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0749. 27/5/2011

... RUN S1287 Continuing ...

0749 RUN 151 started.

ECL/TDC cable GB was missing replaced it.

This will affect TDC values from the energy change onwards (RUN116)

08:43.04. RUN 151 stopped.

08:43.34 RUN 152 started.

Sorting run 151 to check....

11:00 Total trigger rate upto ~15000.

Put Ask Rates FC0 to num in go back to were upto ~120epA. -200epA.

0	2400	S2-1	15.83
1	4000	S2-2	4.7
8	2500	PD	0.7
9	7100		
10	3600	pressure	250.54 / Top
11	73000		
12	1200		
13	3000		
14	2500		
15	6600		
18	2700		

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Run 152 Stopped 11:32:20 160567 clicks

Run ~~153~~ 153 started 11:33:28

Dead time! - restart

Stopped

Run 154 - phantom

Run 155 started 11:41:21

Beam fluctuating a bit. - will try and keep an eye on rates.

08 quick run enough.  
PreAmp Temp = 17°C  
Cooler " = 9.2°C  
Gas Temp = 27°C  
Pressure = 250.79 Torr

Scalers 0 Trig = 7500  
1 = 4100  
9 = 654  
11 = 644  
18 = 2200  
FCO Leakage = 120 epA.  
S2-1 16.4 μA  
S2-2 3.8 μA  
PD 0.6 μA.

All S2-1 and S2-2 present.

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14:40 Stopped run → increase current from 70 epA to 100 epA

14:41 start run 156  
Scaler 0 ~ 6300

→ detected triggers low stop & start again.

14:43 start run 157  
scalers: ~~0~~ 0 = 6600  
1 = 3700

S2-1 leakage gone up to 17.31 μA, so I've set I<sub>0</sub> to 25 μA. Unfortunately I only know how to do that for all channels at once not individual channels.

15:45 Rates look a little high - stop for cups read  
Run stopped 15:40:42 blocks 55521

FCO 120 epA

Run 158 started 15:45:31

scalers 0 - 7500 pressure 251.526 Torr  
1 - 3700  
8 - 2500 S2-1 17.60  
9 - 65000 S2-2 3.83  
10 - 2700 PD 0.9  
11 - 65000  
12 - 1500  
13 - 2900  
14 - 2100  
15 - 5500  
18 - 2300

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158 STOPPED 17:10

159 START 17:15

Quick RUN Pulsar WALK → STOPPED Triggers problem

160 START 17:20

161 START 17:25 STOPPED 17:35

162 START 17:40

163 ✓

164 STOPPED

165 ✓

FCO 125 ePA

166 STARTed 18:05  
STOPPED Problems with scalars

167

0	7477	11	68209
1	3848	12	1509
2	1098	13	2841
3	1012	18	2288
8	2244		
9	61905		
10	2796		

Temperatures  
 GAS 26°C  
 PROMPS 19°C  
 Cooler 10°C

SZ-1 18.41 PA  
 SZ-2 3.89 PA

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Target P 252.26

CG4 0.002

RUN 168 STARTED 20:05

0	9	SZ-1	19.26
1	10	SZ-2	3.93
2	11		
3	12		
8	13		
	18		

BAD SCALARS

RUN 169 STARTED 20:07 BAD SCALARS

RUN 170 STARTED 20:08 FCO 150 cPA

0	9876	10	3844
1	4335	11	95381
2	998	12	2009
3	1017	13	3818
8	3251	18	2696
9	87834		

STOPPED 22:05

gas pressure 252.015  
 CG4 0.002

SZ-1 19.89  
 SZ-2 3.81

RUN 171 STARTED 22:10

FCO 120 PA

0	7924	10	3164
1	4278	11	74042
2	1006	12	1815
3	1026	13	3418
8	2716	18	2392
9	68804	18	2463

TEMP  
 Cooler 9.7°C  
 Pressure 15°C  
 GAS 24°C

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28.05.2011 0:15 checked FCO current dropped to about 85 epA operator traced that to stripping foil, changing it now.

0:45 72 epA, but could increase as coating burns off opened slits by .1 mm  $\Rightarrow$  105 epA

run 173 started 0:48 FCO 105 epA

0	8313	10	3213
1	4371	11	70657
2	1000	12	1803
3	1016	13	3320
8	3015	18	2416
9	73299		

stopped at 1:19 as scaler 0 went up to 12000

run 174 started 1:23 FCO 100 epA

0	6722	10	2690
1	3935	11	58887
2	1001	12	1544
3	1015	13	2931
8	2237	18	2143
9	54073		

stopped 3:40

FCO reads ~ 70 epA  $\Rightarrow$  opened slits to 100 epA

run 175 empty

run 176 started 3:46

0	5435	10	2210
1	3323	11	47430
2	1019	12	1150
3	1038	13	2256
8	1891	18	1623
9	46008		

stopped 5:50 FCO 55 epA

run 177 started 5:53 FCO 100 epA after opening slits further

0	6368	10	2689
1	3630	11	56424
2	1075	12	1488
3	1095	13	2842
8	2285	18	2058
9	52984		

stopped 7:39

Forgot about saving and clearing spectra, so 171-177 are summed

MAB/JB END OF MAIN RUN.

Checking:

Preamp	17/18 °C
Gas	21 °C
Pressure	251.3 Torr
Leakage 52-1	19.6 $\mu$ A
Leakage 82-2	3.3 $\mu$ A

Run PLAN FOR SAT 28<sup>th</sup>

- 1) Reduce beam, PD2 run at 250 Torr
- 2) Pump to 50 Torr
- 3) PD2 run at 50 Torr
- 4) Take PD out, full <sup>beam</sup> run at 50 Torr (~2 hours)
- 5) Pump down (roughing)
- 6) PD2 run, no gas
- 7) Complete venting
- 8) Open chamber, window off, sources in
- 9) Pump on turbo
- 10)  $\alpha$ -calibration run.
- 11) pulser walkthrough
- 12) open chamber
- 13) dismount detectors and re-entrant flange.

STEP ①

Attenuator in, PD2 in running  
at full gas pressure (250 Torr).

Start	RUN 178	07:53:17	~ 70 Hz
Stop	RUN 178	07:55:57	

spectra ok

STEP ②

Pumped to 50 Torr ok.  
He Amp, Bias + Cooler on  
Cooler set to 7°C

STEP ③

PRESSURE 49.08 Torr  
RUNNING with PD2 spectra ok.

0834

RUN 179 started	08:34:41
RUN 179 stopped	08:37:59.

(peak width)

STEP ④

115 epA.

Triggers 5100

coincidences:

Trigger	~500
PD1	~1600
S2-2	~3400

No target,  
S  $\phi$  collimator.  
50 Torr run.  
taking data.

(S2-1 : ~21,000)

Start + Stop RUN 180 (dud run).

Start RUN 181 08:51:16

Scalars

- 0 5000
- 1 3000
- 8 1000
- 9 20000
- 10 1000
- 11 21000
- 12 650
- 13 2500
- 14 1000
- 15 3000
- 18 2500

Pressure 49.08 T

Precamp 15°C.

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- clear peaks visible at low energy in S2-1 front adc 1. 16-31
- less clear in adc2. 0-7
- very few counts in adc 2.8-15 - shadowing?
- structure in S2-1 back extends up to ch ~ 3500. Think this is higher than previous, which would make sense for lower pressure
- peaks in adc3. 16-31
- huge low energy spikes in adc4. 0-15, but peaks visible too
- big peak (at low energy) in PD0 - noise (?)
- #1 tdc 32-47 have 2 distinct peaks, strongest in 36-42, i.e. inner most strips of S2-1
- #1 tdc 80-95 (i.e. S2-2 I think) - lots of structure
- #2 tdc 81 (-PD 1, I think) has multiple peaks? - only one in #2 tdc 84 (PD 4)

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9:45 Bender Tripped - being reset so no beam for a few minutes.  
 Stopped run 81 @ 09:45:28 JSD 251 blocker written.

9:48 Beam back } Keep same incrementing spectra.

Run 182 - dead time - restart

Run 183 started 09:48:58

leak gas	S2-1	12.11	pressure	4.084 Torr
	S2-2	5.04		
	PI	0.93		

FCO	120 pA	Scaler	0	4200
			1	2680

Run 183 stopped 10:50:06. Spectra saved  
 STEP (5) 10:49: Pumping out rest of H<sub>2</sub>. Cleared.  
 (this is 182 & 183)

STEP (6) PD2 run with no gas. (with window)

11:28 H<sub>2</sub> pumped out of chamber & H<sub>2</sub> line.  
 Pressure PD in.

Noted that noise we saw before last H<sub>2</sub> fill came back. Think it is the turbo, switched off before starting run.

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Started run 184 11:32:54

no gas beam onto PDZ.  
cooler at 5.5°C setpoint

stopped 11:32:8 82 blocks spectra saved & cleared.

op 6A - extra step at Sam's request

Doing extra run without 5mm collimator  
(no gas no PD) to see if it makes  
scattered beam better or worse.

Will attenuate beam first to be safe.

Back to 100 epA.

Start Run 185 11:48:19.

Scalars.	0	7000
	1	3500
	8	500
	9	14000
	10	700
	11	14000
	12	600
	13	4500
	14	1000
	15	5000
	18	2300

leakages	S2-1	20.99	- This is high, but dropping.
	S2-2	9.8	
	PD	0.97	

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Spectra: - peaks still present in #3. adc 16-31  
(ie S2-2 inner strips)

Run stopped 12:07:10 15881 blocks written.

spectra saved & cleared.

\* 1209. Beam given back to operators 1209  
END BEAM.

1215: step 7 venting / flushing procedure.

13:57: procedure completed successfully.

Steps 8+9 H<sub>2</sub> fill line back filled with N<sub>2</sub> (~700 Torr)  
to blue panel.

Chamber swiped - OK, opened, target ladders &  
FC out. Ni window out.  
Alpha sources mounted in front of S2s.

Step 10 R 06532 on back of S2-1  
plate - looking at S2-2 mounting

R 06708 on target ladder 2, looking at S2-2.

Target ladder position ~centrally by eye.

Chamber closed and pumping.

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(change trigger to 5; OR.

Run 186 started 15:59:55

leakages	S2-1	20.55
	S2-2	7.07
	P1	0.7

inner strips of S2-1 looking pretty shot, others OK.

inner strips of S2-2 somewhat degraded also - see log for screenshots

✓ - run completed.

Run 186 stopped.  
18.09.49.

} → saved as run 187 by accident!

II) Pulser Walkthrough

Run 187 Junk!

Run 188 18:19:26, Stop 18:24:00 S2-1 - Front +ve input no att.

Run 189 26:33 Stop 18:33:17 S2-2 Front +ve input x 5 att.

Run 190 :34:14 Stop 18:40:16 S2-1 - Back -ve input x 2 att.

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Start Run 191 18:41:11 Stop 18:44:40 S2-2 back -ve input x 5 att.

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Run #	Date	Start	Stop	Beam	Beam Energy (MeV)	Target (pressure)	FC0 (epA)	Triggers	Triggers Accepted	Blocks	Comments
143	26/5	23:38:38	23:37:46	<sup>24</sup> Ne <sup>3+</sup>	3.98 MeV						Trigger Job-up
144	28/5	23:40:17	01:40:30	"	"	250.5	100	6500	3800		
145	27/5	01:45:51	03:42:40	"	"	250.5	100	6300	3700		
146	"	03:57:32	05:50:24	"	"	250.7	65				
147	"	05:54:12	06:15:35	"	"	250.5	100	6560	3960		
148	"										Trigger setting up.
149	"	16:43:36	07:10:09	"	"	250.5	60				
150	"	07:13:11	07:41:51	"	"	250.305	105	6300	3800		
151	"	07:49:07	08:43:04	"	"		105	6200	3800		
152	"	08:43:36	11:32:20	"	"	250.540	~170	9400	4000		beam drifted up to 220° ept
153	"										Coop
154	"										Coop
155	"	11:41:24					~120				
158	"	15:45	17:10	"	"	251.526	120	7500	3700		
159	"										
160											
161											
162											
163											
164											
165											
166											
167	"	18:05	20:00	"	"	252.26	125	7477	3848		
168											
169											
170	"	20:07	22:05	"	"	252.01	150	9876	4335		
171	"	22:10	00:11	"	"	252.02	120	7924	4278		
172	28/05	01:47					105				
173	"	01:48	1:12	"	"	251.53	105	6871	4521		Turnk
174	"	1:23	3:40	"	"	251.53	100	6722	3935		
175											
176	"	3:46	5:50	"	"		100	5266	3169		target coop reading
177	"	5:53	7:39	"	"	251.28	100	6368	3670		
178	"	07:58:17	07:53:57	"	"	"	att.	70	70		PD run

~~S2-1 Front Back~~  
 S2-1 Front  
 S2-2 Front  
 S2-1 Back  
 S2-2 Back

Run #	Date	Start	Stop	Beam	Beam Energy (MeV)	Target (pressure)	FC0 (epA)	Triggers	Triggers Accepted	Blocks	Comments
179	28/05	08:30:44	08:37:51	$^{20}\text{Ne}^{5+}$	5.98 MeV/u	49.08	115	70	70		PD run @ low pressure
180											
181	28/05	08:51:16	09:45:28	"	"	49.08	115	3000	3000		Low pressure
182											
183	28/05	10:45:58	10:50:06	"	"	49.08	120	4700	2680		Low pressure run
184	"	11:32:54	11:39:08	"	"						PD run - no gas
185	"	11:48:17	12:07:10	"	"		100				change 5mm coll. to 10mm
186	"	15:57:37	18:07:47								d calibration
187											
188		18:10:26	18:24:00								} Pulsor walk-through
189		18:26:33	18:33:17								
190		18:34:14	18:40:16								
191		18:44:11	18:44:40								
<u>END of Experiment.</u>											