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Decided beam ~~was~~ is ok for overnight, we may want to treat it in the morning before running with gas.
Bob left.

FCO in
Will ramp up biases and match preamp temp.

~~3mm collimator~~

Preamps at 15/16°C

S2-1, S2-2 & PD biases on.

preamps	16°C	S2-1	120.32	0.66
		S2-2	110.2	0.04
		W	off	0
		PD	30	1.02

Must have been an anomalous reading.

Camera power unplugged.
Put PD #2 in, put 0.5 mm lower than setting.

S2-2	back	scaler reading	~600	?
	front	scalers reading	0	.

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1:25 FCO 1.2 nA (with x10 attn in).

10% transmission through 3mm collimator.

4.44 MeV/n

~ 400 pps in Ops 5: det.

Didn't zero spectr. Run #34 is junk.

PD scalers reading ~500.

Lots of noise in PD #1

PD #2 seeing beam, in channel ~ ~~1895~~ 1895

Run #35 Started 01:39:52

Stopped 01:43:34

1:48 bias off, preamps off cooler set to 20°C.

Cryo off, turbo off.

2:07 Cooler off.

Vent.

Ops opened chamber & wiped - OK.

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15 removed S2-1 shield & S2-2 shield
 Re checked camera and everything. Re connected Pump.
 redrew 3mm coll. spot. and closed up.

17 Turbo On.

5 Cryo On

45 Cooler on set to 5.5 °C

00 Preamps on S2-1, S2-2 & PU biased

	V	I
S2-1	120.32	0.79
S2-2	110.2	0.28
PU	30.0	1.02

Cooler 5.5 °C
Preamps 14 °C

Target ladder #1 set to 24.25 - 5mm collimator, shifted down by 0.5mm

Target ladder #2 set to 101 - Fluor Au shifted down by 0.5mm

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5.40 ~ 500Hz into TUDA. No rate on S2-1 but ~ 2k on S2-2. Not beam dependent. Tried to find noise source. Rate seems to be in S2-2 ~~front high channels~~ front high channels. Simon noticed leakage current reading 0.25 nA. Should be ~ 1.6 nA !!!

Scan through logbook shows zero leakage current initially suggesting S2-2 not connected properly.

5.55 17 epA on FCφ => 27 epA on TUDAFPC. (due to charge state change)

Beam into TUDA. Rate (on S2-1) ~ 3.5k.

Locked at S2-1 spectra. - C/Au peaks too high in energy

Mid-session restarted in 'TUDA'

Beam energy 4.44 MeV/u => 93.24 MeV

changing target to CH2

6.10 ISAC-II vacuum problems - waiting for beam.

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Beam Back, the vacuum problems were, it seems, gauge problems.

Further factor of ~200 attenuator in... ie 20 eppA on FCO. (divided by 200)

Run 37 Start 08:22:14 5780 blocks. Stop 08:55:29

S2-1 looks 'ok' S2-2 seems to have signals from unloads in the odd # spokes Changing bias on S2-2 during this run!

Run 38 Start 08:58:13. Stop 09:03:33 22 blocks.

v. low looks like tape server dice? Read time was v. high.

Re-started Tape server

Changed to: 10 mm collimator on target ladder to ensure that the data we are seeing is target-related and not direct beam.

10 mm hole in; check whether beam is clipping frame.

Run 39 Start 09:23:57. 20.2 pA Stop 09:33:12 18 blocks

Run 40 blank target 10 mm hole FCO 5 pA 2(Ne51) => 6.6 x 10^6 pps stop 09:47:25 4.3 pA on TUDAFCC

Acquired rate dropped again. Tape Server?

Run 41 trying again... Start 09:50:07 Stop 09:54:12

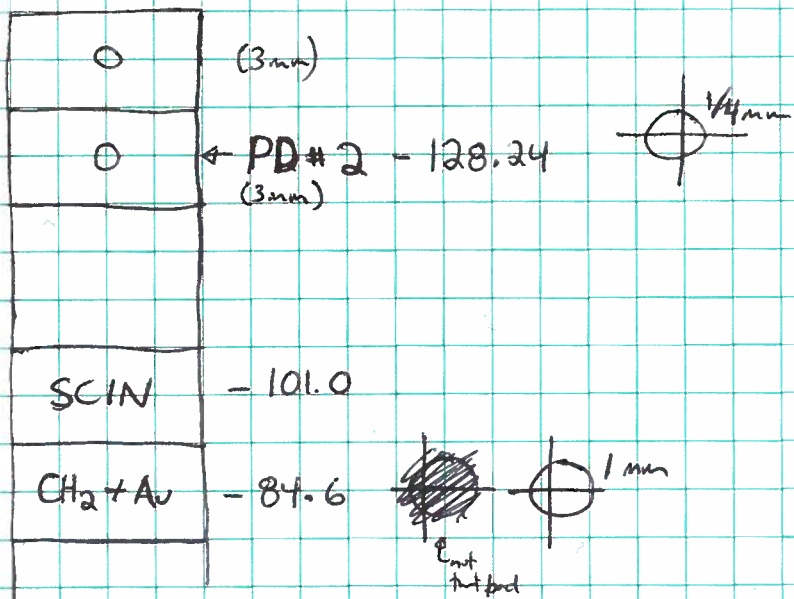
Run 42 Changed to Nat C target, attenuator (1,3,4 in ~250,4 att), FCO < 1 pA Start 10:05:53 stop 10:15:20 755 blocks

Wanted to be ready for Hz.

Opened TUDA. Swipe test OK.

Checked S2-2 cabling. Cable at S2 end not seated properly. Cabling at preamp seems OK.

12:50 Aligned target ladder with telescope (see next page)



TGT #3 (max into position from the top down)

DAFC aligned ok window 2C installed. used op reset ladders on.

checked noise with preamps on and S2-2 biased to 110V. 20 Hz. All in S2-2 back (0-7). Threshold used to 15 mV. ~ 0 Hz.

00 Started pumping

00 Turbo & cryo on.

= Detector bias camera - 142.90.127.102/view/view.shtml

~~to~~ Cooler on. 5mm ϕ or TL#1 and scintillator on TL#3 (previously TL#2)

Beam spot 4 was a little elliptical and is the left but prob. ok. Will put photo on log.

17:51 Put PO2 in, ~~removed~~ got ops to check shift in a little.

Got ~300 Hz on top of ~1500 noise.

Discriminator threshold for S2-2 set to 20 mV 1.6 kHz rate noise reduced to ~600? CHECK WHEN NO BEAM!

<u>Run 43</u>	Start	18:02:53	
	Stopped	18:04:57	510 blocks

35,000 events

beam on PO2, centroid is 1699 ch

18:05 Faraday cups put in.

Going to check noise before starting H₂ fill procedure.

~ 600 Hz noise. Increased thresholds 25 mV.

~ 120 Hz. Amps 1, 2, 5, 6 out of 8 are at 30 mV.

~ 2 Hz.

Start Hz procedure.

Smooth as clockwork. Pressure to 248 Torr.
Cooler set to 15°C. 5mm coll. on TL #1. 5.5 eptA on FCO
TL #2 out of the way

Run # 44 Started 20:41:54
Stopped 21:02:13
10,101 blocks (sorter sort3 spectra saved).

Run # 45 (REACTION DATA!) Started 21:02:23 17848 blocks.
Stopped 21:37:40

Putting in PD2 into O/S target position.

Beam current scaled back.

Run 46 start 21:54:03 524 blocks. Stop 21:58:50

PD2 centroid ~ 1389

21:22 Target ladder #2 removed to 0.0,
out the way

Target ladder #1 moved down to 24.25 um
5mm collimator + 0.5 mm (ie further into chamber low)

Check if this affects rates / spectra.

22:20 ~ 5 pA on FCO
~ 2784 Hz on trigger

Run 47 Started 22:22:28

Pressure 248.35 Torr in chamber.

22:28 MIDAS gone slow again. Stopped sort.

Trying to stop run.

Closed some windows and stopped run 22:52:5
45 blocks

Runs 48 - 50 are junk.

Started Run 51 22:35:01

Stopped 23:09:32 15529 blocks

saved spectra as run 51.

8 Leakage Currents
 S2-1 1.35
 S2-2 2.30
 PD 0.36

12:46 Noticed lots of noise in S2-1
 many strips

Will move 5mm collimator back ~~and~~
 to a measured position and compare.

TL #1 @ 23.75 nm

FCO 5.5 pA, Preamps @ 21°C
 pressure 248-107 Torr

Run 52 started 23:28:11

trigger rate 22700, accepted 22100

visible above warmer preamps mean noise is creeping
 above threshold.

Will lower set point after have run for a while
 with 5mm coll back in position.

Run 51 not in /home/tada/51287/spectra
 Looks like spectra have been saved to 51204
 instead.

Not sure if these are all ours, or some are
 from that expt.

51207 is ²⁶Al - G. Lotay, don't think this has run.

ie: 24 Mg data taken

23:40
 S2-1 V 120 I 2.15
 S2-2 110 2.28
 PD 30 0.35

Stopped Run 52 @ 23:42:28
 6883 blocks

Leakage current on S2-1 seems to be going
 up. Have ask for a cup to be put in.

Saved spectra to /home/tada/51287/run 52

Comparison of spectra from Run 51 & 52
 look v. similar, hence changing collimator made
 little difference to noise

	run 52	run 52 51	
ad #1 adc 0	3178.5	8398.5	S2-1
#6 adc 4	13658	43608	PD 4

$$\frac{3178.5}{13658} = 0.2327$$

$$\frac{8398.5}{43608} = 0.1906$$

See ~~more~~ ¹⁸⁵⁵ stuff in S2-1 strip relative to PD4 with
 collimator lower than at nominal position.
 This may indicate ^{some} scattered beam so run at nominal
 setting.

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45 22nd May
Cooler set to 10°C about @ 30 min ago.

Preamps now at 17°C

Gas at 24°C

Spectra cleared S2-1 leakage 1.7 nA

Start run 53 @ 00:51:43

FCO 5 pA

triggers ~2919 accepted ~2300

Scalers

8	370
9	2705
10	602
11	2646
12	60
13	100
14	78
15	211
18	92

time	S2-1 leakage
00:54	1.96
00:55	2.00
01:57	2.08
1:12	2.44
1:20	2.57
1:34	2.83

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2:00 S2-1 leakage 3.25
S2-2 1.95
P1 0.33

Rates

0	4153
1	2975
2	285
3	1003
8	405
9	4195
10	646
11	2395
12	69
13	121
14	94
15	247
18	95

Run 53 stopped 02:05:05

2:08 FCO 5.5 pA

Pressure 246.886 Torr

moved TL # 1 to 24.25, 5mm coll down by 0.5 mm.

FCO 5.5 pA

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Run # 54 Started 2:18:22

Rates	0	3301
	1	2425
	5	182
	4	1800
	8	36
	9	5003
	10	690
	11	2415
	12	70
	13	108
	14	86
	15	218
	18	91

2:21 zeroed spectra.

24 S2-1 leakage 3.27 mA

21 3.66 μ A leakage on S2

20 4.00 μ A leakage on S2

To view leakage camera
<http://142.98.127.182/view/view.shtml>
 1 Copper
 7500 for Control Room

4:24 5 e pA on FCO

pressure 246.886 Torr (CM5)

02:19:22 Start

Run 54 stopped at 4:23:39

62636 blocks

(was 510)

** Changed Iset to 8.0 μ A on top 8 detectors on HV unit as believe this may be the trap level in μ A for supply. Currently at 4.0 μ A on S2.

Check this with an expert when they come in

04:40

5.4 e pA on FCO

Q=5

~~Run~~ Pressure 246.886 Torr

Run 55 started 04:41:19

(All MEMSAS, Spectra Cleared)

04:54

Rates

0	3433
1	2530
2	1028
3	1047
8	387
9	3372
10	611
11	2166
12	58
13	93
14	72
15	195
18	57
19	81

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IC	ADC Channels	Detector	Detector Signals	Signal Order (MemSas)
	0-31	S2-1	0-31 (strips)	47, 45, 43, 41, 39, 37, 35,
	0-15	S2-1	32-47 (strips)	16, 18, 20, 22, 24, 26, 28,
	16-31	S2-1	0-15 (sectors)	
	0-31	S2-2	0-31 (strips)	
	0-15	S2-2	32-47 (strips)	
	16-31	S2-2	0-15 (sectors)	

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33, 31, 29, 27, 25, 23, 21, 19, 17, 15, 13, 11, 9, 7, 5, 3, 1, 0, 2, 4, 6, 8, 10, 12, 14

30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63

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15.55. Leakage Current 4.37 on S2-1
 2.07 on S2-2
 creeping up, but slowly
 all spectra checked, ratio ok.
 Pressure of H₂ ok.
 keep going...

Calculating energy of ²¹Ne at target
 "position"

35 Centroid of PDA No gas No window = 1898
 43 " " " " with window = 1699 ←
 46 " " " with gas with window = 1339.

$E_{beam} = 93.24 \text{ MeV} = \text{ch } 1898.$

energy loss in Ni $\times 9.96 \text{ MeV (SRIM)}$
 no gas with window \Rightarrow should be $\frac{(93.24 - 9.96) \times 1898}{93.24} = 1695$ (ok ✓)

\Rightarrow Effective energy at target
 $= \frac{1339}{1898} (93.24) = 65.8 \text{ MeV}$
 (approx).

Checking things downstairs.
 Coder 9.5° goggles on
 Preamps 17°
 Ok ✓

End Run 55.
 Run 55 = 04:41:19
 06:49:56

Spectra saved in run 55
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0653 Run 56 Started 06:53:03

0804 Beam operators say that there
 was accidentally a period (5-10s) of
 high intensity. The 210x attenuator was
 briefly dropped out. Back at FCD = 5s

Stopped 08:18:20

Phantom run 57 - must have hit button twice!

Cup in. Valve closed.

Plan is as overleaf

09:00 Did a set of pulse walkthrus starting at 8:27 to 9:00

- run 58 - S2-1 front
- run 59 - S2-2 front
- run 60 - S2-1 back
- run 62 - S2-2 back

run 61 was short as we had to change the pulse height (factor of 2 off)

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Suggested measurements:

~~1) Pulse~~

1) Pulse walk through

2) H₂ out

3) Put in attenuator and check transmission
(guide to whether we can tune with ~~exp~~ window in)

4) Run with as high an intensity as possible

5) Beam energy change

6) Re-tune

7) Temp of preamps to

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MAB/SF Sun 22/5/11 ^{Start} 09:20

S1287 TUDA hydrogen venting procedure

Please follow step by step and tick off as you go!

1) To make chamber safe

- Ask Ops to close IV4
- Turn off detector biases
- Turn off pre-amps
- Change cooler set-point to 20°C — wait... then turn off.
- Change trip point on Baratron control box to 800Torr

2) To remove hydrogen

- slowly open H₂ fill valve on top of TUDA (pressure on CM5 should come up to ~360Torr) (don't race)
- Close hand valve on roughing line
- Open RV5
- Slowly open hand valve on roughing line (~1Torr/s)
- Once CM5 < 1Torr, reconnect cables to gauges CG5, CG5A, B and C, and PNG5
- Once CG5 < 250mTorr, open RV4 (not when pumping out to run in "vacuum")
- Replace TUDA end flange bolts

3) Flush chamber with nitrogen and back fill H₂ line

- Close RV5
- Check hand valve on vent line is closed and vent line is attached to nitrogen bottle
- Open nitrogen bottle and flow valve (a little)
- Open VV5
- Slowly open hand valve on vent line (~1Torr/s)
- Fill until CM5 reads ~700Torr (do not overpressure)
- Close VV5 and hand valve
- Close H₂ supply valve on top of TUDA
- Close nitrogen bottle and flow valve

Hydrogen supply line is now back filled to blue panel with nitrogen.

4) To clear hydrogen from exhaust line

- Open RV5
- Slowly open roughing line hand valve (~1Torr/s)
- Pump out until CG5 < 250mTorr
- Close RV5
- Close roughing line hand valve

Chamber is now safe, and can be left in this state.

5) To vent to nitrogen and open

- Open nitrogen bottle and flow valve
- Open VV5
- slowly open hand valve on vent line (~1Torr/s)
- Fill until CM5 reads ~760Torr (atmospheric pressure)
- Close nitrogen bottle and flow valve
- Inform Ops you would like to open the chamber and ask to perform swipe test.

Wit

24 2011 The Rapture never happened...

10:22:13 Run 63 started, Stop at

Triggers: 2945 Accepted 48. T/S crashed?

Same attenuators as for reaction data. ~ 6 sept.!

(Gas out, nothing in tgt position, so test of rate from Ni foil).

Cooler set to 5.5°

[We followed procedure for venting as overleaf, to get in state where we can take beam on empty chamber.

Issues with this procedure:

- 1) RV5 with trip closed, as Tuda gets < 0.1 Torr
- 2) It was quite hard to get 1V4 open and Arayin open.

→ With beam on, we got ~ 1200 kHz downstream on higher box.

He call to T.D. He remote killed Midas. 10:34 am

ated vme. Seems to have helped.

o has come in to do energy change. Checking with TD, solving w/ DAA problem "is not a 5 min job". So asked Marco to proceed with energy change. Success, no Ni-foil (no gas) data at 4.44 MeV, but be helped.

11 am checked cooler temp.

Cooler 5.5°

Gas 25°

preamps 17°

Attenuator info for this test.

Checked to see if position of 5 mm φ collimator could be changed to improve transmission

Started at 24.25 mm. Rate 100	
23.75	120
24.50	120

Returned to 24.25, rate 100 Hz. Looks optimized.

13:00. 17 epA on FCφ → rate 4 kHz. Will no gas, not tgt, only Ni foil

Before we had ~ 3 kHz with 5 sept, but with gas in, and then we thought maybe 1/3 was from Ni foil

→ ~ 1 kHz from 5 sept from foil before.

So, consistent.

Check: 411 MeV/u, 5⁺ charge state ↓

13:42 Run 64 Going @ 13:42:12 triggers: 3904 accepted: 2170 17 epA 5⁺ 21 Ne Ni foil only. No gas

Events are coming in but nothing is showing up in the spectra...

13:49:33 Run 65 triggers: 4070 accepted: 2200 PD: 378

↳ 3500 blocks

13:57:11 → stopped

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66 No gas run.

Start: 14:43:49

Stop: 14:53:15

3150 blocks

9. PD2 in.

cooler temp = 5.1°C
preamp T = 16°C.

67 PD2 Run

Start: 15:24:

Stop:

Peak in PD2 in 1550

(= 76.1 MeV
according to
MAB calc)

Leakages S2.1 4.68 μA
2 2.46 μA
PDs 0.33 μA

15:40 Start getting chamber ready to introduce H₂

Bias off.
Preamps off
Cooler T_{sp} → 15°C

5:50 Change of plan. Pump down to turbo pressure to see if low energy features in R66 are from the residual gas (P_{rms} ~ 0.9 T by end of R66)

5:55 Cooler on T_{sp} → 5.5°C

15:10 Preamps on
Bias on
Leakages 5.05/2.42/0.31

$P_{NGS} = 4.2 \times 10^{-5} \text{ T}$

Later Note
BRF 04:06 23/5
on phone to MAB
Fornisept say trigger
rate of 3000 ~~ms~~, most
was in S1

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16.07

16.08.00 Started Run 68,
16.19.20 Stopped "

Answer - seemed to make no difference
so that peaks we saw in run 66
were not gas related.

17:10 Re filled chamber to 250-061 Torr
(with H₂ flush of full vent cycles)

Put TL #2 to PD position.

Ask for few handed counts /s.

Ops say about 250 cps

Take FCO

Start run 69 @ 17:15:34 PD2 centrai
@ ch. 1153
~ 36 events/s.

Stop @ 17:16:44

17:18 PD2 taken out.

→ Spectrum saved to
PD2 - 2011 May 22 - 17:20.30

Preamp @ 16°C

Gas @ 25°C.

17:30 15 ePA 21 NeIT on FCO. Trigs ~~3~~ k

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Run 70 Started 17:32:32
 Stopped 17:39:41 6321 blocks
 Saved spectra

Note: Data on toda3 stored in /net/toda2/data2/data/S1287

10/28 These holds on RAL amplifiers increased to

1	11.2	} J2-1 Front
2	11.5	
3	11.0	
4	11.3	
5	11.2	
6	11.1	} J2-1 Back
7	11.2	
8	11.5	

FC 0 14 epA
 Rate ~7000/s

Run 71 started 18:12:47
 Stopped 18:33:33 blocks 16652
 Spectra saved, accepted triggers ~4000

Going to increase thresholds to 15 mV and look again

log onto toda2 cd /midas/tape server /SIN05
 To start tape server: /master

On processor & press rst

Reboot toda2

summary with data Acquisition

To do

populate run log

Sort at end of each run + old unsorted runs

take FCO readings at start and end of runs

back up Actc

check space on disk

make run plan if estimate when beam energy changes are ok.

Compare last night's runs after done with no window to today's after done, without gas.

18:52 S2-1 thresholds raised to 15mV
S2-2 " " to 50mV

~~FCO~~ ~~13-14 ept~~

between 13 & 14 ept on FCO

Run #2 started 18:54:57

triggers accepted 7371
4125

18:57 spectra zeroed. gas 16°C
24 - 25°C

pressure 250-061 Torr

19:50 Run stopped @ 19:3:39 FCO 13-14 ept

spectra saved, 31780 blocks

Threshold increases don't seem to be affecting rates.

Looking at #1, ade 24 spectra from runs 7071 & 72
shape of spectrum seems to be changing slightly.
Peaks at ~chn 380 seem to shift up as
thresholds are increased. Very strange!

19:35 S2-1 4.4 nA
S2-2 3.12 nA
PO 0.35 nA
pressure 250-061 Torr

gas 22°C cooler 10°C
pre amp 17°C

Increased S2-1 leakage current to 20mV

~~FCO~~ FCO ~~16 epA~~ 16 epA

Run 73 started 19:52:09

trig. 8657 stopped 20:20:31
acc. 4368

Saved spectra.

att. Reason suggests may be a saturation issue.
Asked for x5 less beam to see if shape of
spectrum change.

CO 3 epA
Started run 74 20:33:18

Spectrum seem unchanged. Deadtime is much better
trig. 1300
acc. 1200

Stop 20:48:02 blocks 4180

73 beam scaled back up.

forgot to save spectra

Change all S2-1 thresholds to 40mV whilst beam
in, rate seemed to come down from ~7000
to ~6500.

Will take data & have a look.

Run 75 started 21:09:52
stopped 22:19:34 60349 blocks

saved + zeroed Men-Sas spectra

run 76 started 22:28:15
stopped 00:20:45 - 109939 blocks

22:22 Increasing thresholds on S2-1 doesn't seem to
be reducing rate. Large 'noise' peak at low
channel number is unchanged. Smaller bump at ~~low~~ channel
~380 moves up (ch2 number), however.

Conclude that this stuff is background (of some sort)
not in coincidence with S2-2, whereas large
peak is in coincidence. Whether this is real reactions
or something else is not clear.

Either way we can't increase the beam by
factor of ten as planned without increasing total
trigger rate, and dead time.

Note, in energy-energy spectrum (4e200) ~~for~~ for
sorted data, most events are along narrow strip
at bottom, presumably low channels in S2-1. This is
consistent with the above, i.e. this stuff is
coincidences.

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May 23rd May

5 Leakage
S2-1 5.40
S2-2 2.86
PO 1.35

pressure 249.573 Torr

FCO = 15 pA

run 77 started 00:32:38

Stopped 01:05:14 26853 blocks.

FCO 14 pA

Run 78 started 01:10:09 Stop 03:05

Gas pressure 249.328 (cmHg)

Leakage S2-1 5.40 μ A
S2-2 2.86 μ A

Scalers	0	8
0	8165	158
1	3692	5436
2	995	184
3	1012	4706
4		165
5		13
6		14
7		15

Temps Preamp 16.0
Gas 23.0
Cooler 10.0

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Actions \rightarrow Save
Sortsas
Select all
Connect to 1287
Add run 73 - sortsa -
Save

Disc info from sort control frame
Select + remove one just sorted
Browse + select run
Add to get selected
Save + quit
Start

~~Sort~~ Runs Sorted. (using sort3) during overnight shift

Run 73	✓	Finished	
Run 74	✓	Finished	01:58
Run 75	✓	Start	02:37 03:05
Run 76	✓	Start	03:15 Stop 03:59
Run 77	✓	Start	06:53 Stop 07:27
Run 78	✓	Start	07:54 Stop 08:28
Run 79			
Run 80	✓	Start	? Stop 06:31

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Date

Message ID: 29 Entry time: Mon May 23 02:12:14 2011

Author: Brian

Type: Routine

Category: Start of Run summary

Handover from last shift was...

1. Running at 4.11 MeV/u at about 15enA (5+)
2. Would like to take more beam but already at situation where deadtime about 50%. They have been raising thresholds on the inner strips of S2-1 to try and cure that, but it doesn't appear to have helped.
3. There is a sort of the past runs ongoing to use the counts in spectrum 4200 (coincidences) to estimate when there is enough data at this energy to move to the next.

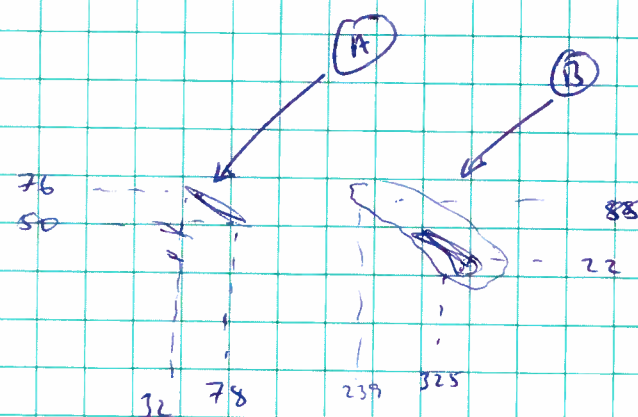
Analysis:

Firstly, the locus being looked at in the S2-1 vs S2-2 to make this judgement cant be right. There are already thousands of counts in this in a replay of a one hour run Jamie's estimates in the run proposal were for 1,000 in 12 hours at $10^{**}8/s$. We are currently at 20% of that beam intensity and the deadtime is about 50%, so should be seeing 10 counts in one hour. The data must be somewhere else in the plot. My guess is that the intense locus is elastic/inelastic scattering coincidences. If this is the case then it maybe we have an issue in that these may be what is dominating the rate and it will not be possible to get rid of them from the trigger.

Looking at the S2-1 energy spectra, it looks like the raised threshold is cutting into potential data (maybe Alex who knows from the MC what energy the data extends down to should look at this and check). The high trigger rate must be from another channel.

Actions for this shift

1. With two people on shift and a requirement that we need two down in the area at all times, I don't think chasing thresholds is viable. This will have to be left to the day shift.
2. Should continue the sorts so that we have the spectra available to make rate estimates once we know what we are looking for.
3. Should look at the sort code to see what calibrations are being used and so determine where on the coincidence spectrum the data should lie.



Tom says dispersions 80keV/cmm

so A runs 6.0/2.56 to 4.0/6.24

Alex MC runs 18.0/15.0 to 7.0/34.0

~~4.0/2.56~~ NB Not sure same way

so cant be this

B runs 6.8/19.1 to 1.76/26.0

RUN 79 STARTED 03:12 STOP 03:53

GAS PRESSURE 249.328 T

Leakage current	S2-1	S2-2	SCALERS		
5.4 μ A		2.86 μ A	0	6235	8 158
			1	3800	9 5537
			2	997	10 184
			3	1004	11 4822
					12 174
					13 247
					14 170
					15 546

Tom emailed to note there is a problem with the TDC settings, a legacy from the computer crash + DAC reset yesterday. It seems the data will be OK, but needs a different sorting approach.

Stopping to make the changes he indicates (see email copied on next page)

From: Brian Fulton <brian.fulton@york.ac.uk>
 Subject: **Fwd: MIDAS DAQ**
 Date: May 23, 2011 4:00:42 AM PDT
 To: rojas@triumf.ca

Begin forwarded message:

From: Thomas Davinson <td@ph.ed.ac.uk>
 Date: 23 May 2011 11:37:50 GMT+01:00
 To: Brian Fulton <brian.fulton@york.ac.uk>
 Cc: "James R. Brown" <james.brown@york.ac.uk>, "Laird, Alison -- Alison Laird" <alison.laird@york.ac.uk>, Simon Fox <simon.fox@york.ac.uk>, "Alexander S. Murphy" <amurphy@ph.ed.ac.uk>
 Subject: **Re: MIDAS DAQ**

Halt DAQ
 Save spectra (if required)
 Select Experiment Control -> Advanced -> System Configuration/Test/Debug
 Select -> Yes, please continue
 Select TDC mode -> common stop
 Select Update. Dismiss window.

Start DAQ
 I'm in my office (x5250) if you have problems/questions.

Cheers
 Tom
 --- 8<-----
 Dr. Thomas Davinson
 School of Physics & Astronomy,
 The University of Edinburgh,
 James Clerk Maxwell Building,
 The King's Buildings,
 Edinburgh. EH9 3JZ. UK.
 Email: t.davinson@ed.ac.uk
 Tel: +44 131 650 5250
 Fax: +44 131 650 7003
 --- 8<-----

See original email from Tom overleaf

On Mon, 23 May 2011, Brian Fulton wrote:
 Tom
 Just got away from the experiment and found this email from you.
 I'm on shift and can have a go at this if you think it is better to make whatever change is needed. If so, perhaps you could give me instructions.

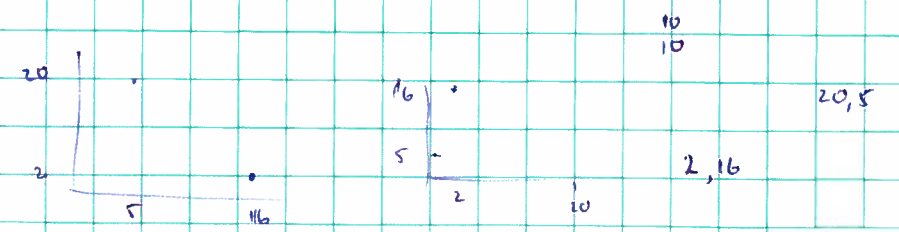
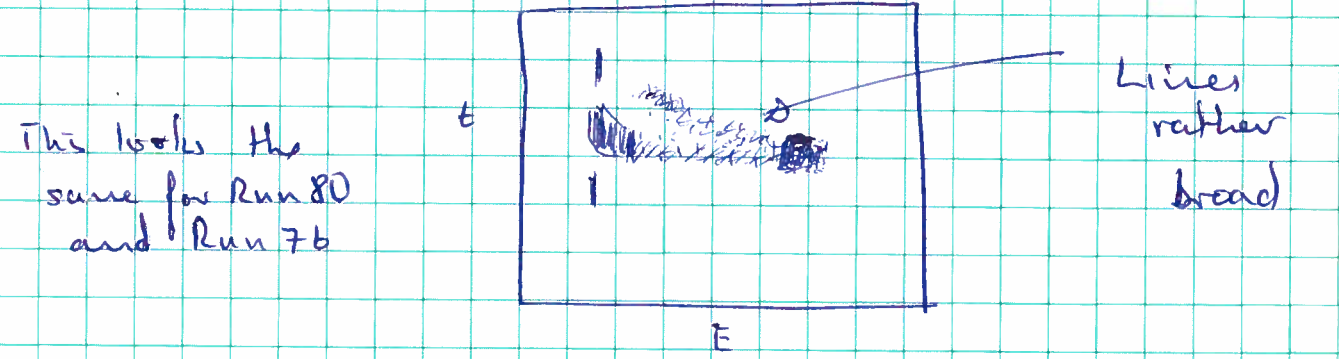
Brian
 On 23 May 2011, at 10:15, Thomas Davinson wrote:

Run 80 Start 03:59 (only change is TDCs set to common stop mode)
 Stop 04:38 as operators say bundle tripped.

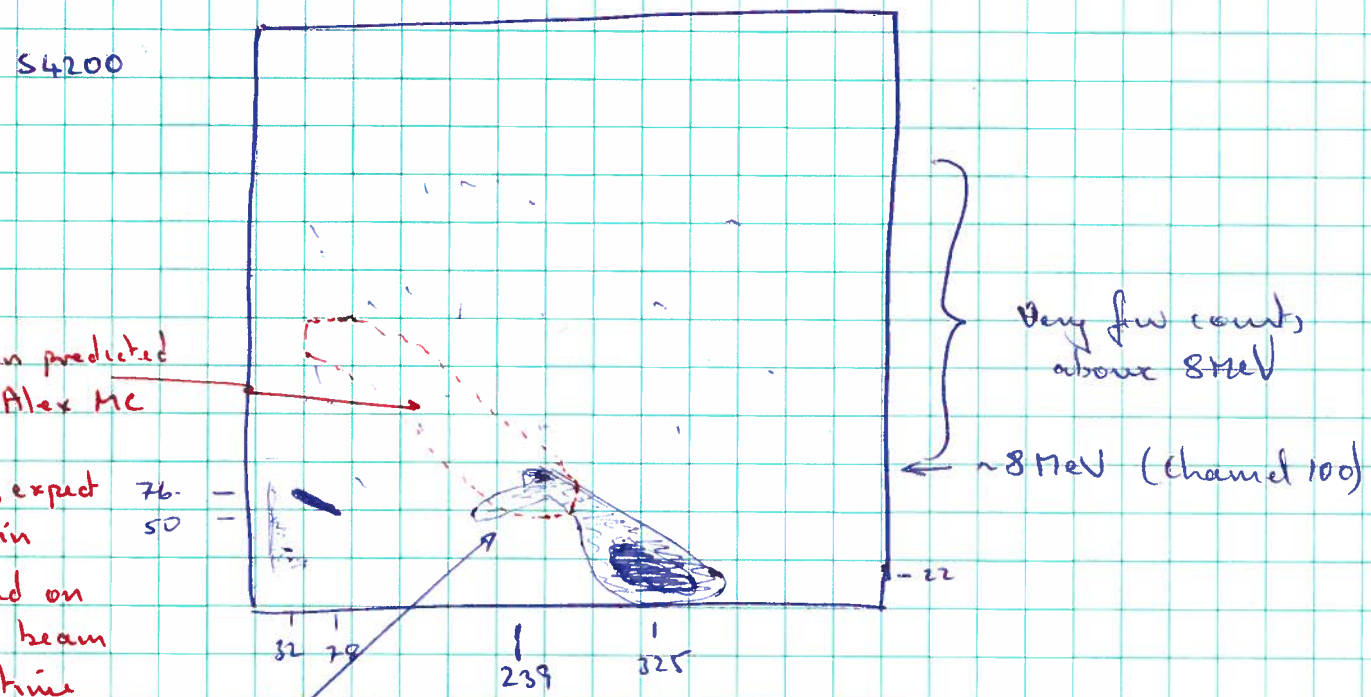
Run 81 Start 04:45
 Stop 06:54 →

Pressure	249.084
Leakages	S2-1 5.40 μ A
	S2-2 2.86 μ A
Temps	10.2 Cooler
	21 Gas
	18 Preamps
Live time	60%

NB The TDC/DAQ change does not appear to have resulted in a change to S2010, which is E(xaxis) vs t(yaxis) for ~~stop 1~~ ring 10 on S2-1



chat to Alex on the phone and he has rerun his sim for this energy with struggle switched on.



Could be punch through for protons ($E_{max} \sim 8 \text{ MeV}$)? But from reactions off H_2 in gas, or water vapour on windows?

Rate Spectrum

High counts in channels	265	} Need to identify which these are
	266	
	271	

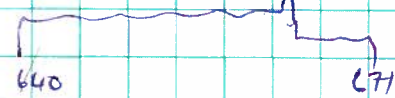
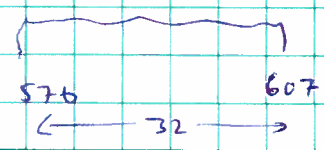
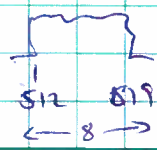
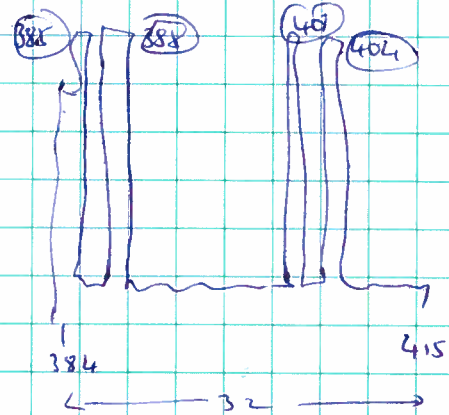
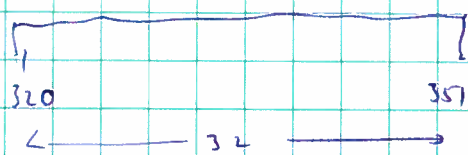
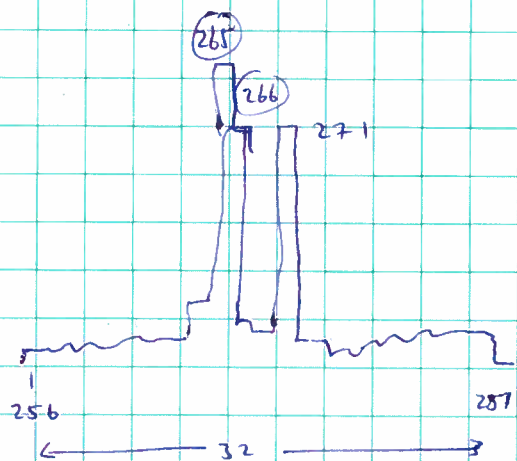
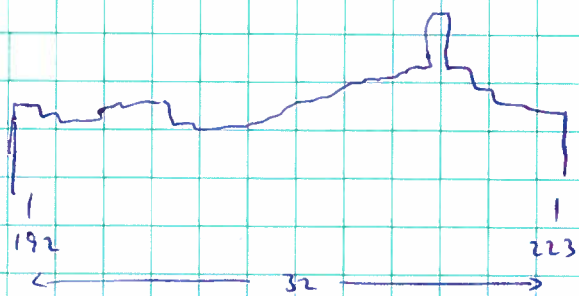
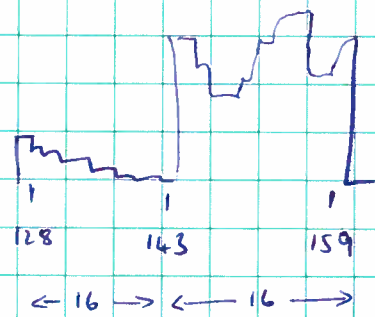
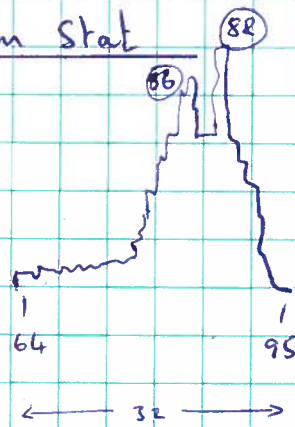
Run 82 start 06:57

As preamp up to 18° have reduced setpoint on preamp to 9.5

Questions at end of Shift

- ① If analysis of 54200 is right, where do proton coincidences come from and will we be able to see our events in the region above 8 MeV? Is this still the case at lower energy
- ② Can threshold on above 3 high channels be raised and would this enable us to run at a higher rate?
- ③ The ~~bars~~ ^{peaks} in the Evt + spectrum look rather broad. Is this OK?
- ④ Nearly caught up with sorts. Run 78 + 79 to complete
- ⑤

pectrum Stat



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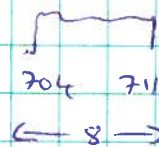
& Understood by me,

Date

Invented by:

Date

Recorded by:



If association on opposite page is correct, then count rate dominated by S2-2 front strips

ADE#4 Channel 9, 10, 15

These have ~4M in peak
 we think this is cf ~0.3M in others
 S2-2 strips 34, 36, 46

Alison wonders whether the fact we may have a poor tune from having done this with window in place is an issue. To check this will sort an old run

NB

Sorted Run 54 which was the previous energy when a good tune was made with the entrance window removed.

Features in the E vs t and S2-1 vs S2-2 spectra look the same

Wide line resolution appears in earlier calcs too.

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0934 (Start RUN 82 06:57:05)
 End RUN 82 09:36:13

Start RUN 83 09:36:49

RUN 82 Spectra saved + zeroed.

Preamp temp = 18°C

Coder OK

Pressure 249.3 T H₂

FCφ ~ 1#cpA

Checking gas out run to see if the S2-1 vs S2-2 and E vs t problems are there as well. (Run 68)

~~XXXXXXXXXXXXXXXXXXXX~~

Answer: S2-2 vs S2-1 spectrum empty suggesting p coincidences from volume of gas

E vs t still broad - strange.

Now confusion as it appears Sert Fool may be replaying previously connected file

Exit Midas
 Restart Midas

Run 54 has proton locus and E vs t is OK
 [This was run at 4.44 MeV gas in]

Run 81 has proton locus (at lower energy) and E vs t was OK
 [This is recent run at 4.11 MeV gas in]

Run 68 has no proton locus, but E vs t is broad
 [This was run at 4.44 MeV gas out]

Still a bit nervous. Run 81 was a long run, but the sort only took a short time. Run 68 is a short run, but the sort is taking a long time.

Re-do, watching carefully in Terminal session to check have the right file.

Run 54 has proton locus and E vs t is OK
 at 5.5cpA (= 1ppA = 6x10⁶/s)
 This is a 2 hour run. Jamie estimate 1500/hr at 10⁸/s
 So should see $1500 \times 2 \times \frac{6 \times 10^6}{10^8} = 180$

See 25,000 events - so OK

Run 68 no proton locus and E vs t bad

Run 79 p locus and E vs t bad

Run 81 p locus and E vs t good

For summary of what this means, see next page.

12:01 pm Run 83 Stop. 12:00:34 16 epA
 Run 84 Stat 12:48:34

12:49 Run 84 ~~Stat~~ Stopped 13:45:57
 18 epA

SPF + AMC recabled trigger to the following

Logic Module 1 (from right)	S2-1 Front
2	S2-1 Back
3	S2-2 Front
4	S2-2 Back
5	PD

Confirmed that all rate is coming from inner strips of S2-1.

Loading of signals on scope shows high rate coming from large (~4V) signals. This is consistent with rate from elastics. Raising appropriate threshold did not decrease rate.

changed trigger to

coincidence between S2-1 and S2-2

OR S2-2

OR PD.

Summary

There is a problem with the Sort in that it can on occasions not pick up the connection to a new file. Apparently this has been seen before. This has been plaguing us for some time. Need to be careful ~~not~~ to watch in the terminal frame that Σ the right file is being analysed.

Summary of what we believe:

- ① The locus at bottom right of the S2-1 or S2-2 plot is not reaction data but elastic scattering.
- ② The Σ timing plots are OK except for the period between Run 64 (after the computer crash) and Run 80 (after BRF carried out Tom's instructions for common DT). The email from Tom says this data can be recovered.

~~XXXXXXXXXX~~

Now increasing beam to see what the limit will be with the reduced trigger (coincidence) requirement.

NB This also means that none of the ~~if~~ saved spectrum files of replayed data can be trusted. Σ

e No. _____

RUN 85 Started 13:59:00
Stopped 14:00:31

by higher beam rate factor of 10. epA, almost 100% dead.

beam back to 17epA. R86 Stat: 14:06:06 Live time
Stop: 14:11:47 >90%

beam = 120epA (1.5 x 10⁸/s)

$$\frac{120 \times 10^{-12}}{5 \times 1.6 \times 10^{-19}}$$

R87 Start: 14:09:12
Stop:

Triggers: 7k
Acc. Trigs: 4.1k

454	(Rates)	0	7500
	(Scalers)	1	4407
		2	1055
		3	1051
		4	10
		8	1782
		9	52810
		10	2047
		11	48000
		12	1708
		13	2797
		14	1967

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16:16 Oliver and Micham on shift

STOP RUN 87 # Blocks = ~~116121~~ 116121

Leakage current S2-1: 3.3 S2-2: 4.3

FCO: 120 epA

pressure CMS = 250.06 T Rates: 0 7580

pressure CG4 = 0.002 T (scalers) 1 4219

deadtime = 4219/7580 2 992

3 1008

4 0

5 0

6 0

7 0

8 1887

16:20 NEW RUN 88

9 56496

10 2147

17:12 Gas temp ≈ 30°C

11 50969

12 1747

Preamplifier temp ≈ 16°C

13 2795

14 2159

Cooler temp ≈ 10°C

18:25 STOP RUN 88

FCO: 120 epA

START NEW RUN 89 Sealer 0: ~~7079~~ Sealer 1: 412

Leakage current S2-1: 4.2 S2-2: 4.6

gas temp = 30°C

preamplifier temp = 18°C

cooler temp = 10°C

pressure CMS 250.305 T

pressure CG4 0.002 T

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25 STOP RUN 89

FCD = 130 epA

S₂-1 4.5 MA
S₂-2 4.6 MA

CMS 250.549 T
CG4 0.002

dead time 4248 // 7629

Scalers

0	7629
1	4248
2	989
3	1015
8	1848
9	54378
10	21487
M	49867
12	1649
13	2682
14	1934

32 START RUN 90

FCD = 133 epA

S₂-1 5 MA
S₂-2 4.7 MA

CMS 250.305 T
CG4 0.0002 T

deadtime 4373 / 7983

Scalers

0	7983
1	4373
2	992
3	1006
8	2164
9	58211
10	53528
11	2275
12	51491
13	1752
14	2930

1:37 STOP RUN 90

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Date

Recorded by:

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22:38 START RUN 91

23:35 Cooler temp = 9 °C
gas temp = 22 °C
preamp temp = 17 °C

Tues day 24th May

Stopped 01:19:36 #36471 blocks

1:20 FCD 120 epA

Started run 92 @ 01:23:12

Scalers	0	6814
	1	4067
	2	1000
	3	1015
	8	1813
	9	7147
	10	2174
	11	4991
	12	1502
	13	2528
	14	1811
	15	0
	16	0
	17	5039
	18	2161

leakages S₂-1 5-20
Z₂-2 4-43
PD 0-46

Preamps 15 °C
Gas 22 °C
Cooler 8-20

Pressure 249.573 Torr

1:35 Stopped 01:35:23

blocks 10370

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Date

Invented by:

Date