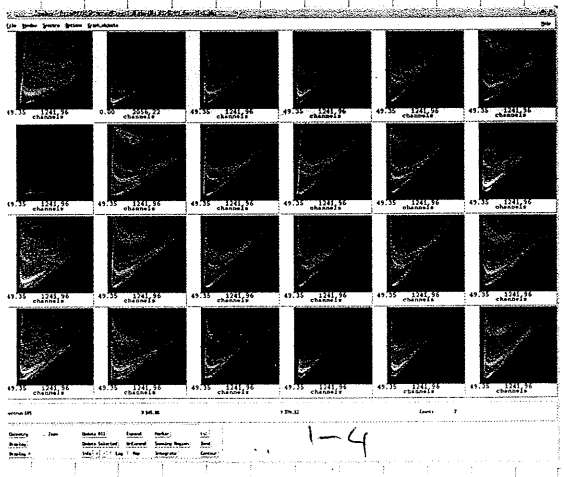


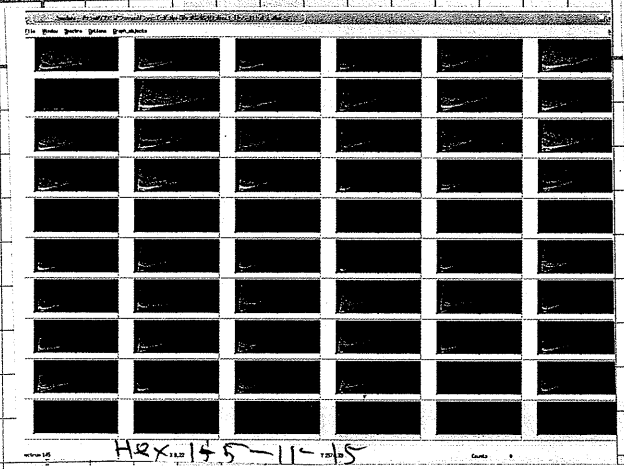
Run# 443	Start : 16:39 Stop: 17:17	Date: 11/7/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA CsI HiRA singles veto 4π singles on 4π	On shift: Bill, Betty, Vladimir, Micha, Alisher
Comments: Multiplicity 1 Thresholds finally set, run with trig on mult 2 in Ball+EA in coinc. with CsI mult 1.		

Run# 444	Start : 17:20 Stop:	Date: 11/7/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA CsI HiRA singles veto 4π singles on 4π	On shift: Bill, Betty Vladimir, Micha, Alisher
Comments: Multiplicity 2.		

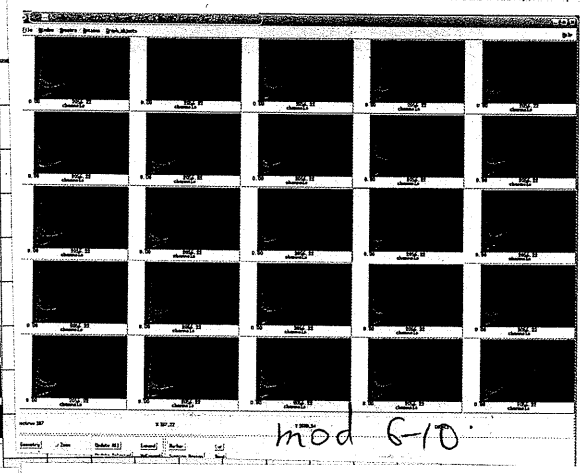
16:10



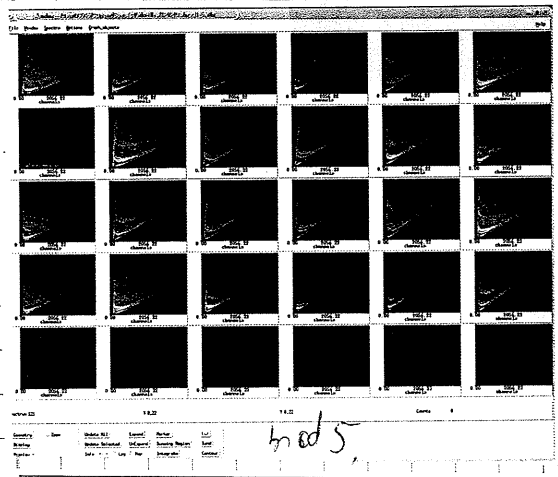




Hex 1 to 5 — 11 to 15

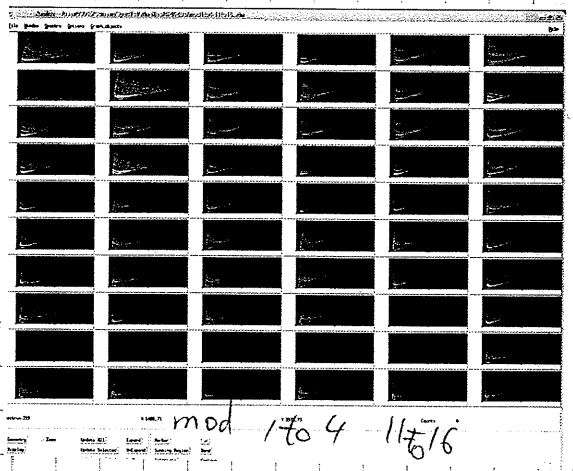


mod 6-10

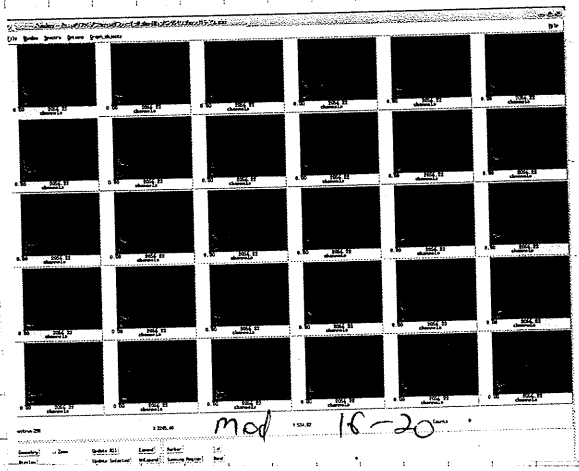


mod 5

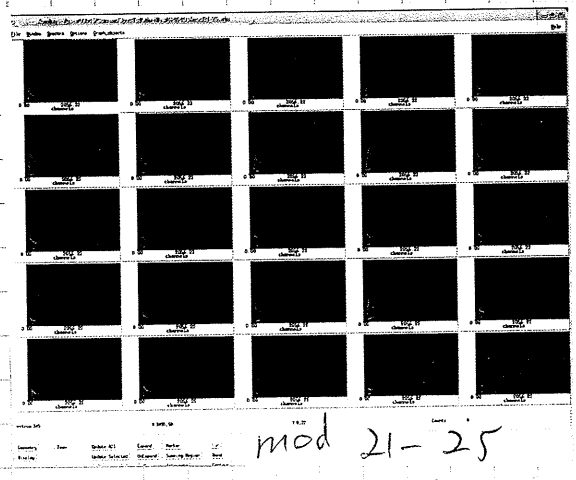
mod 11-15



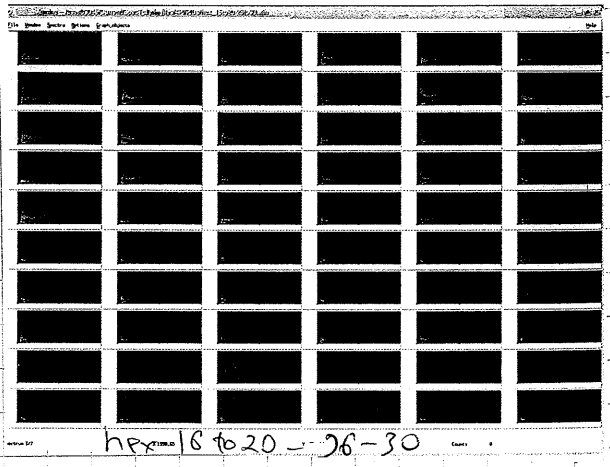
mod 1 to 4 11 to 16



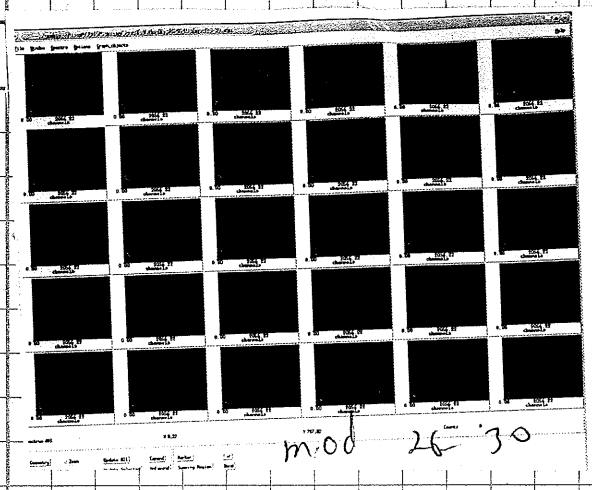
mod 16-20

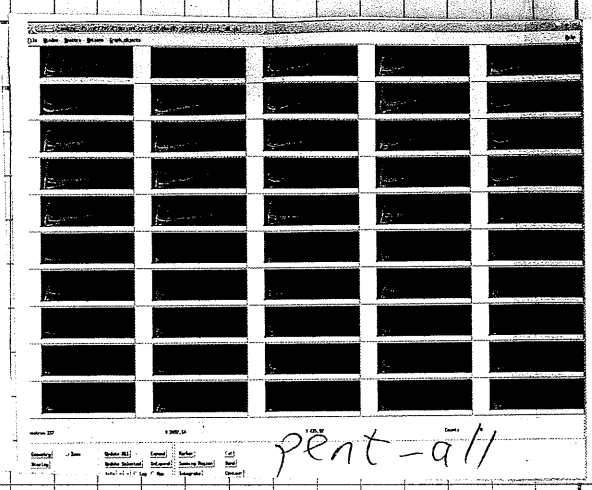


mod 21-25



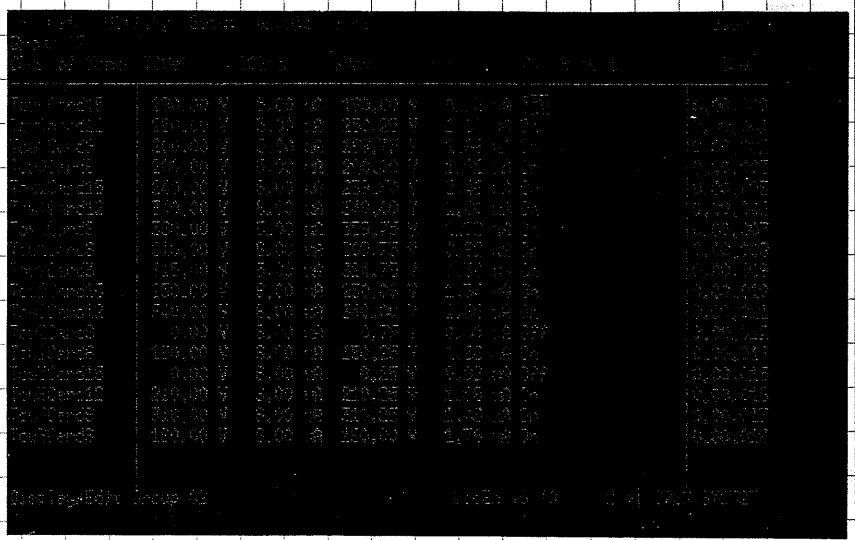
hex 16 to 20 — 26-30





Run# 445	Start : 18:12 Stop:	Date: 11/27/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: CsI multi 2 4π + HiRA HiRA singles 4π singles	On shift: Bill, Vlad, Micha Alisher
Comments: Exactly the same as 444		

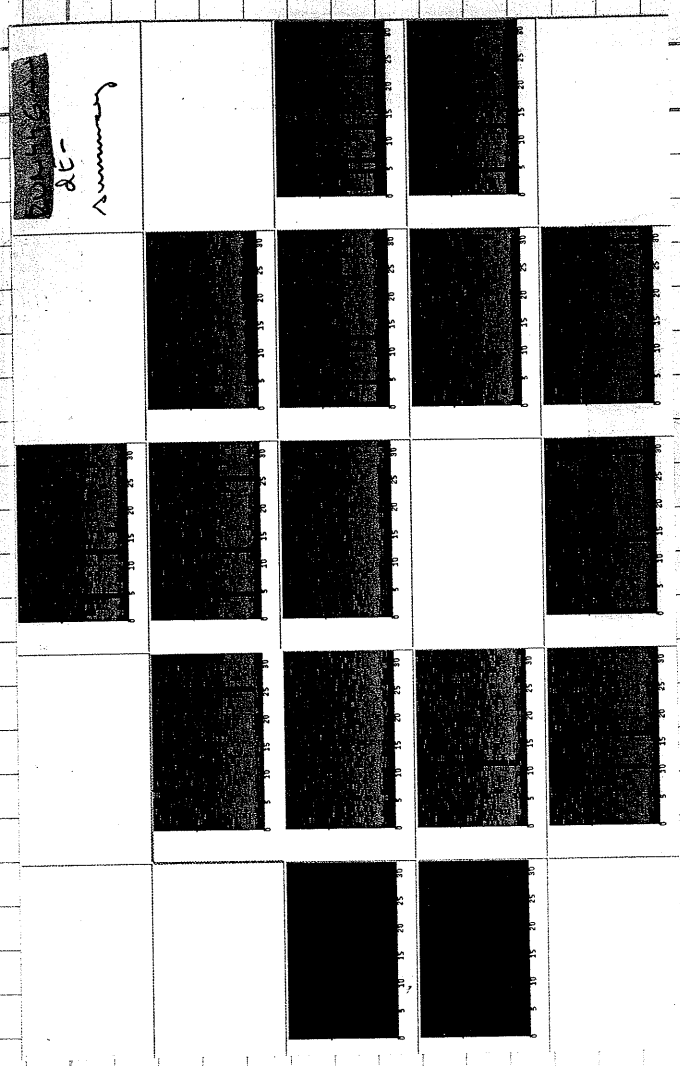
7:05 PM
11/27/2006

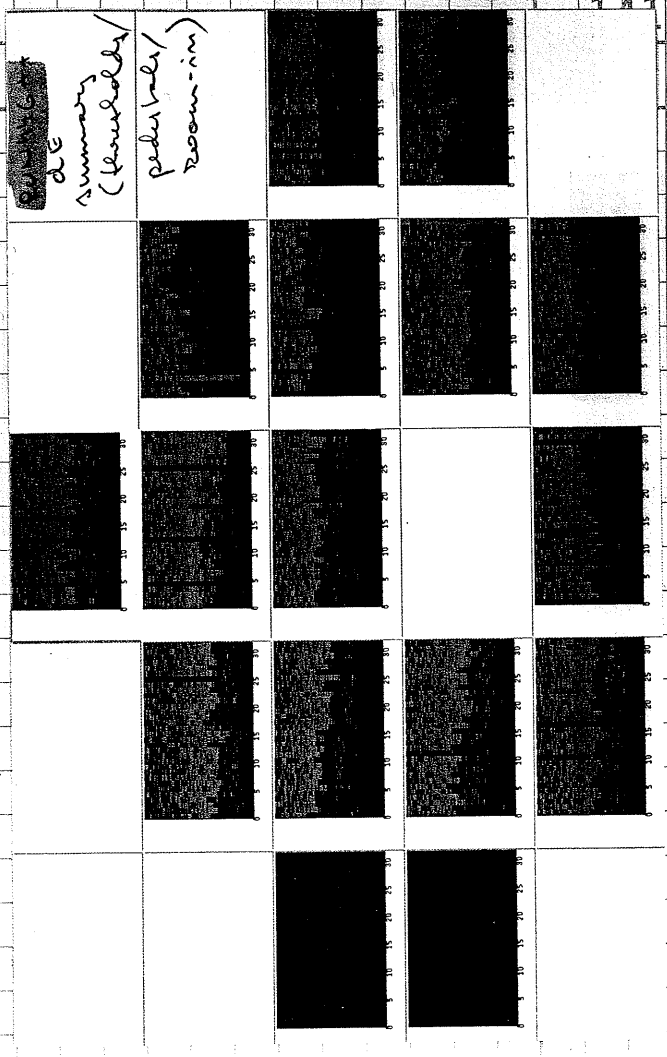


Run# 446	Start : 18:14 Stop: 18:22	Date:11/ /2006 27
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Vlad Micha, Dan
Comments: CsI mult 2 Same as previous		

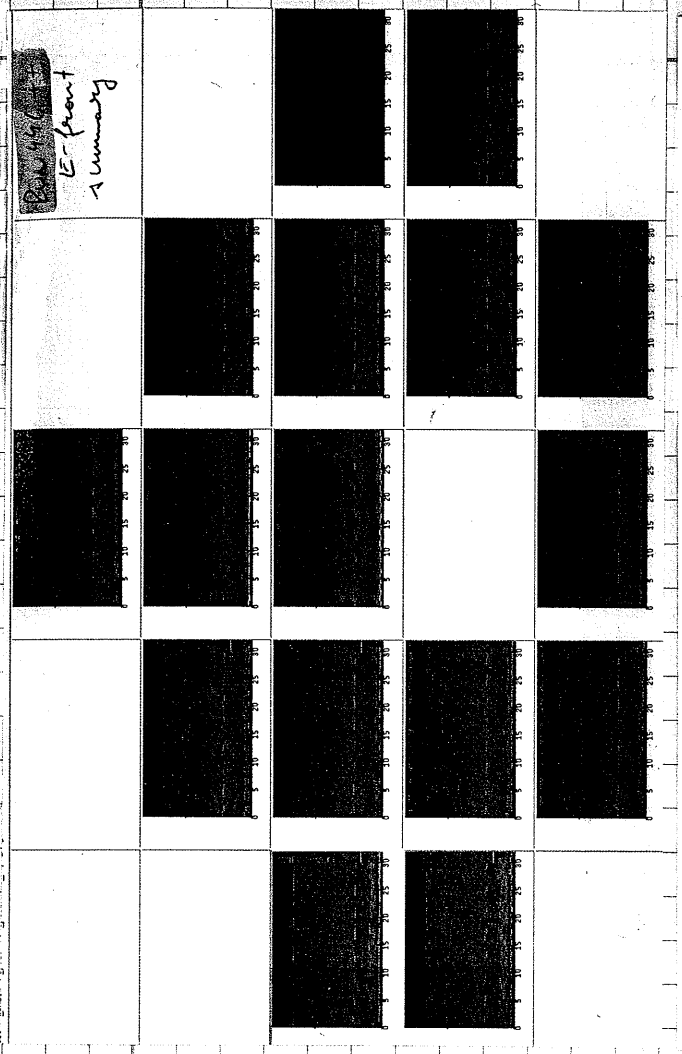
Run# 447	Start : 19:24 Stop: 19:41	Date:11/ /2006 27
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Bill, Vlad Micha, Dan
Comments: Scaler interval changed from 2s to 5s to reduce dead time		

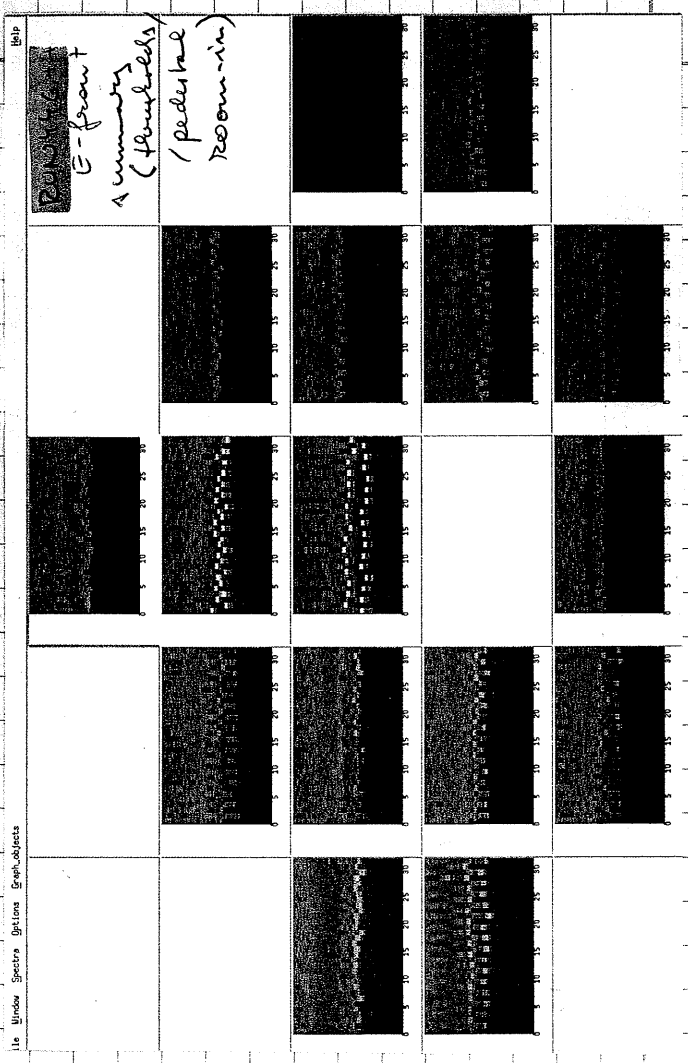
Run# 448	Start : 20:06 Stop:	Date:11/ /2006 27
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Vlad, Bill, Micha, Dan CsI-mult 2
Comments: Rerouted veto on deadtime scales to remove a malfunctioning fan in fan out		

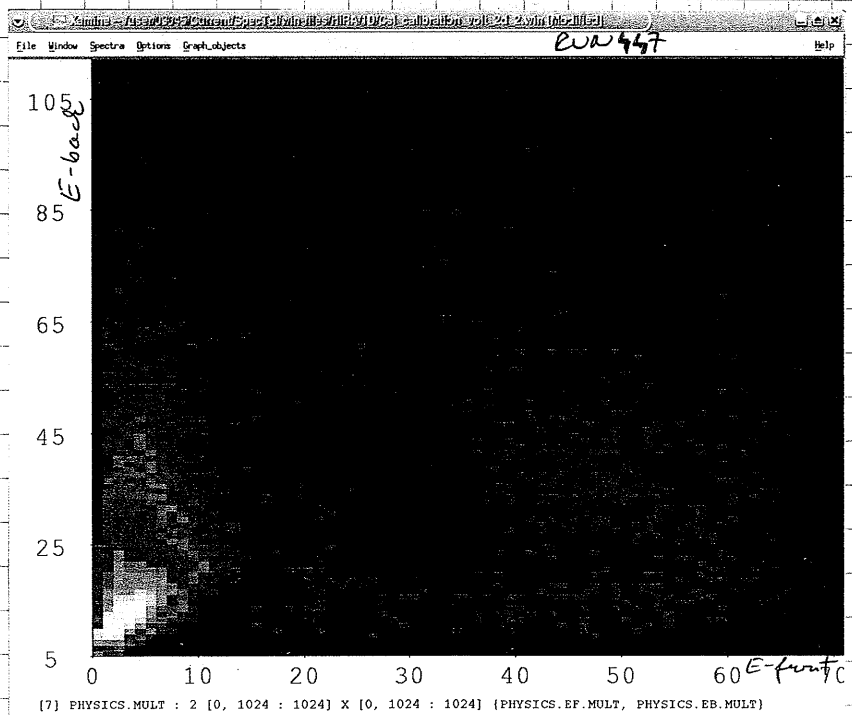




Run# 449	**Start :** 21:05 **Stop:** 21:58	**Date:** 11/ /2006 27
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A=** 80 **MeV**	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:** Bill Vlad, Micha, Daniel
Comments: same as previous		

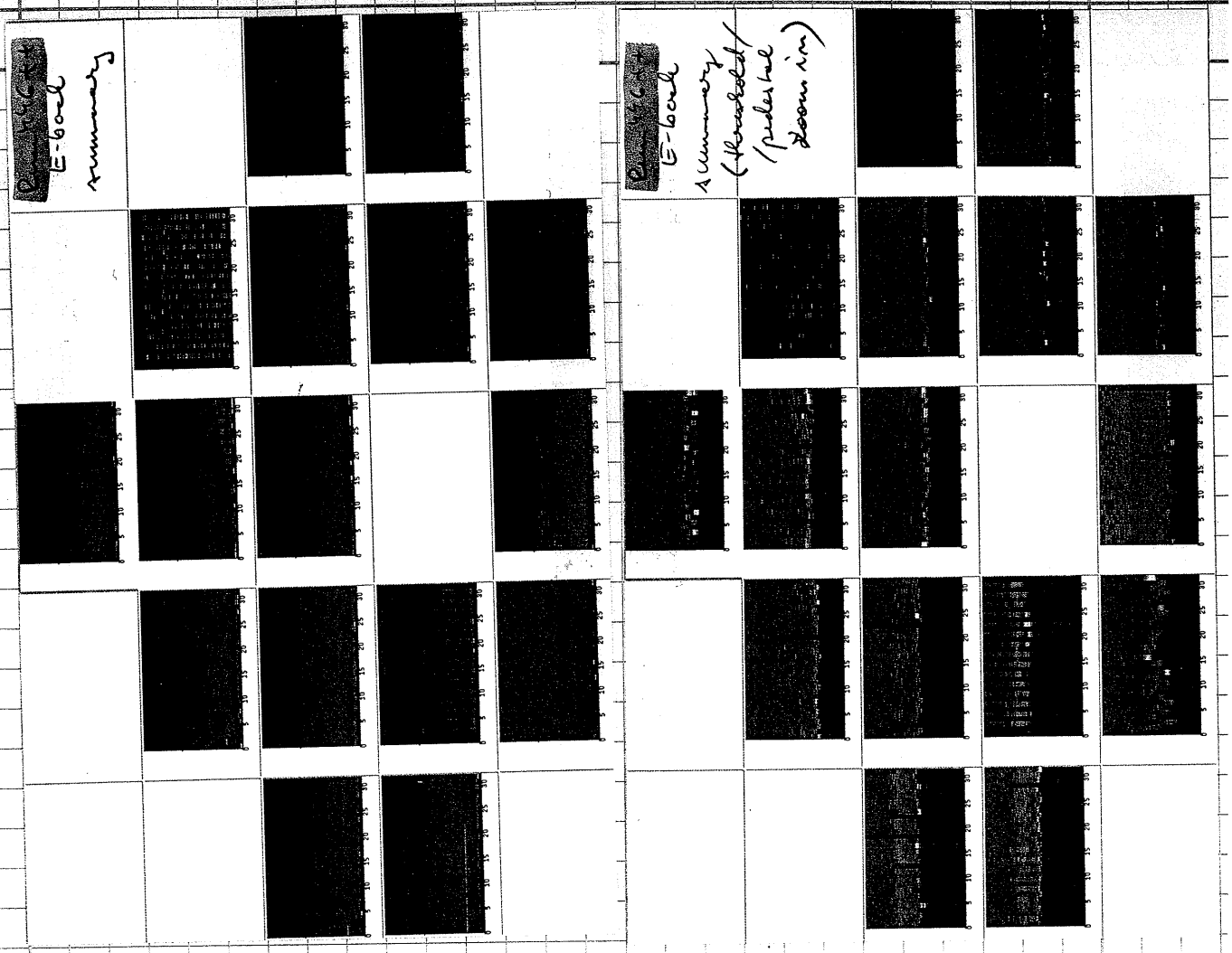






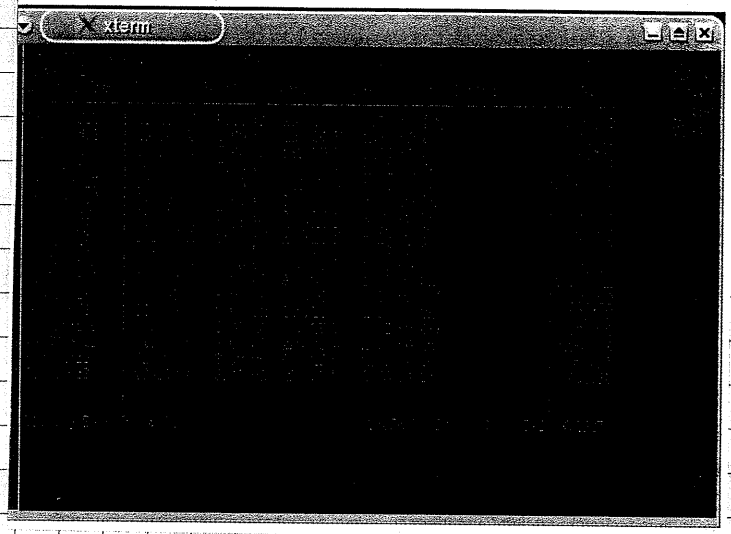
↳ total multiplicity on all E-fronts vs. all E-backs

↳ E-backs have generally more noise, but it's not so bad



Run# 450	**Start :** 21:58 **Stop:** 22:36	**Date:** 11/ /2006 27
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A=** 80 MeV	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:** Dan, Micha, Vlad, Beth
Comments: same as previous		

11/27/06
~~23:30~~



little change w/ most recent, but T1C9 and T2C12 show drift up over several days
compare p 47

T1C9 +.22 μA
T2C12 +.12 μA

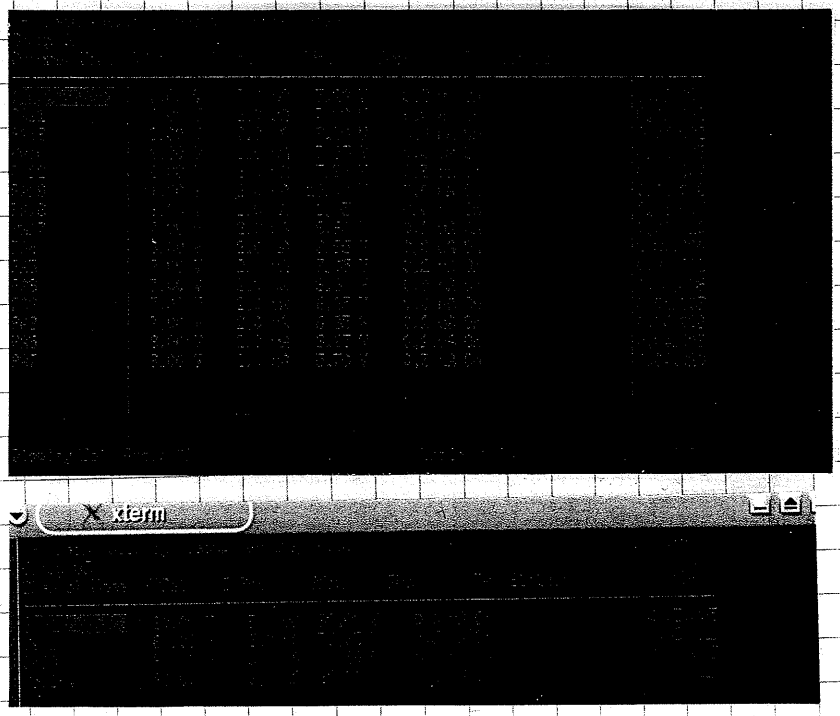
Run# 451, 452	**Start :** **Stop:**	**Date:11/ /2006** 27
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source **E/A=80 MeV**	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA / HiRA singles / 4π singles	**On shift:** Vlad, Micha, Betty, Dan
Comments: junk, no hira data; had to restart VME to make work		

23:45 Eb:

	V (V)	Leak I (μA)
EbT0	100.2	5.88
T1	100.1	8.56
T2	100.1	4.79
T3	100.1	4.32

Run# 453	Start : 23:51 Stop:	Date:11/ /2006 27
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80 MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Vlad, Dan, Micha, Beth
Comments: working again; had to restart VME after using Scalers		

From 23:30

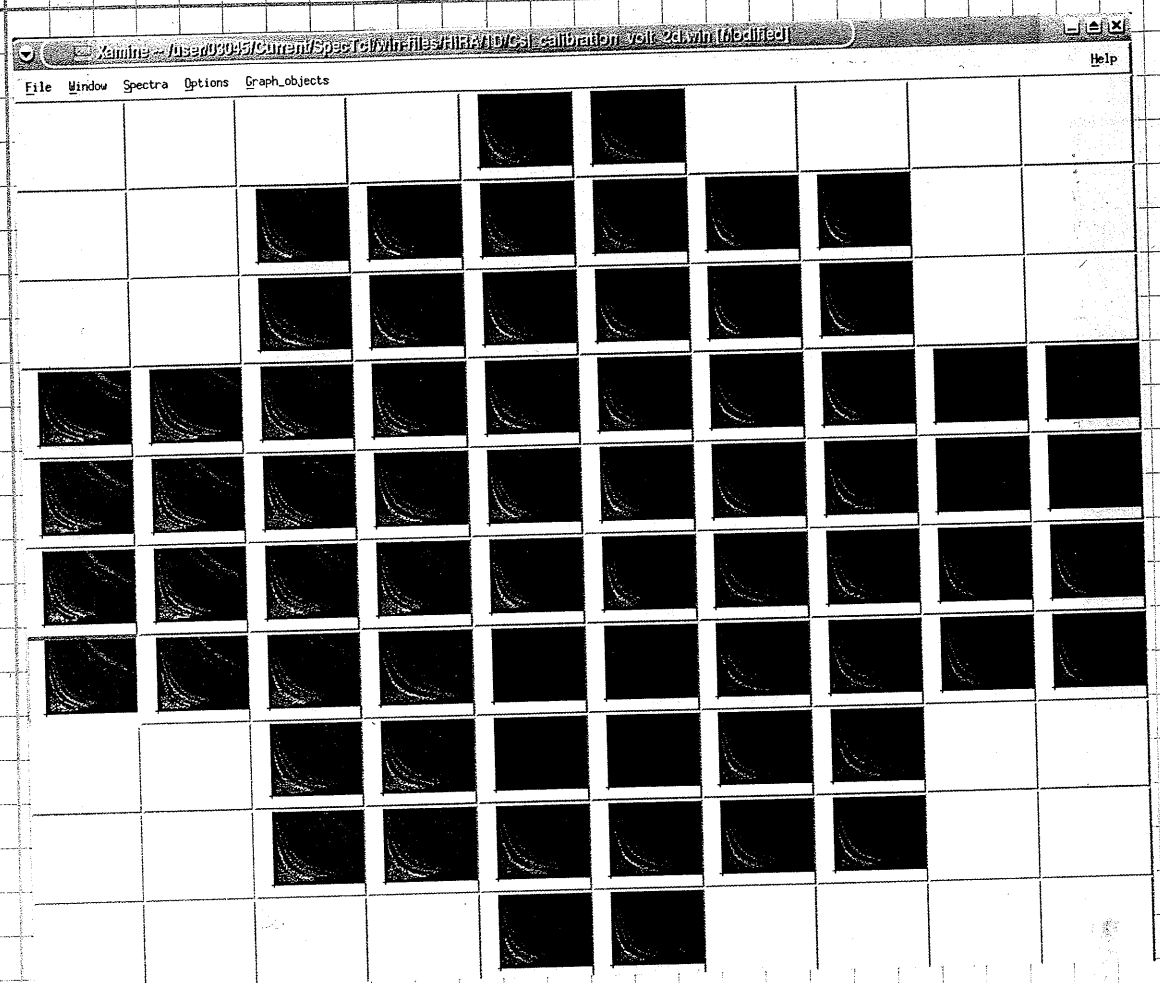


~~At the end of run # 453~~

"Requested thr ~~was shifted~~ to 100 mV instead of 185 mV

no problem

11/27/06
23:45



Run# 454	Start : Stop:	Date:11/ /2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=~~8~~ MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: D.H. S.L
Comments: Same cond. as previous runs		

Wrong threshold cond for this run

↳ threshold on Ball+FA set to 185mV (= meet. 3-4)

Run# 455	Start : Stop: 1:50	Date:11/1/2006 28
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA CsI mult 2+ 4π HiRA singles 4π singles	On shift: Sergei Daniela
Comments: Same cond as previous runs (457)		

Run# 456, 457, 458	Start : 1:50 Stop:	Date:11/ /2006 28
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA CsI mult 2+ 4π HiRA singles 4π singles	On shift: Sergei Daniela
Comments: continuation of data taking mult=2		

3:20 we changed multiplicity from 2 to 1 now.

Run# 459	Start : 03:24 Stop:	Date:11/ /2006 28
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: Multiplicity = 1		

We decreased beam intensity by 20%

Run# 460	Start : Stop:	Date:11/ /2006
Beam: • (circled) ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: (circled) ^{40}Ca mylar ^{48}Ca plastic Trigger: (circled) 4π + HiRA HiRA singles 4π singles	On shift: D.H. S.L
Comments: mult = 1		

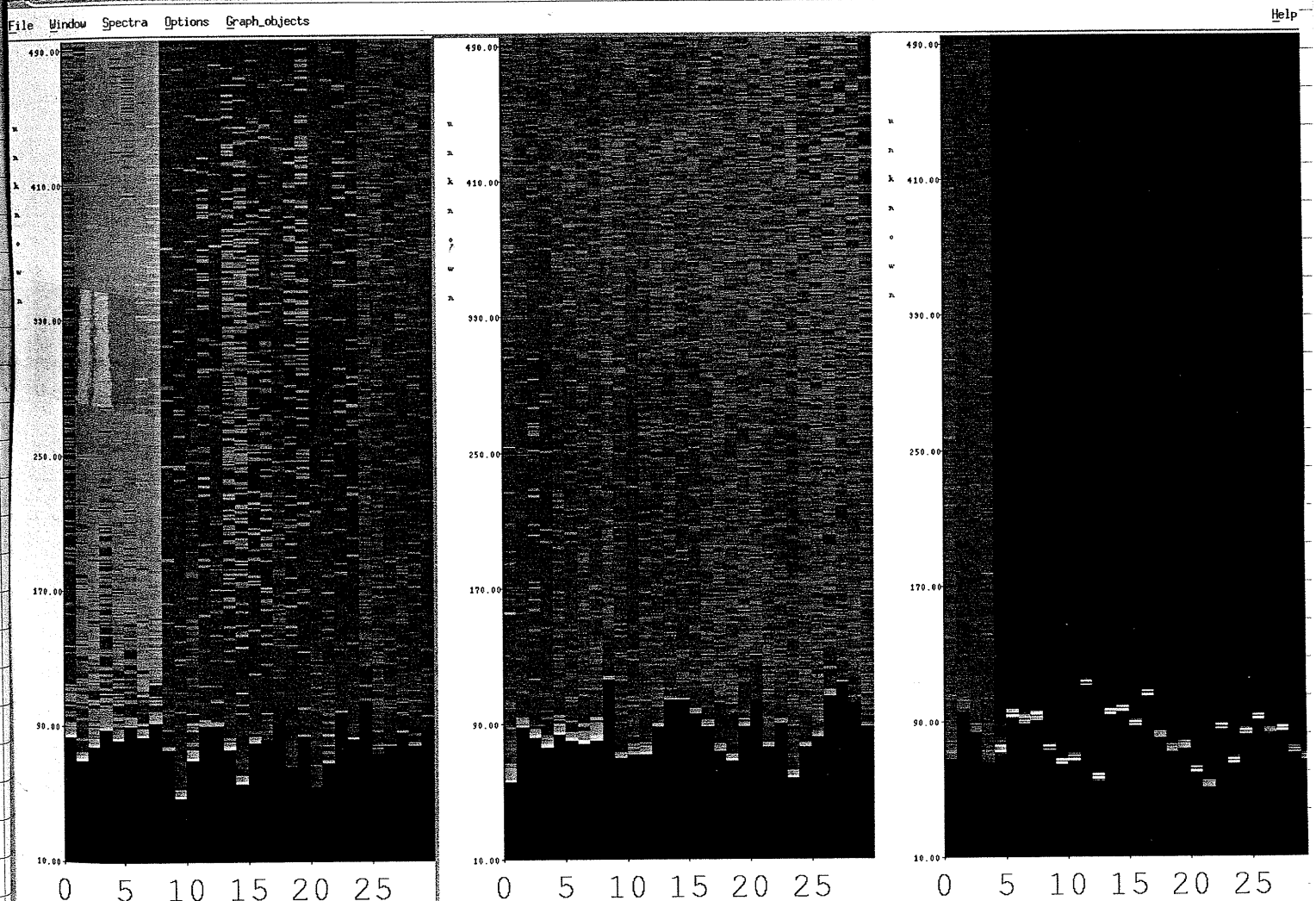
live ≈ 90%

decreasing beam int. again by 50%

Run# 461	Start : 4:00 Stop: 5:00	Date:11/ /2006
Beam: • (circled) ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: (circled) ^{40}Ca mylar ^{48}Ca plastic Trigger: (circled) 4π + HiRA HiRA singles 4π singles	On shift: Sergei Daniela
Comments: Mult 1		

· going back to original beam intensity !
· changing back to mult ≥ 2 on CsI (threshold set to 185 mV)

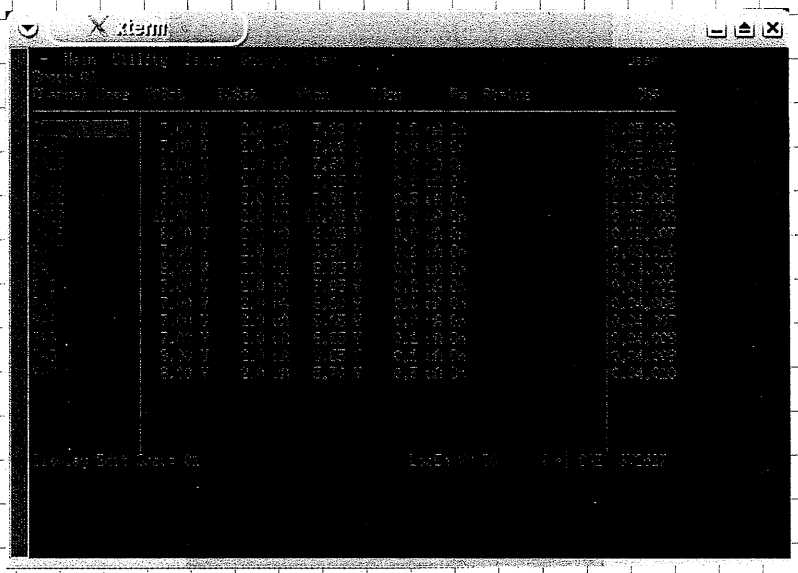
Run# 462	Start : 5:04 Stop:	Date: 11/1 /2006 08
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= 80MeV	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA CsI mult 2 HiRA singles + LaB 4π singles	**On shift:** Sergei Daniela readout cha
Comments: continuation of data taking mult = 2		

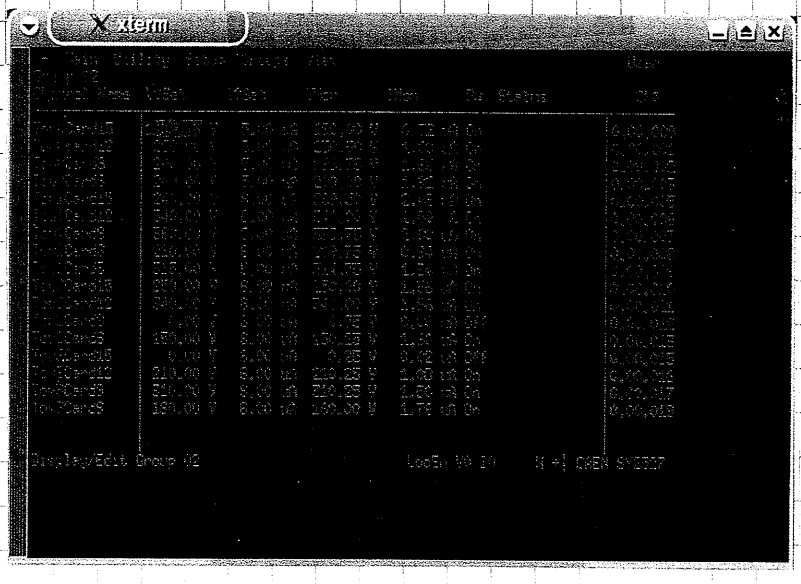


run 459

Run# 463	Start : 05:19 Stop: 06:13	Date:11/28/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	**Target:** ^{40}Ca mylar ^{48}Ca plastic **Trigger:** 4π + HiRA HiRA singles 4π singles	**On shift:** Sergei Daniela
Comments: mult=2		

11/28/06 5:25





Run# 464	Start : 06:13 Stop:	Date:11/17/2006 28
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A=80MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift: Sergei Daniela
Comments: continuation of data taking mult. =2		

6:45 note: RUNS 4TI-464 no pulser in E_f – probably mistake in cabling in the vault

at 2:00 We stop beam of ^{40}Ca.

Run# 465	Start : Stop:	Date:11/17/2006
Beam: • ^{40}Ca • ^{48}Ca • p • alpha source E/A= MeV	Target: ^{40}Ca mylar ^{48}Ca plastic Trigger: 4π + HiRA HiRA singles 4π singles	On shift:
Comments: Continuation of data taking		

Run 466 Pulser Run

Run 467 Pulser run
E_f 0-10V / 20s 51 steps / readout crashed

Run 468 pulser run
E_f 0-10V / 20, 51 steps lower

Run 469 crashed

Run 470 crashed

Run 471 0-10v, 20s 51steps Tower

472 Thresholds on Tower 3 epi changed from 101 to 999

Run 473 T3 fine pulser EF 0-10V, 20s 51step

474 T3 fine pulser, EB 0-10 V,

20s, 51 steps,

list of problems

11/24/06

- module 2A dE stopped working on 11/23 evening - cable connections checked, O.K. - no problem found
  ? bad QDC ?

- no time spectra for Ball modules:
  - FIXED:
    - ~~27A~~ ~~no scaler~~ } no output from ECL con.?
    - ~~25A~~ ~~no scaler~~
    - ~~27D~~
  - ~~27E~~ ~~no scaler~~
  - 14 E no scaler - whole module dead

Run 475 : T2 fine pulser run

EB 0-10V 20s, 51 steps

Run 476 T1 EB

477?

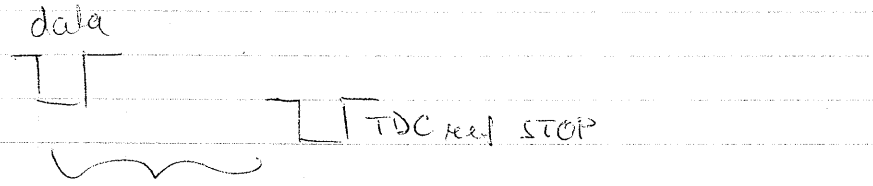
Run 478 T0 EB

Went to try to pulse the dB al was not successful. We saw nothing coming in. ⇒ perhaps there is too much noise

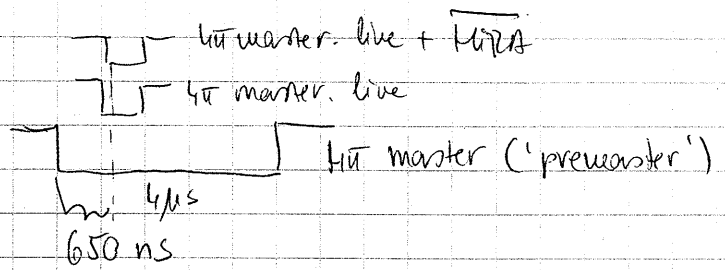
However, we did see problems on E_B while pulsing DE. This means that there can be a noise pulse generated on the chipboard while running the pulser.

Moreover, we found that the pulser ramp on motherboard for Tower 1 is odd on the odd channels. We do not ~~s~~get anything through at low amplitude. Can we believe the zero? - I don't ~~thing~~ think so. We also see the pulse becoming more noisy as we go to larger strip numbers - this only occurs one side of the chip. We also see some noise coming in on the board. The value look strange. ~~I no~~ Ill increase as one ~~goes from left~~ goes to ~~increasing~~ increasing strip #.

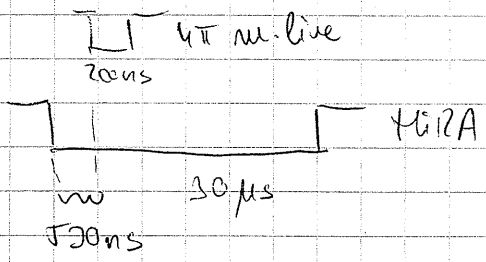
HiRA + 4π coincidences
- timing with beam



4π fast circuit - timing



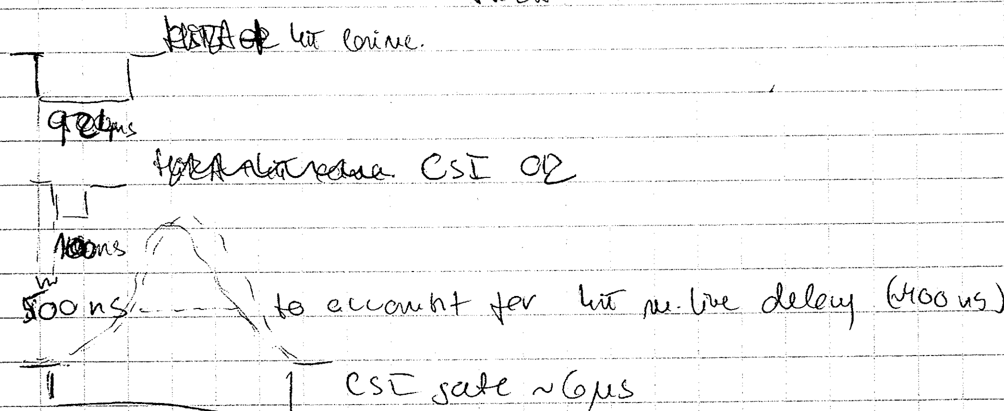
4π + HiRA coinc.



misc. V1190 TDC - slot 16

ch	Inpact
1	RF
2	OR Ef
3	OR Eb
4	OR dE
5	OR CsI
6	4π Master
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	

CsI gate - HiRA singles
HiRA + 4π

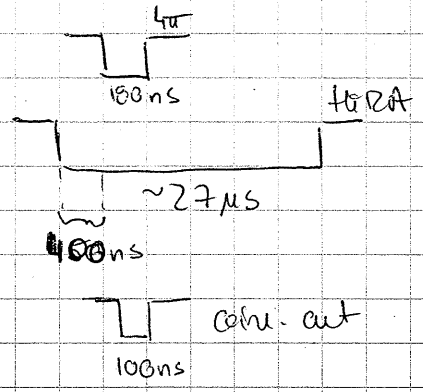


HiRA scaler – slot 2, 0x120000

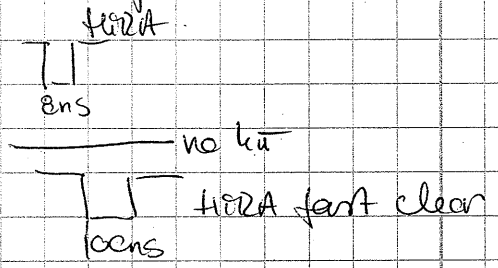
ch	input
1	HiRA + 4π coinc.
2	4π fast clear
3	HiRA fast clear
4	OR CsI
5	OR E_f (OR A)
6	OR E_b (OR B)
7	OR dE (OR C)
8	mult CsI
9	mult E_f
10	mult E_b
11	mult dE
12	
13	
14	
15	

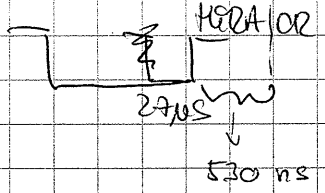
HiRA + 4π timing

HiRA + 4π coinc.

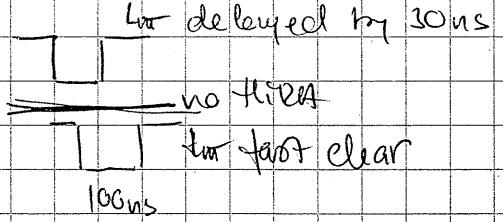


HiRA fast clear





4π fast clear



OCT