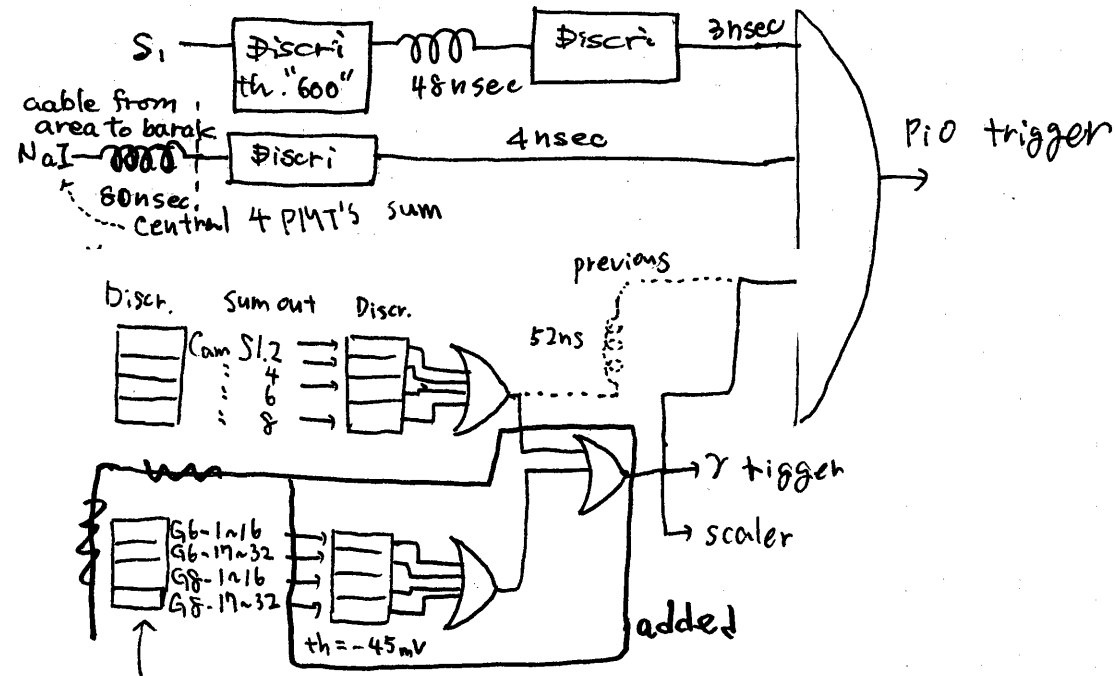
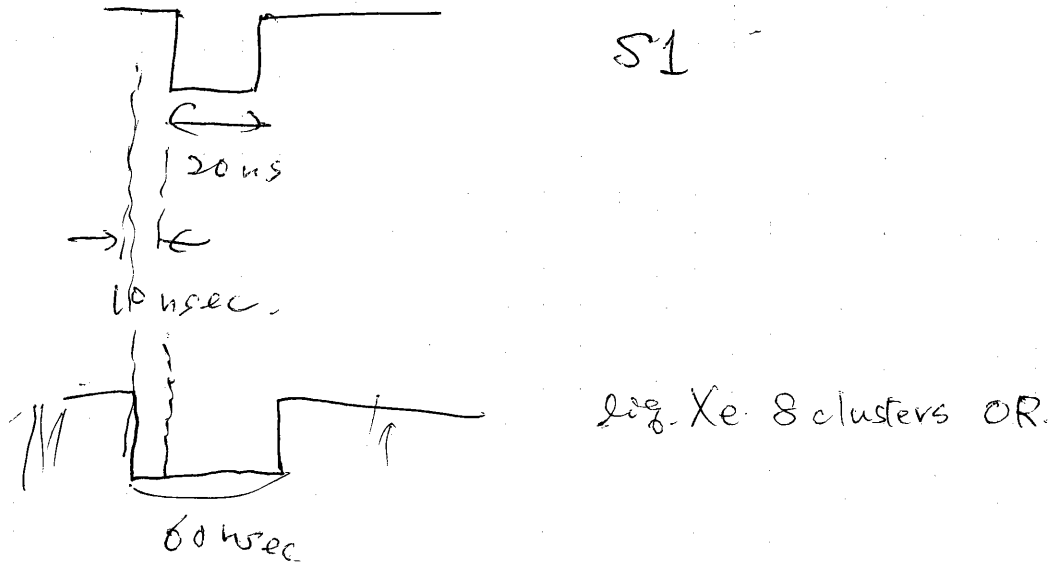
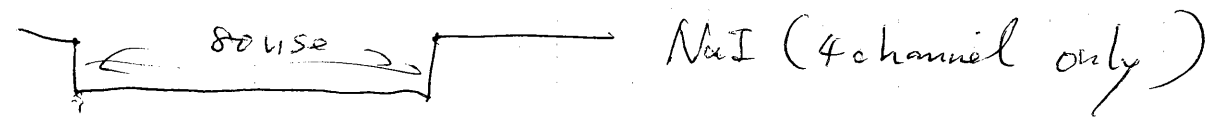


Trigger Timing adjust again



see previous page for the clusters in backwards.

ADC gate ~~timing~~ timing of normal run is ~50 nsec later than before

Xe self trigger was changed to "8 clusters or". Please attention when you take data as "normal run".

17/Oct/2003

21:11 # 5553 Failure
 21:20 # 5556 pedestal beam on
 21:22 # 5557 LED beam on
 # 5558 LED beam on
 21:44 # 5559 α beam on (beam current 1687 nA) failure because of disk full

C: drive on DAQ PC full
 moved data to E: /030927-0312-PSI1

22:14 # 5560 α beam on
 22:21 # 5561 LED beam on
 22:31 # 5562 S1 * (NaI central 4 PMT sum) * (Xe 8 clusters or) ~30 Hz beam current 1685 nA
 22:35 circulation stop because LN2 seems empty.
 23:04 # 5563 S1 * (NaI central 4 PMT sum) * (Xe 8 clusters or) ~30 Hz 30000 units. DAQ
 23:27 Circulation Pump Restarted after replacing log N2 drum Flow rate 8.2 lpm
 23:42 # 5564 S1 * (NaI central 4 PMT sum) * (Xe central 4 PMT sum) Same as #5524 TRIGGER RATE 2 Hz

18/Oct/2003 # 5564 stopped ~20000 units.
 2:55 Circulation is stopped for ~~estimating~~ refrigerant cooling power for a while as requested by Tom Maruyama
 Cold head temperature does not go down below 170.3K. Need Regeneration Again
 DAQ PC Rebooted ... FAL & SCFE trouble ... OK. Rebooted successfully

3:23 # 5565 Pedestal RUN Beam OFF
 # 5566 LED Beam OFF
 3:28 Circulation Pump is restarted!
 3:35 # 5567 α RUN Beam OFF

18/08/03
3:43

RUN #5568

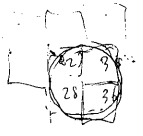
~20000 events

S1 * (NaI central 4PMT SUM) * (Xe central 4PMT SUM)

TRIGGER RATE ~ 2Hz

PROTON CURRENT ~ 1.7 uA but sometimes down since they are tuning from 0:38.

On-line analyzer. ntuple. BANK SWITCH for NaI ADC values are now in on-line ntuple.



7:00

Discriminator module used for S1, NaI 4PMT SUM. and charged veto. is found to have unstable threshold settings.

This module is replaced to another one (PSI) (LRS)

Threshold levels for these three counters are set to -50mV. Widths of S1 and NaI are set as written in 2 pages before.

7:18

RUN #5569

S1 * (NaI central 4PMT SUM) * (Xe central 4PMT SUM)

PROTON CURRENT. 1.74 uA TRIGGER RATE ~ 2Hz stopped in 40 minutes to activate FTP Logger.

~8:00

FTP Logger activated.

Logger / Channels 111 Settings

> set Type FTP

> set Filename archftp_21, meg, mu-e-gamma, 2003_1/data, run%05d.mid

Please keep the FTP logger activated as far as no network problem

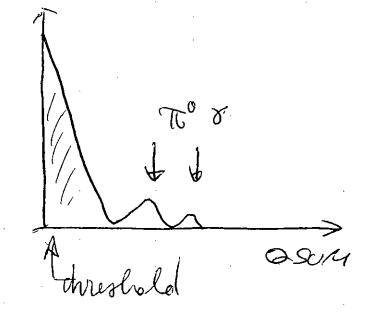
18/08/2003

8:06 RUN 5570

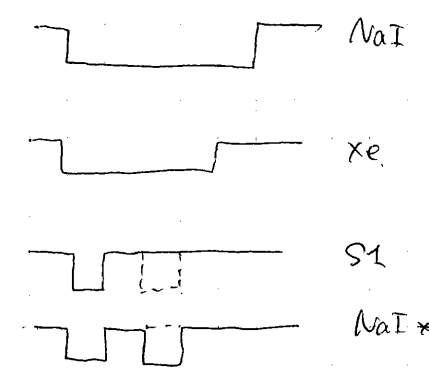
SAME AS 5569

SUMMARY

New trigger "8 clusters OR" has effectively very low threshold. The QSUM histogram in RUN 5562, 5563 is like that shown in the light.



In RUN 5562, 5563, accepted event rate was ~30Hz, while from scaler data trigger rate was ~40Hz, which may indicate there is 25% dead time, even at this trigger rate. The DAQ has capability to take up to ~90Hz without dead time. So this is probably due to mistake of providing scaler signal.



If S1 signal comes again after 25 usec, the coincidence signal may be generated twice depending on the coincidence module setting. This must be checked and observed to change the way for providing signal to the scaler.

- FTP Logger is activated. Please keep it unless no network trouble.
Refrigerator cooling power looks to deteriorate again! We, probably, have to regenerate it.

Fix up

- Discriminator for S1, NaI 4PMT SUM, charged veto was replaced because of unstable threshold setting.

Problems to be fixed

- Now S1 AAC histogram can be filled, but the distribution seems to be funny. There is a base-line shift at ADC input.
TDCs for S1, charged veto, RF are not read out yet.

18 Oct 03

DAQ plan

- Take 100000 events in total with NaI4SUM * Xe4SUM * SI
- Then take > 300000 with NaI4SUM * 8 clusters OR * SI

TDC/7186 check

TPC CH	Entry	histogram ID
1	0	2176
2	X 3	2177
3	0	2178
4	X 4	2179
5	0	2180
6	X 5	2181
7	0	2182
8	X 8	2183
9	0	2184
10	X 8	2185
11	0	2186
12	X 3	2187
13	0	2188
14	△ 479	2189
15	0	2190
16	△ 706	2191

- TC 2
- TC 3
- TC 4
- TC veto
- Si70
- RF

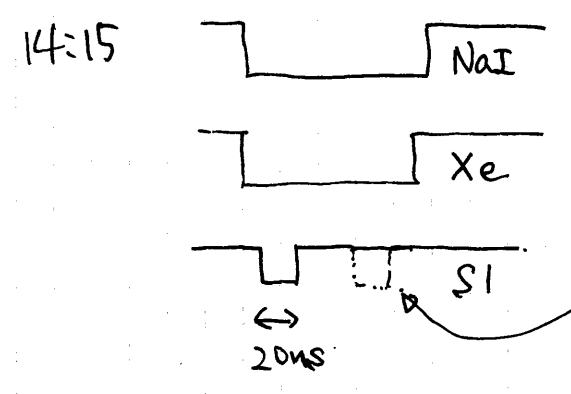
odd ID channel — hist filled when common stop comes.

even ID — miss filling

camac tdc channel (address) & data seems to be problem.
 for example. (camac-tdc[i] >> 12) → # of channel variable's number is not proper. in tdc calib.c

1 2128

12:10 Run 5571 same as 5570 ~ 3.9k events



to remove these accidental coincidence, SI gate width changed to 130 ns from 20ns.
 No changes for timing.

→ But the trigger rate of (Xe 8 clusters) * (NaI center) * SI was not changed. } request ... 40 Hz
 accept ... 30 Hz.

→ other problem? (DAQ dead time or coincidence gate?)

15:20 Run 5572 pedestal.

15:25 Run 5573 LED @ beam on.

15:35 Run 5574 alpha @ "

15:43 Run ~~5575~~ same as 5569.

SI * (NaI center 4) * (Xe center 4).

18:00 stop circulation because LN₂ is empty. it should be change after this run.

18:24 #5575 finished 18317 events

19:00 change LN₂ 100 l → 100 l restart circulation

19:05 #5576 SI * (NaI center 4) * (Xe center 4)

19:35 #5576 stop 3589 events

20:35 Run 5577 same as 5576

(NaI 4 central) * (Xe 4 central) * S1

#5564	22.5 K	
#5568	19.8 K	
#5569	5.6 K	
#5575	18.3 K	(69.9 K in total)
#5576	3.7 K	
#5577	29.0 K	(98.9 K in total)

19/10/03

0:51 #5578 Pedestal beam off (slutter closed)

0:57 #5579 LED beam off (")

1:02 #5580 a beam off (")

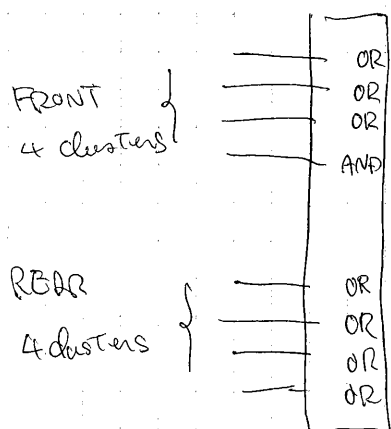
1:17 TRIGGER IS SWITCHED BACK TO S1 * (NaI CENTRA 4 PMT SUM) * (Xe 8 clusters OR)

#5581 started with ~~same~~ this trigger

This trigger is for studying ~~the~~ very deep events which would probably be lost in Xe central 4PMT triggers.

TRIGGER Electronics BUG ????

STOP the RUN and have a look at the electronics



Only this channel set to be "AND"

is found in RUN 5581

Maybe "only 1 channel "AND" " is same with "All OR" - but we set it to OR.

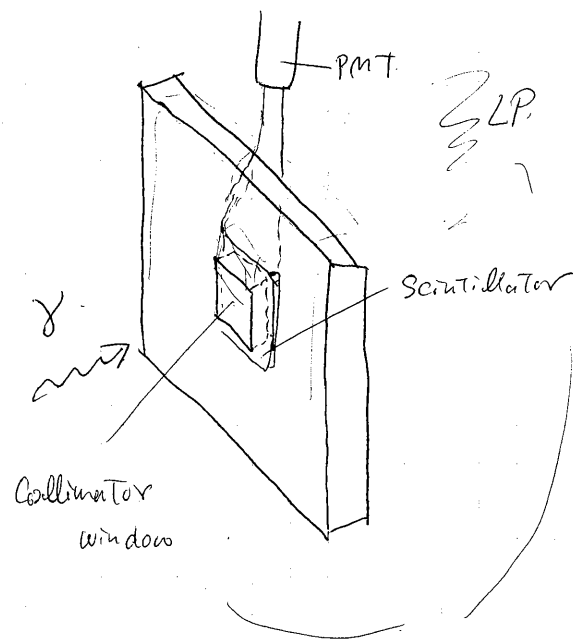
1:55 RUN #5582 SAME AS RUN #5581
2:56 RUN #5583 "

Veto Counter is moved from NaI side to LP side.

While this work, we found that the Veto Counter (Hamamatsu PMT), marked "2" did not work correctly. Its output signal indicates that there is some spark somewhere. This is the reason why we could not increase HV for this counter (limited up to -1600V).

The counter is replaced to another one, Peter's counter with XP2020. We can see clean signal from this counter on oscilloscope.

Applied HV = -1950V



RUN #5584 Veto Counter Test (very short)

RUN #5585 Fail...

RUN #5586 ~~test~~ for adjusting Veto counter pedestal Pedestal RUN

6:03 RUN #5587 Veto Counter test.

S1 * (NaI Central 4PMT SUM) * (Xe 8 cluster OR)

2003/10/19

8:22 Run # 5588 pedestal @ beam on

} requested 100 Hz
accepted ~ 50 Hz

8:25 Run # 5589 LED @ beam on

} requested 100 Hz
accepted ~ 50 Hz

8:35 Run # 5590 alpha @ beam on

8:45 CAMAC ADC & TDC readout was stopped

by using (#undef RO-CAMAC-ADC)
(#undef RO-CAMAC-TDC) in frontend.h

just because of the test for checking the real DAQ deadtime.

test run of pedestal. requested ~ 100 Hz
accepted ~ 100 Hz } good!

" of LED requested ~ 100 Hz
accepted ~ 100 Hz } good!

test run of TPO trigger (S1 * NaIcenter * Xe80v) requested ~ 40 Hz
accepted ~ 30 Hz } bad!

→ The difference between requested & accepted event rate was not from DAQ but from electronics in TPO trigger(?).

For pedestal & LED run, the difference was from DAQ.

→ TPO trigger 40 Hz.

the gate width ~ 8 msec. (from start to stop by DAQ).

accidental coincidence rate

$$40 \text{ Hz} \times 40 \text{ Hz} \times 8 \text{ msec} = 12.8 \text{ Hz}$$

that's why there are differences between requested & accepted.

10:40 Liq. N2 empty.

11:00 Liq. N2 exchange 100L → 100L.

L7, R7, T7 signal coming to burndy. (also to ADC inputs) but no ADC data.

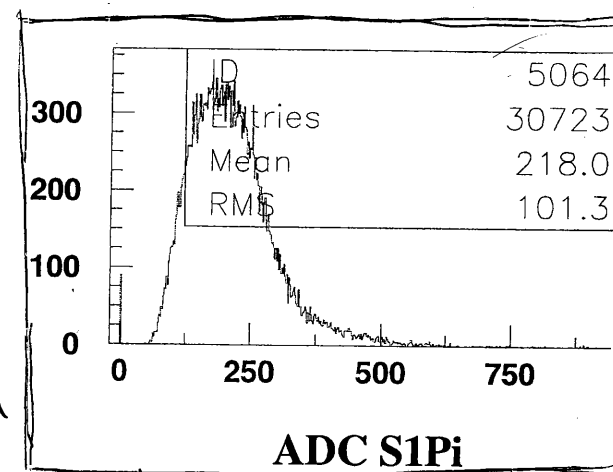
→ Burndy & ADC connection check done. later. these channels (L7, R7, T7) recovered. connection failure? O.K.

12:14 HV trip 13-4 (BK4) → recovered.

13:22 pedestal @ beam on. Run # 5591

HV trip 6-2 (L21) → recovered

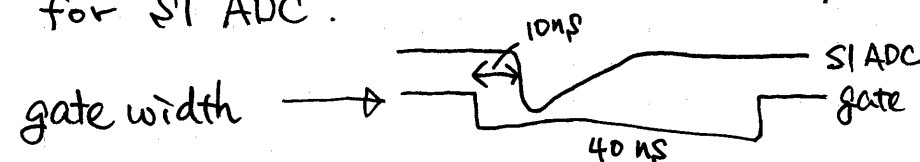
14:26 HV trip 6-1 (BT21) → recovered



Notice!
TDC 7186's dip switch was set to common start.
other camac TDC 7186H was set to common stop.

17:00. Run # 5592

SI ADC test run. (S1 trigger only used)
new ADC card installed into CAMAC of CRATE (2249A) 7 slot.
for SI ADC.



17:32 Run # 5593 pedestal @ beam ON.

17:34 Run # 5594 LED @ beam ON

17:44 Run # 5595 alpha @ beam ON

19/Oct/2003
 17:53 RUN # 5596 (NaI * S1 * Xe Center 2x2.PMTs).

proton current ~ 1.8 mA
 Trigger rates ~ 2 Hz.

18:35 HV error. → stop RUN # 5596
 18:57 RUN # 5597

removed *.SHM. and reloaded 031018.odc
 → SCFE restarted successfully
 → saved the latest odcfile as "031019.odc"

→ stop RUN # 5597 to check the F/B TDC

19:18
 FB TDC test. by using LEDs.

ⓐ Current problem

slot 21 TDC ... OK
 slot 19 TDC ... cannot read out. But signals such as common-start, and each input are normal. Also the timing between common stop to each input is adequate. (40 ÷ 50 nsec).
 Every channel falls into \emptyset ch

ⓑ Test 1.

Swap common-start cables

result: slot 21 TDC can read out.
 slot 19; every channels hit \emptyset ch.

⇒ No problem with common-start cables.

ⓒ Test 2.

• enable only slot 19, disable slot 21 in frontend.c and tdcCalib.c . analyzer.h

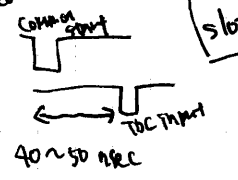
⇒ Each channels of slot 19 still return \emptyset ch.

• On the contrary, enable 21, disable 19.

⇒ TDC channels in slot 21 return normal value. (~10 nsec)

Conclusion: I was afraid that ^{only} the first TDC can read the channels by bugs in FIAL source codes, but I couldn't see such bugs in FIAL.

ⓓ Test 3.5
 Also checked the timing common → input with oscilloscope.



Both TDCs are OK.

ⓔ Test 3.

Slot 19 TDC has a longer dead-time than slot 21's?

• reduced the delay time in trigger circuit, 70 nsec → 40 nsec.

⇒ TDC slot 21: ~ 40 nsec
 TDC slot 19: \emptyset ch

Conclusion: It seems no difference of dead-time in both TDCs.

19/Oct/2003

ⓕ Test 4.

changed slot of the TDC.

⇒ Nothing changed... improved...

ⓖ Test 5

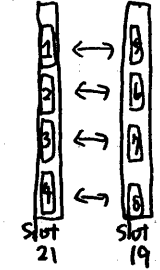
Test 4 + removed TDC in slot 21.

⇒ Nothing changed. (slot 21 TDC does not affect slot 19 TDC)

ⓗ Test 6.

re-inserted the normal TDC into slot 21, the strang TDC into slot 19, so that, ~~recovered~~ as they were.
 recovered

Then, swapped the cables for TDC inputs. as below.



⇒ Channels in TDC(slot 21) return the values expected in slot 19 TDC

Summary

- There seem no bugs in FIAL source codes.
- No problems with cables such as common-starts and TDC input flat cables.
- The FIB crate itself has no problem with anything.
- TDC in slot 19 can be initialized and returns LAM(?) normally, while only the read-outs are abnormal (return value = \emptyset ch), _{always}

I can guess the Read-out circuit in slot-19 TDC is broken.

K.O.

19/Oct/2003

21:20

blue code on the burst-guard for slot-11 ADC was separated from the burst-guard board.

⇒ Fixed by YH.

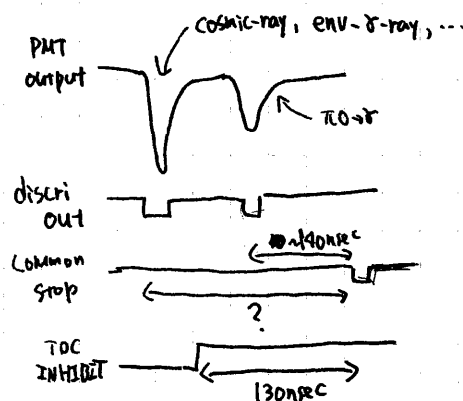
TDC status.

- Fast bus
 - ⊙ slot 21 ... OK, available
 - X slot 19 ... inner circuit broken? Not available.
 - X slot 17 ... broken. wait for being fixed.
- CAMAC
 - X station 19
 - X station 20
 - X station 22
 } should be in COMMON-START mode. (X)
 12 x 45-m flat cables required and should be ordered.

⊙ Station 23 ... working in COMMON-START mode.

~~Why?~~

(X) You can take the data if you don't need ~~COMMON~~ INHIBIT for removing pre-hits in discriminator, although pre-hits probability is not so high.



In principle it is impossible to generate ~~INHIBIT~~ till 130-nsec past of ~~COMMON-START~~. possible

Which is better, { COMMON START for every TDC which requires 45m cables, or COMMON STOP for some TDCs which requires 60nsec cables.

In my opinion, COMMON-START ^{for all} is desired because I don't like such ~~the~~ situation that some TDCs are in common-start mode, the others in stop mode.

19/Oct/2003

22:03 pedestal RUN. #5578. All channels, OK.

22:13 LED calibration RUN #5579. @ BEAM ON.

- ADC channel #104 ~ 139, they has no data @ #5579. I found the delay cables @ FB ADC input were slanted, ⇒ reconnect, OK.

22:26 LED calibration RUN, again. #5600.

23:03 α-ray. #5601. @ BEAM ON.

23:46 RUN #5602. no data run.

- Trigger : S1 * (NaI center 4) * (LXe center 4).

- Counting rate : { requested : 1~3 Hz, accepted : 1~3 Hz.

- Proton Beam : 1.25 mA.

23:58 Scoop the RUN #5602.

We found the voltage setting for Veto counter is wrong. So, we stop the run, and applied correct high voltage. -1950V.

Maybe previous HV firmware loaded.

(⇒ see comment of #5584.)

Notice!!

23:58 #5603, no data run.

- same as previous condition.

20/Oct/2003.

4:00 Stop the RUN #5603. 140000 events taken.



5:00 Pedestal RUN : #5604 : pedestal for previous run since the HV of the Veto counter was changed before beginning run 5603

We changed the high voltage value of TC Veto counter 1950V ⇒ 2050V.

05:08 #5605. pedestal RUN.

05:09 #5606, start. ⇒ same as #5603.

20/ Oct. / 2003.

05:30 RUN #5606 stopped due to exchange the LN₂ tank. and circulation stopped.

LN₂ tank 100 L → 100 L.

LN₂ circulation restart.

07:31 RUN #5607 start.

- same as RUN #5606. S1 * (NaI x 4) * (Xe x 4). trigger.

08:40 RUN #5607 stopped. ~ 25000 events taken.

08:44 RUN #5608 pedestal run.

08:52 RUN #5609. LED calibration RUN.

09:20 Run #5610 alpha Run.

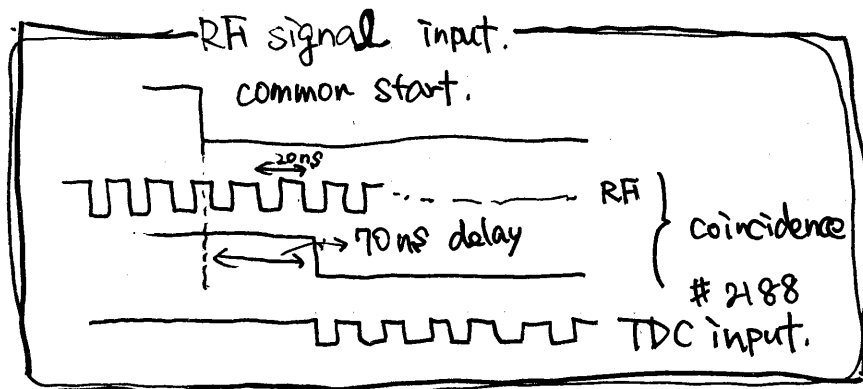
I see that ASLS1 Value written to file is ^{DAC} -11492 did someone optimize ASL over the weekend? In principle I think the problem with the ASL ADC Value has been fixed. I didn't reoptimize on Friday night because I wanted to wait until the electronics situation / bug is clear.

I will do final optimization using S1 & RF later.

However one does not need to change ASL Value now!

ASLS1 = -11492
 Baser Scales rates
 S1 1450 k / 10⁵ p
 S1.RF 939 k / 10⁵ p

7186 TDC check by KO, TI.

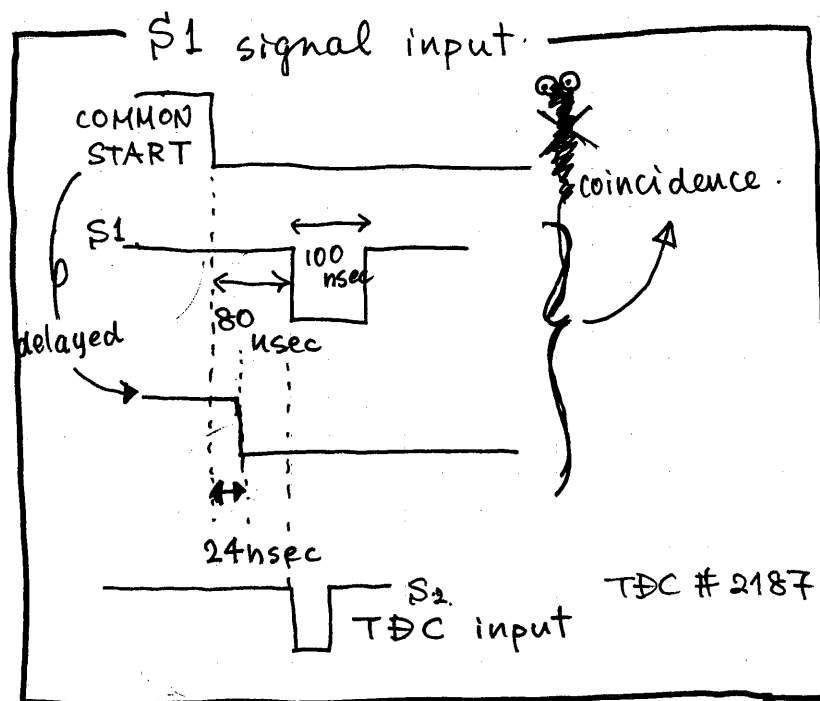


Previous TDC data was thought to be ^{for RF} deadtime. So we veto the first 70 ns RF signal and then we could see TDC data of RF. and, Logic fan-out ~~switch~~ inputs after G.F. seems to be mistake. 2 inputs from 2 different G.F.s are supplied during tx/b switch mode. → fixed.

12:05 Run # 5611 (NaI central 4 PMTs) * S1 * (Xe central 4 PMTs).

Trigger rate : 1~2 Hz
 proton Beam Current : 1.769 mA

→ STOP the RUN #5611. ~~to~~ insert S1 signals to TDC by TI, YH.



Charged Particle Veto signals

No TDC counts currently

- Details
- We ~~adjust~~ adjust the timing of COMMON START and charged Particle Veto.
 - We put the signals of charged particle Veto into TDC #2186. → All the signals were counted as "100".
 - checked the TDC channel #2186 using RF & S1 signals. → OK. no problem.
 - Put charged particle Veto signals to other TDC channels. → the signals were counted as "100".

17:01 HV error (HV 1-1. PMT BT9) → recoverd. via web page. OK!

17:05 pedestal @ Beam ON RUN #5612.

17:07 RUN #5613 LED @ Beam ON.

17:18 RUN #5614 alpha @ Beam ON

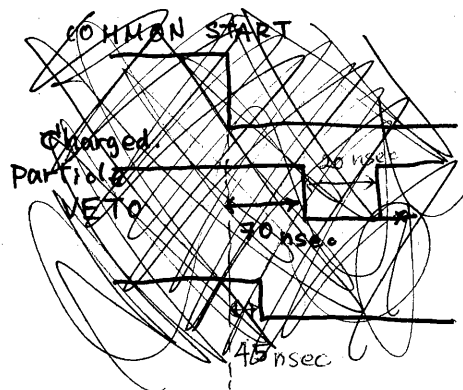
18:04 RUN #5615 S1 * NaI center * Xe center

Trigger rate 1~3 Hz

proton current 1.7 mA

At the beginning of this run, proton current was 0 A. It soon recovered to 1.7 mA.

18:52 → stop RUN # 5615 acquiring 6157 events.



2/10/03 0:15 RUN # 5617 LED
 RUN # 5618 ALPHA
 RUN # 5619 PEDESTALS } BEAM OFF.

0:10
 Liq. N₂ was empty, so we stop the circulation,
 Liq. N₂ replacement: 100L → 100L
 Circulation, restart,

0:15 ~ 2:30 We examined CAMAC TDC by AB, YH, HN.

- ① Using the 7186H as COMMON START mode, using the RF signal and S1 signal. ⇒ It doesn't work.
- ② Moving the 7186 to another crate (crate 1), ⇒ It doesn't work.

⇒ Timing has no problem. Crate has no problem.
 Software problem ???

02:30 RUN # 5620, α -trigger. (Si* (NaI central 4) * (Xe central 4)).
 - Counting rate: 1 ~ 3 Hz.
 - proton beam current ~ 1.8 mA.

06:40 #5620 stopped.

9:00 Labview Laptop is found to be sleeping.
 Never switch on the screen saver!

Due to this Slow Control did not work for about an hour and inner pressure increased to 9.7 Bar !!!!!!!

Circulation stopped for a while until inner pressure level comes to normal level.

9:30 Inner vessel pressure is still above 1.5 bar. I will go to see the dewar.

21/10/03
 Panel the ventilation valve of LN₂ dewar was opened!!!!!!
 Due to this times pressure did not go down quickly.

11:12 Pressure is now in proper level, but nitrogen valve is opened about two times in 30 sec. Deterioration of refrigerator cooling power again ???

12:13 Now pressure is stable and no need for cooling with nitrogen, although pressure level is around 0.135 Bar, which suggests deterioration of cooling power. → regenerate tomorrow (Wednesday).

14:00 Circulation is restarted
 flow rate 8.41 lpm.

9:00 ~ 14:00 CAMAC TDC Readout was investigated during waiting for stabilization of inner vessel pressure. FASTBUS TDC also. Satoshi

TDC (CAMAC 7186) readout had been unstable, sometimes correct RF signal could be seen and sometimes not. To solve this problem, this was probably because data memory in the module was not cleared, another line was added into the source code to clear the data memory using CAMAC function 11 to the address 3. Phenomenologically, we can read correct data out by ~~use~~ calling this function TWICE in every time. Now RF & S1 signal (TDC) are good as shown in the next page.

FASTBUS TDC RAW DATA was checked and was found to be correct (not equal to zero) at the level immediately after FASTBUS action. This means that the module is working correctly but there seems some software problem for filling the data into histogram.

Common STOP TDC (CAMAC)
 If the timing is as shown in 5 pages before, we can see some data from them. Take and analyze data. If we really need long cables I will order other that. Data quality can be OK. but be more delay cables for FASTBUS TDC.

21/08/03
 #5621 test RUN → not useful data
 14:00 #5627 π^0 trigger (SY * (NaI central 4) * (Xe central 4))
 found that TC veto center voltage is set to be 1950V
 should be 2050V
 Stop the RUN, and TC veto voltage is raised to 2050V
 Same the odb the case of unexpected for odb trouble.
 as 031021 - odb

15:08 #5624 Pedestal beam off
 15:10 #5625 d beam off

From run #5624, ^{some} NaI ADC channels are changed because there are two peaks of pedestals in some channels (NaI #12, 24, 36).

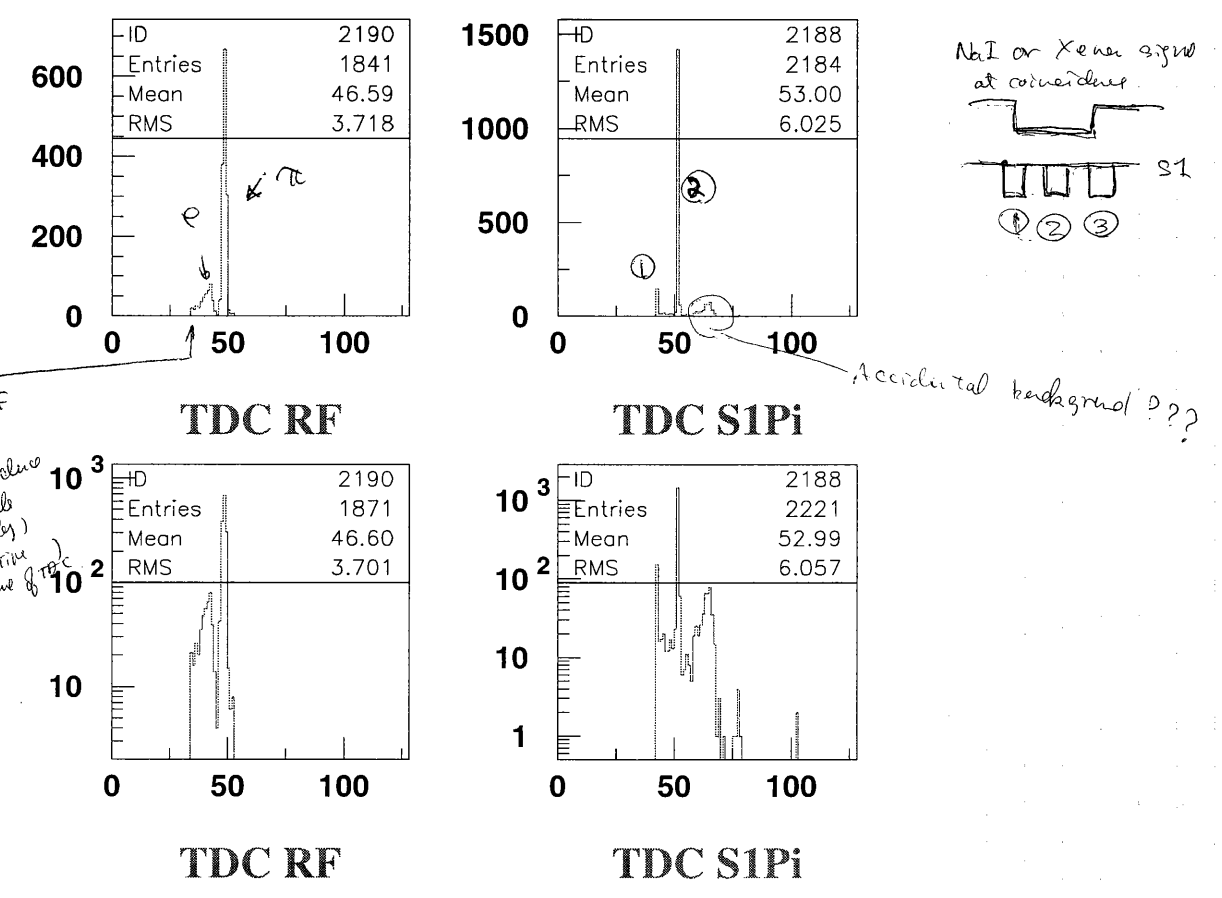
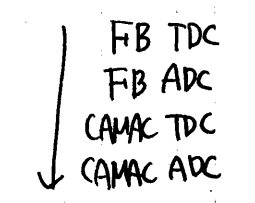
new channel connection
 { NaI #12 (B5) ADC slot 17 channel 5
 NaI #24 (D1) " 17 6
 NaI #36 (E5) " 17 7 }

in the analysis, same channel definition can be used.

19:05 arg. N2 empty 100l → 100l exchanged.

⊕ DAQ improvement in CAMAC read-out part.

- LAM on each ADC slot enabled at the beginning of run.
- " TDC " " "
- In loop of ADC read-out, check whether Q=1 or 0. (100times.)
- " TDC " " "
- swapped ADC read-out loop ↔ TDC read-out loop



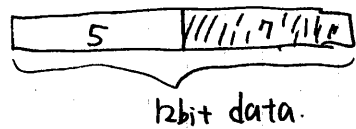
Coincidence timing of delayed start & RF
 70nsec - 15nsec (Coincidence window delay)
 - 20nsec (intrinsic time of TDC)

21/Oct/2003

• Problem with FB TDC

One of the FB TDCs can't read out. In fact every channel on it hits ~100ch. and does not fall in \emptyset ch.

Test
swapped modules.
slot 19 \leftrightarrow slot 21
(x)
(o)
↓
slot 19 \emptyset
slot 21 x
↓
Problem with hardware.



55
2~3nsec
H
0
nsec

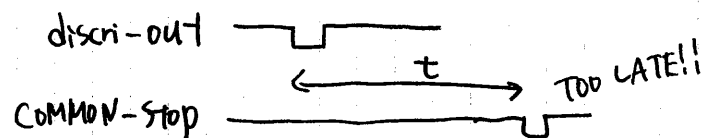
Normally TDC data consists of 12 bits. The broken TDC channels use only lower 7 bits. However they don't fall in \emptyset x7FFF if they are delayed so as to saturate. It is not just that the higher 5 bits are dead.

Anyway they return ^{values} around 100ch whatever inputs are.

Uninstalled slot 19 TDC.

FB TDC is now only one!

• TDC chart on 19/Oct was wrong. The real timing is as below.



$$t = \begin{cases} \sim 130\text{nsec} & \dots \alpha \text{ particle event mode.} \\ \sim 170\text{nsec} & \dots \text{TDC event mode} \end{cases}$$

We should give up the COMMON-stop scheme because INHIBIT signal is essential for removing backgrounds (α , cosmic-ray, ...) and anyway. I don't agree with common-stop. In order to introduce INHIBIT signal, both common-stop and TDC inputs have to be delayed.

7x 45m flat cables

21/Oct/2003

REQUIREMENT.

- 7x 45m flat cables
- 3x 100 Ω terminators for CAMAC TDC 7186
- 2x FB TDC 1875.

BEAM ON, Circulation ON

20:43	#5627	pedestal
20:56	#5628	LED
21:03	#5629	α
21:11	#5630	51x NaI-4 x LXe-4

← first π^0 run with good RF TDC data

22/Oct/2003.

0:53. RUN #5630 finished, after having received 30000 events.

#5631. : same as previous condition.

- trigger: $51 * (\text{NaI}4) * (\text{LXe}4)$.
- event rate: 1~3Hz
- proton beam current: ~1.8 mA.

1:23 HV error. HV1-1 (BT-9). Enabled via web, \Rightarrow ok.
RUN #5621 paused.

RUN #5631. resumed.

Moved Data files in c:/online/data to E:/030927_0312_PSI1	Copied Midfiles (#4505~#5636) from DAQ PC to offline PC
---	---

2:49 HV error HV6-1

↑
RUN #5631 paused
#5631 resumed (BT-21)

22 / oct / 03

8:20 proton intensity 0.8 mA

08:30 : Run # 5631 stops because of
"Error writing to archivftp"

Phoned to Stefan : answer: "keep trying and see if it happens again".

8:30 : # 5632 pedestals : beam off
8:35 : # 5633 led : beam off
8:45 : # 5634 α : beam off

Bad!
Don't use these files!

9:27	Target	Status	Other Vacuum	Compressor
	Pressure	Temp.	1.5×10^{-5}	~ 300 psi
	1.074	19.00		very stable!

9:30 Regeneration of the refrigerator cold head.
Circulation stopped.

Pressure (Inner Vessel) reached 0.133 MPa and does not go down anymore.

9:30 Refrigerator Central temperature set point at 250K.

10:04 Cold head temperature 280K
15 265K
45 295K

SWITCH ON the compressor

11:18 Inner vessel pressure 0.131 MPa
Cold head temperature -103.35 (169.8 K)

Nitrogen dewar replaced

11:35 0.130 MPa , 169.7K.

22/oct/03

11:36 Circulation Restarted 7.47 lpm

12:45 #5635 COSMIC RAY RUN

While this run, delay cables for PHILIPS discriminators are modified to avoid cross talk between adjacent channels.

14:10 #5636 Cosmic Ray Run

During this run, the beam shutter was opened.

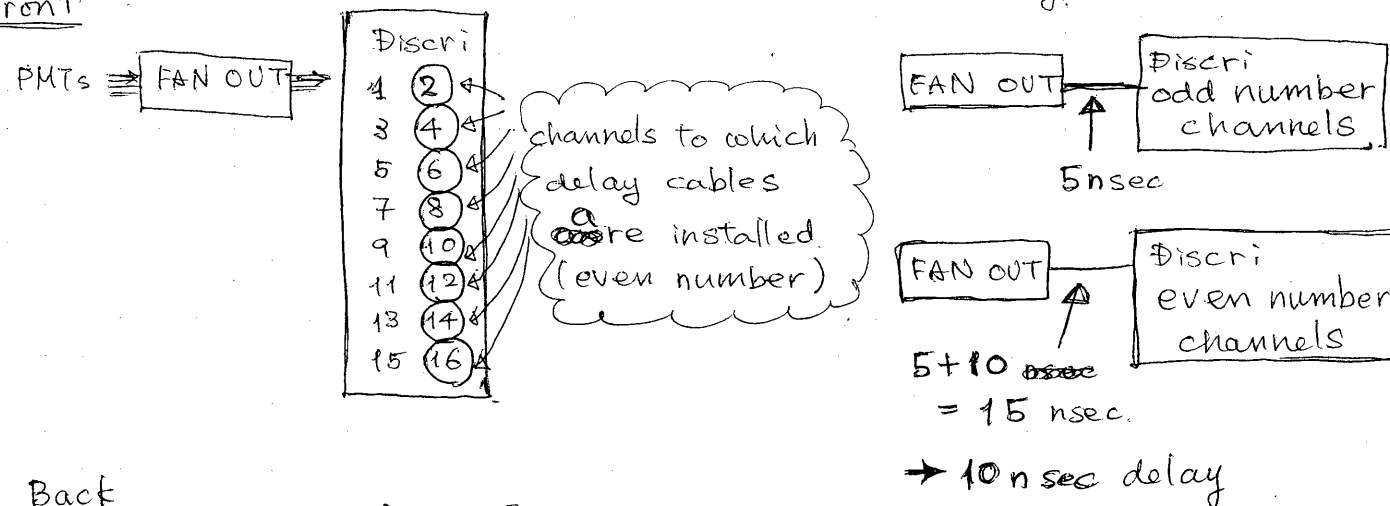
15:00 ~ 18:00

Delay Cables were installed between FAN OUT and discriminator

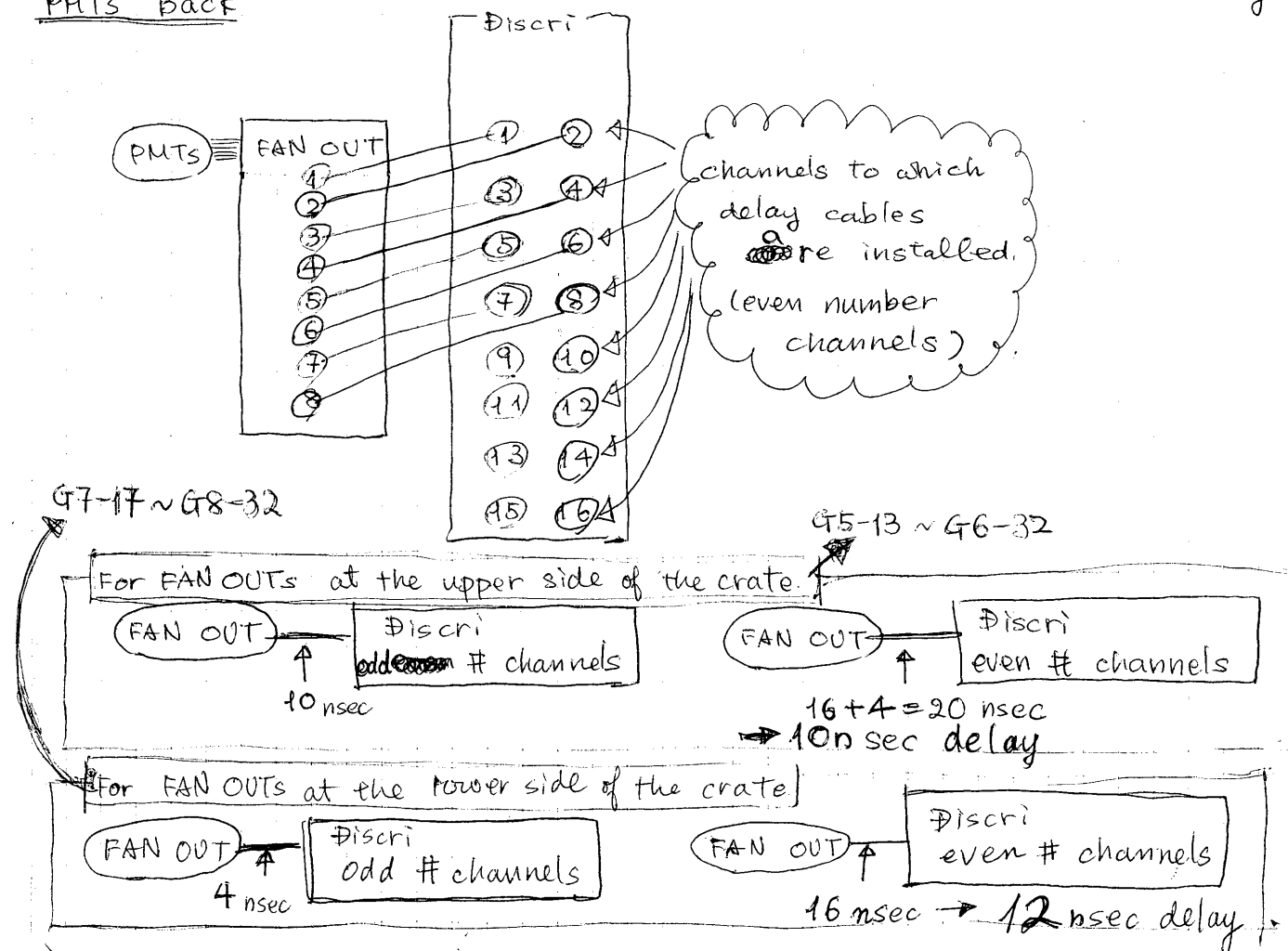
stopped 18:46

By AB, AP, YH

PMTs Front



PMTs Back



18:59 * RUN # 5637 pedestal @ beam ON.
 19:18 RUN # 5638 LED @ beam ON.
 19:31 RUN # 5639 alpha @ beam ON
 19:59 RUN # 5640. S1 * NaI * Liq. Xe 4center RMTs trigger rate.

I have finished tuning the beam since the ASLS1 is now fixed but the calibration maybe different. Therefore the settings over the weekend may not have been optimum since the ASC was set to give same ADC value (current)

I use DS1 threshold = 850mV for optimization (cutting into π^- but really only π^-)
 use $S1_{\pi^-} RF$ initial Rate $S1_{\pi^-} = 1.07 M/10^5 p$
 $S1_{\pi^-} RF = 908 k/10^5 p$

after optimization ON S1
 $S1_{\pi^-} RF$
 ASL = -11529 ADC = -0.1739
 QSL53 = -563
 QSL54 = 868
 $S1_{\pi^-} = 1.14 M/10^5 p$
 $S1_{\pi^-} RF = 969 k/10^5 p$ } DS1 = 850mV
 $S1_{\pi^-} = 1.40 M/10^5 p$
 $S1_{\pi^-} RF = 1.04 M/10^5 p$ } DS1 = 600mV Normal setting

→ these settings updated to Beam file Meg111piS1.set

Now optimize on $S1_{\pi^-} RF \cdot \gamma(NaI)$

initial $S1_{\pi^-} RF \cdot \gamma \sim 259/10^5 p$

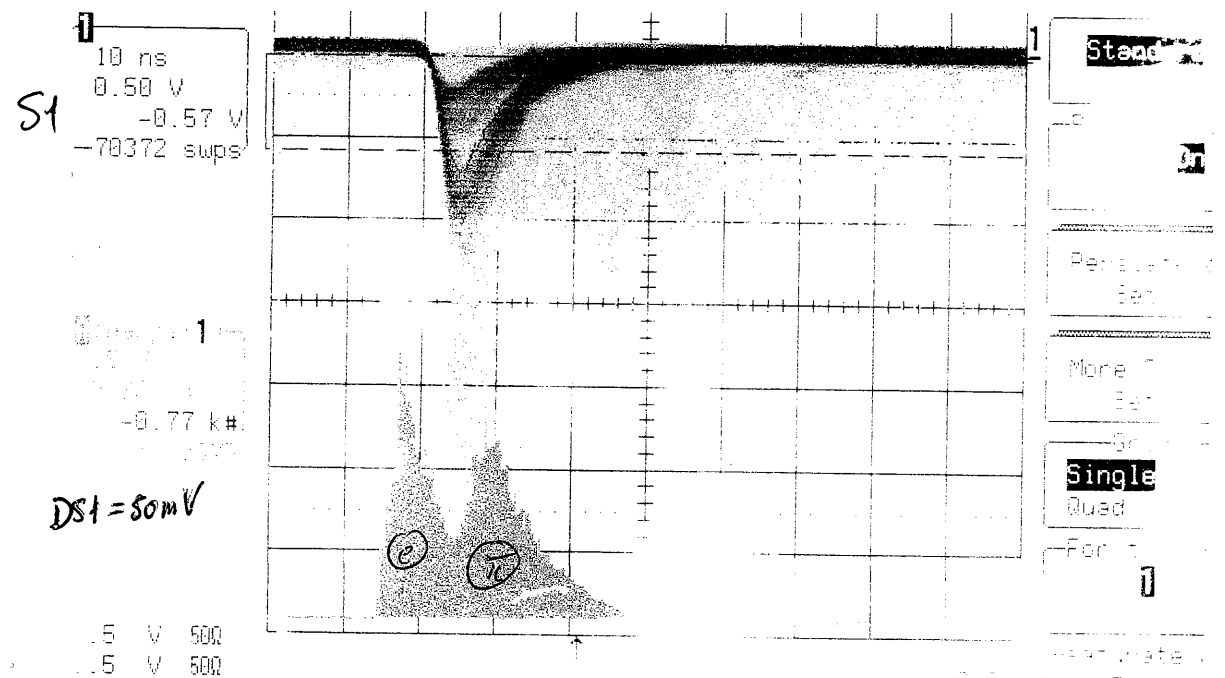
After optimization on γ 's
 $S1_{\pi^-} RF \cdot \gamma(NaI)$
 ASLS1 = -11471 ADC = -0.1731
 QSL53 = -558
 QSL54 = 848
 $S1_{\pi^-} = 1.31 M/10^5 p$
 $S1_{\pi^-} RF = 1.08 M/10^5 p$
 $S1_{\pi^-} RF \cdot \gamma = 312/10^5 p$

Actual Settings -- Wed Oct 22 19:12:30 2003

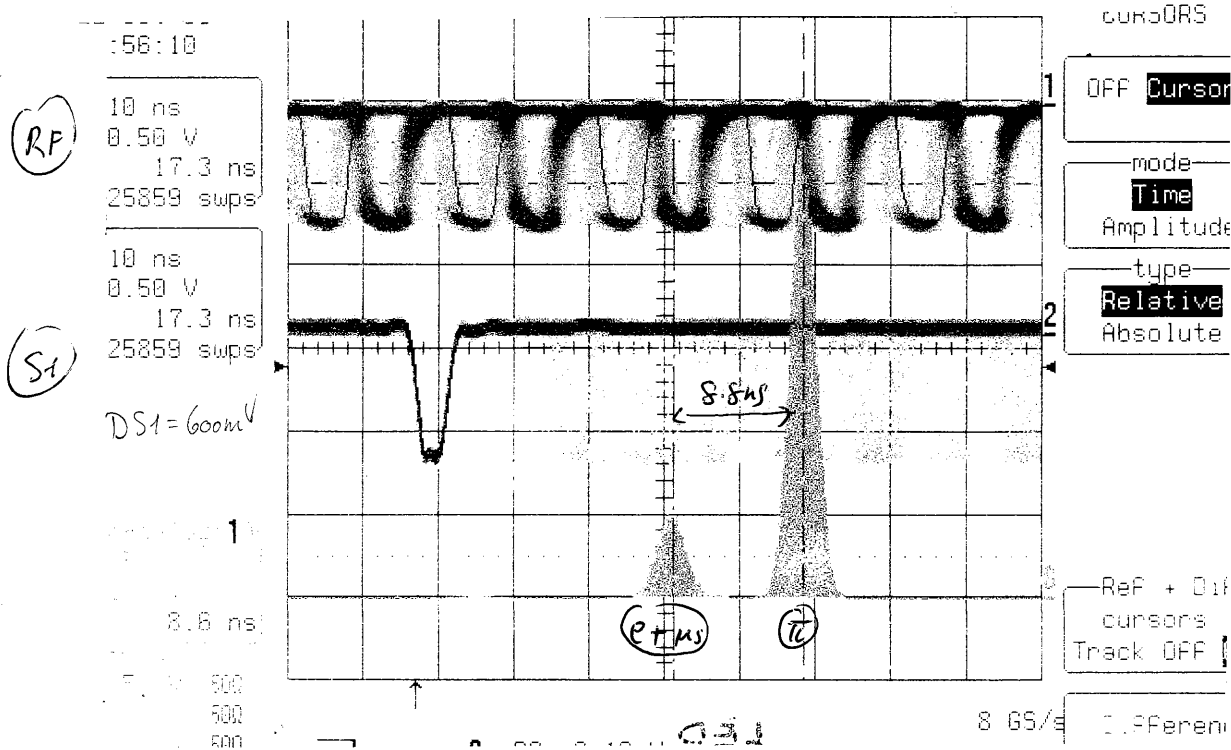
Device	DAC	ADC	Scaling
QTH51	1282	0.3099	1.0
QTH52	-652	-0.1563	1.0
QTH53	0	0.0000	1.0
ASZ51	-2755	-0.2020	0.3
QTB51	575	0.1390	1.0
QTB52	-294	-0.0694	1.0
ASY51	-685	-0.1641	1.0
QSL51	-551	-0.1355	1.0
QSL52	1000	0.2437	1.0
ASL51	-11471	-0.1734	1.0
QSL53	-558	-0.1355	1.0
QSL54	851	0.2046	1.0
SSL51	0	0.0000	1.0
SSK51	0	0.0000	1.0
FSH51	110	0.2757	4.1
FSH52	350	0.3492	4.1
DSC51	0	0.0567	4.1
DSC52	370	0.3636	4.1
FS53-O	500	0.5009	4.1
FS53-U	500	0.5009	4.1
FS53-L	100	0.0972	4.1
FS53-R	100	0.0994	4.1

New file optimized on $S1_{\pi^-} RF \cdot \gamma(NaI)$
 ⇒ Meg111piS1.set

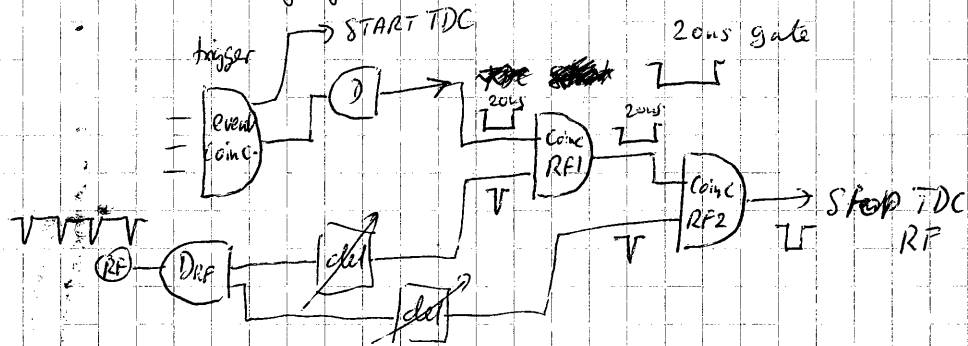
one should NOT alter ASLS1 now



Equivalent TDC RF Spectrum



The timing for TDC RF Spectrum should be made as follows



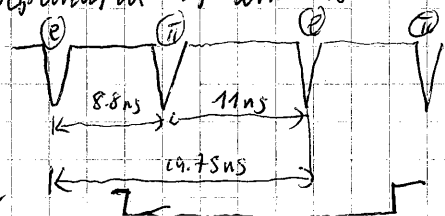
Coinc RF1 makes Coincidence between trigger (S1, ...) & RF within a 20ns wide gate $\approx 1 RF$ period

Coinc RF2 makes time timing made by RF for TDC this should

Cut-down filter between S1 & RF

— one has to select the delay carefully such that the window of 20ns is placed to give max separation for e⁺ / e⁻

if separation as above is $\sim 9ns$



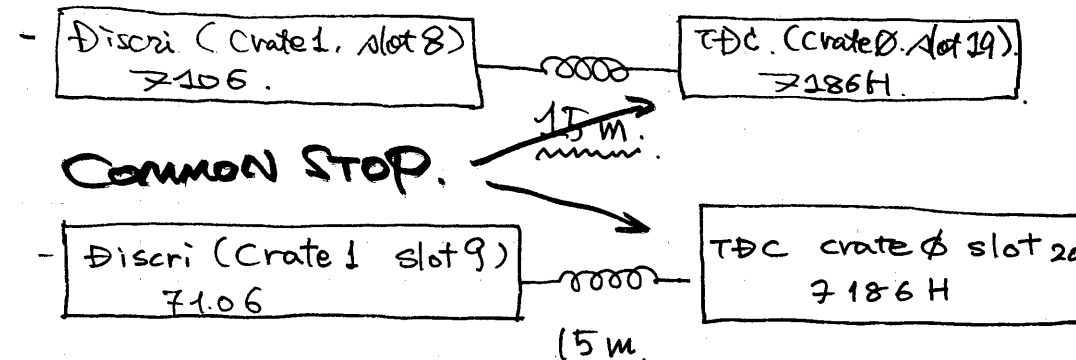
e.g. Place window here

DS1 threshold set to 600mV again all cables should be as before !!!

22/02/2003.

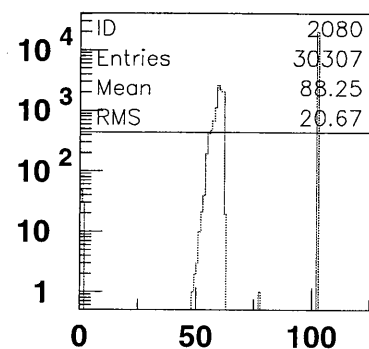
21:48 Stop the RUN #5640. ~ 15000 events taken.

• New TDC delay cable (15m) is installed.

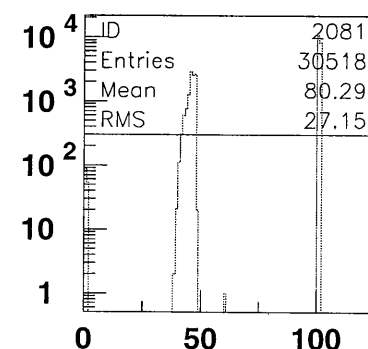


• We carried out the test RUN.

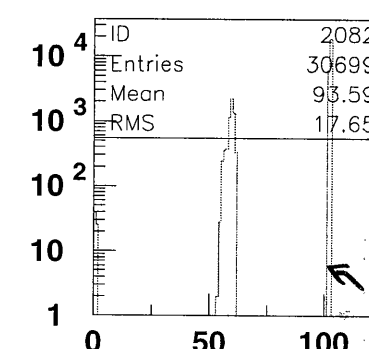
OK! as Common Stop mode.



TDC BK20



TDC BK28



TDC BK14

• We also checked another TDC module, individually. Since we have 1 15m delay cable.

These overflow events ~~are~~ has no problem.

➔ All CAMAC TDC modules work well!

• New 15m delay cable is installed Discr1 (crate 1, slot 9) \leftrightarrow TDC (crate 0, slot 20) now.

23/Oct./2003.

NaI A1 (CAMAC CRATE 01 slot 12 - 0 channel)
was noisy. (two peaks in the pedestal run.)
→ replaced to slot 17 - 8 channel.

02:06 #5641. pedestal run @ Beam ON.
#5642. LED run @ Beam ON.
#5643. α run @ Beam ON.
#5644. Pio run @ Beam ON 1.8 mA
S1. NaI. Xe center 4

06:35 #5645. π^0 RUN. same as previous condition.

7:47 RUN Paused for replacing nitrogen dewar
Circulation stopped.

7:51 RUN Restarted after restarting circulation
flow rate 9.24 lpm

7:33 "Error writing to archiveftp"
Because of this RUN #5645 stopped

7:53 #5646 π^0 RUN same as previous RUN condition
TRIGGER RATE 2.5 Hz
Very short and no RF data (TDC)

8:03 FOUND THAT RF & S1 TDC data are not filled
in the histograms. RAW data for these channels
are always same values.

STOP the RUN

Source code was checked and the clear functions
for the TDC module is found to be called only 1 time.
this must be called twice as studied on 21/10 Oct.
FAL recompiled and tested → OK.

23/Oct/03

8:24 #5647 π^0 RUN

S1 * NaI. Xe center 4 same as RUN #5644
TRIGGER ~ 2.5 Hz 1.8 mA proton current.

10:46 RUN END

re-run optimization
ASC = -11471 (-0.1731/34) } SAME
QSCS3 = -558
QSCS4 = 840 changed

N.B. threshold DSI changed from 600 mV → 620 mV (post)

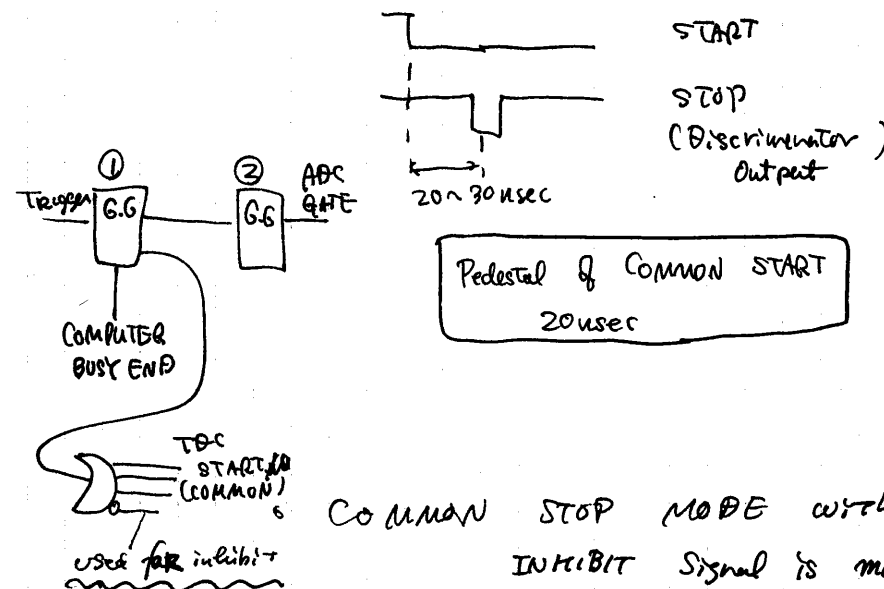
CAMAC TDC delay cable study by SM, HN

- NIM-ECL, ECL-NIM module is found to be partially broken.
ECL → NIM works while NIM → ECL not.

- using 30m delay cable (15m + 15m) two possible schemes are tested.

- COMMON START
- COMMON STOP with inhibit signal

o COMMON START MODE



Because there are pedestal of 20 nsec wide, we fail to take some events in this mode.

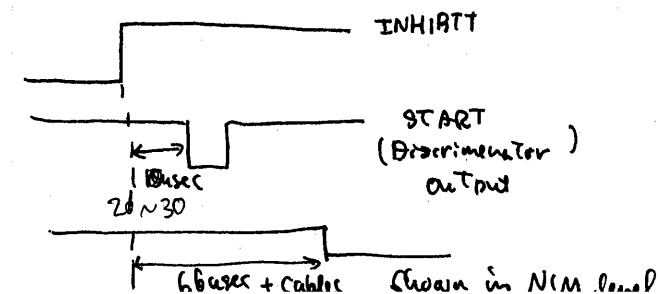
histograms are shown in the next page 5 pages later.

BK 14, BK 23.

BK 23 has longer delay cable than BK 14

COMMON STOP MODE with inhibit signal

INHIBIT signal is made from the G.G. ① output and the STOP timing (COMMON signal). was made by delaying the original start signal by 66 usec

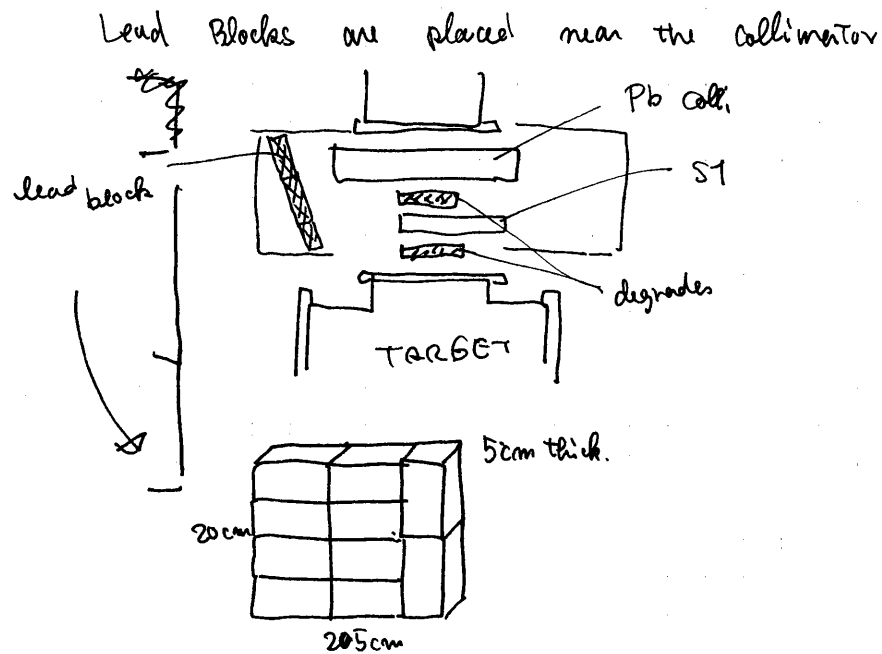


Histogram is shown in the next page 5 pages later.

14:06 #5648 ~~run~~ π^0 RUN with S1 threshold -620mV

~ 2.5 Hz

#5648 STOP. 6606 events



15:16	#5649	Pedestal	beam off
15:18	#5650	LED RUN	beam on
15:25	#5651	α RUN	beam on

30000 events

15:32 π^0 RUN #5652
TRIGGER RATE ~ 3 - 3.4 Hz

16:11 stopped run run stopped suddenly without pushing stop button. ~ 2500 events

16:38 #5653 π^0 RUN some DAQ bug???
re-start.

16:55 run stopped ~ 790 events

For run #5652 and #5653 we have: "Error writing to archivftp, stopping run"

17:07 π^0 run #5654 started

17:28 run stopped ~ 790 events

17:30 π^0 run #5655 started

17:48 run stopped

~ 780 events

17:50 π^0 run #5656 started

18:00 Finished tuning for today. The idea was to see if the focus @ the degrader could be optimized for γ 's from LHe by using either NaI or LP LHe γ -signals only - since if you include S1 the spot size for the Counter as you defocus @ S1 to produce a focus further downstream your optimization rate would also fall i.e. you could reach a better focus downstream with S1 in coincidence.

Option 1: Using LP 4 signals from ~~LP~~ Linear FIFO

optimized values:
thresh \times 230mV

ASLS1	= -11478
QSLS3	= -558
QSLS4	= 847

Saved to Meg111.p.s1g

Option 2: NaI signal:

ASLS1	= -11465
QSLS3	= -558
QSLS4	= 850

Conclusion: All times give clear maximized rates @ ~ same values
i.e. Tuning doesn't look as though it will bring much more.

We should try tomorrow to empty LHe - target tube data with empty target to study background from target cell/vessel & confirm that the peaks we see corresponding to Tc^0 decay disappear !!!

Then re-fill target from O-state i.e. Hotly Warmed-up

Present rates

S1 π	1.305 M/10 ⁵ p	= 0.562 Sec @ 1805 μ A
S1 π .RF	1.08 M/10 ⁵ p	
S1 π .RF. δ	499/10 ⁵ p	

18:08	#5656	stopped	787 events
19:08	π^0 run #5657	started	
19:28	#5657	stopped	787 events
19:29	#5658	started	
19:46	"	stopped	788 events
19:46	π^0 run #5659	started	
19:02	"	stopped	788 events
19:02	π^0 run #5660	started	
19:20	"	stopped	788 events
19:23	π^0 run #5661	started	
19:40	"	stopped	788 events
19:42	π^0 run #5662	started	
19:58	"	stopped	788 events
19:59	" #5663	started	
20:15	"	stopped	788 events
20:18	π^0 run #5664	started	
20:35	#5664	stopped	788 events
20:38	π^0 run #5665	started	
20:54	"	stopped	788 events
20:56	π^0 run #5666	started	
21:12	"	stopped	788 events
21:14	π^0 run #5667	started	
21:33	"	stopped	787 events
21:34	π^0 run #5668	started	
21:50	"	stopped	788 events
21:51	π^0 run #5669	started	
22:04	"	stopped	
22:08	π^0 run #5670	started	

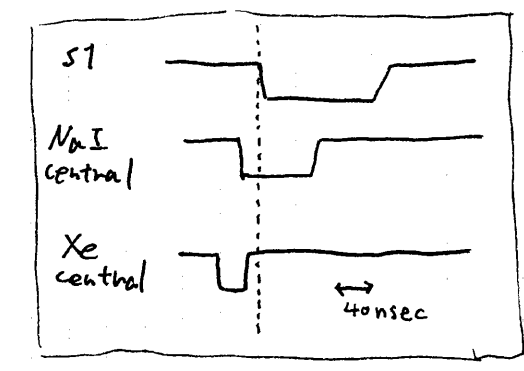
NO GOOD RUN many times. preparative system fault, we stop to write the data to archiveftp from #5670, so we need to transfer data to those system manually later.

23/ Oct / 2007
 23:43 stop 5670 4578 events
 23:44 #5671 pedestal beam on
 23:45 #5672 LED beam on
 #5673 LED
 #5674 "
 #5675 "
 #5676 * stopped on the way

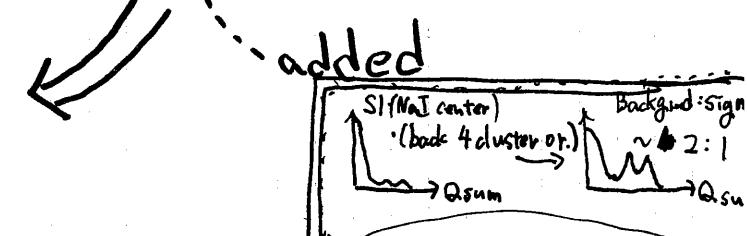
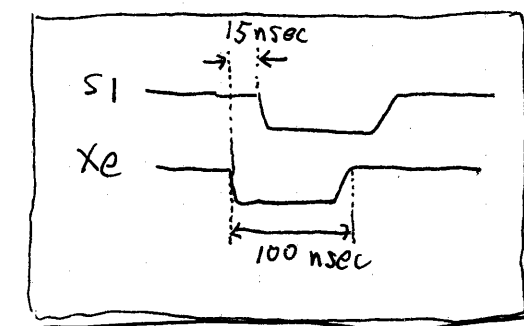
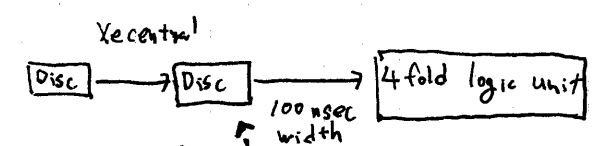
⇒ these runs started by FALC(?) Automatically. why
 ↑
 This is because automatic reset was enabled by SR
 See ELOG on 23/Oct/03

0:13 #5677 α beam on
 #5678 test run
 1:15 circulation stop
 change LN₂ 100l → 100l
 circulation restart

checked ~~the~~ timing at 4 fold logic unit for π^0 trigger



⇒ added discriminator for Xe central



It is necessary to check if signal is also reduced or not

changed MIM Discriminator th for back clusters to -75 mV to require two PMTs for each cluster ⇒ Background events are reduced.

24/Oct/2003

2:54 .ftp write switched on

5679 SI (NaI center) (Xe center)

11:23 RUN #5679 end 86922 events

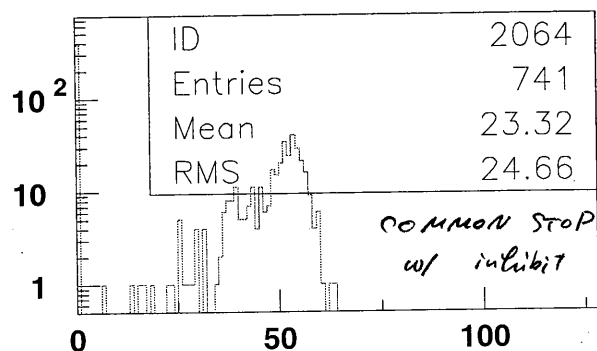
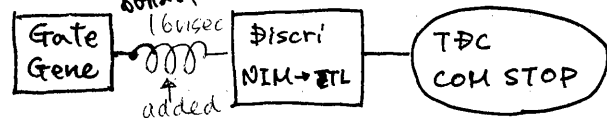
Calibration.

11:24 #5680 Pedestal ~5000 events
 #5681 LED
 #5682 LED again (automatically started)
 #5683 LED stopped (")
 #5684 d
 #5685 SI * NaI center * Lig. Xe center

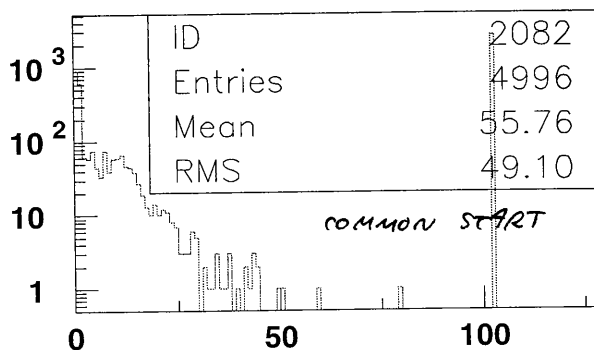
Beam on

TDC Setup has been done
 Terminators are plugged in

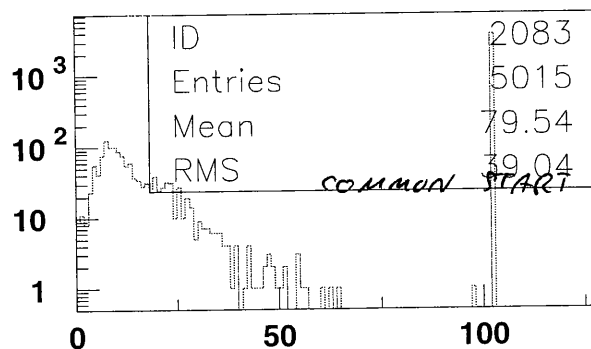
Signal for TDC Common Stop is delayed. (16usec)



TDC T38



TDC BK14



TDC BK23

23/Oct/03

CAMAC TDC delay cable study using 30m delay cable

#5686 SI * NaI center * Lig. Xe 8 clusters.

24/Oct/03

12:20 RUN Paused. ← Beam has been stopped for 1 hour.
 Threshold for backside

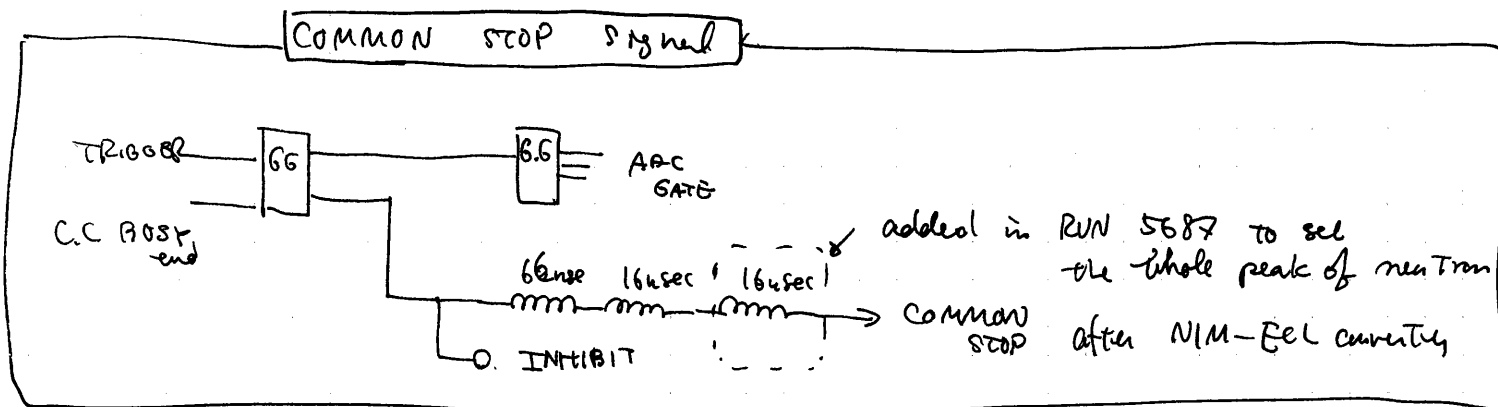
Beam is back? 1304uA (12:41) stopped at 12:26

12:40 #5687 Same as #5686

Neutron peak in TDC of BK17 (histo ID = 2085) ?!

RUN stopped to add another delay for common STOP signal to see the peak totally.

12:52 #5688 Same as #5687 but with additional delay cable (16msec) for common stop signal



13:42 Circulation stopped change LN2 100L → 100L

13:55 Circulation resumed.

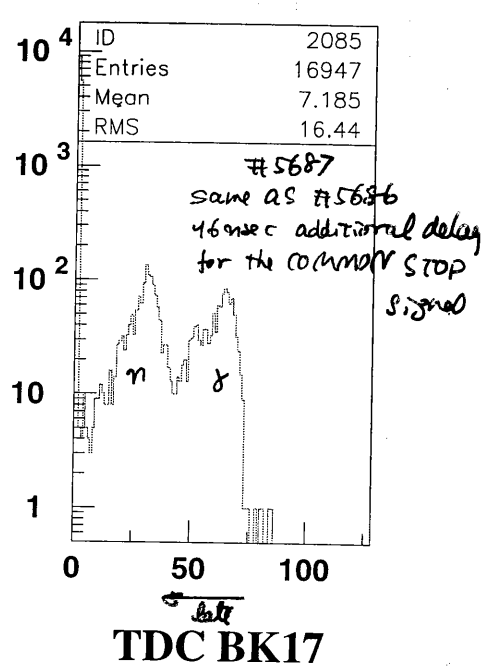
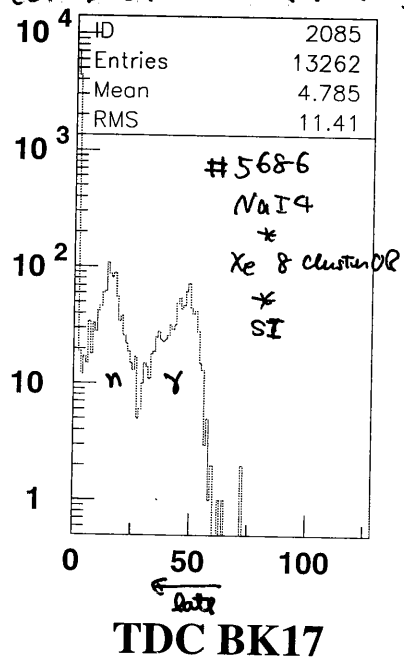
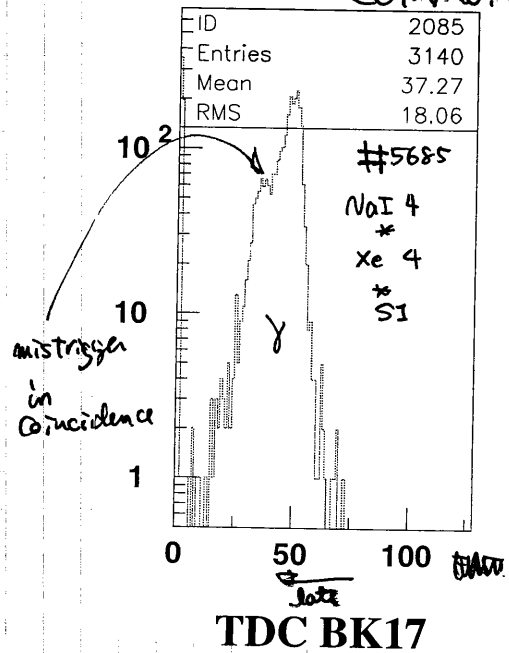
14:11 circulation stopped, 14:51 circulation resumed

Preparation for empty target RUN 13:40 ~ 14:00

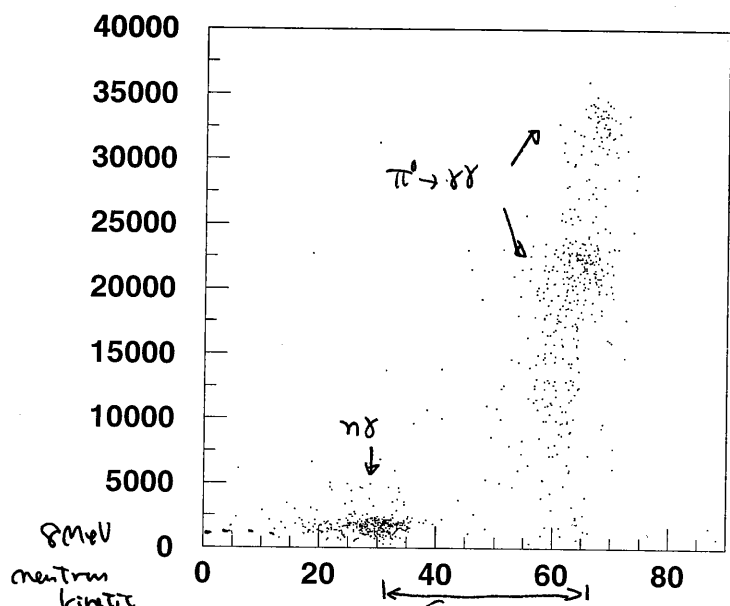
- STOP the compressor for the target cell
- Temperature target value is set to be 200K.

24/Oct/03

COMMON STOP MODE OPERATION



We really see neutron in LP xenon detector!



TOF difference between γ from π^0 & n from $n\gamma$ ~ 30 nsec

- 15:10 circulation stopped again and restarted later.
- 17:17 #5689 pedestal @ beam OFF
- 17:21 #5690 pedestal @ beam ON
- 17:23 #5691 LED @ beam ON
- #5692 LED automatically started and stopped by hand.
- 17:31 #5693

EMPTY TARGET RUN

with Pi^0 TRIGGER (NaI center, Xe center, SI)

TARGET. 200K. ~ 2.0 Bar (GAS phase)
 ~ 15 events/5 minutes = 0.05 Hz
 ~ 90 events/70 min = 0.02 Hz
 ~ 145 events \Rightarrow 0.022 Hz

19:17

25/ Oct/2003

- 0:52 ~~stopped~~ #5693 is stopped
- 1:55 #5694 pedestal 625 events/441 min ~ 0.024 Hz ~ 5000 events
- 2:00 #5695 LED
- #5696 LED started automatically stopped intermediate ~ 30000 events
- 2:12 #5697 alpha ~ 30000 events
- 2:40 #5698 same as #5693
- 5:16 HV down.
- 8:53 stop 5698 446 event
- Found that HV for LHe was down since 5:16.
- 9:10 #5699 start. same as #5693

25/Oct/2003

9:20 #5699 stopped (to replace LN₂ dewar).

Circulation stopped.

10:00 Restart the circulation.

#5700 start. same as before.

13:56 #5700 stopped ~300 events

NG calibration
Don't use this calibration.

14:06 #5701 pedestal ~9000 events

You must use previous Calib. -data.

14:08 #5702 LED ~50000 events

14:15 #5703 LED Starts automatically.

→ Stopped intermediate

14:16 #5704 π^0 trigger (NaI center * LXe 8 cluster * S1)

trigger rate: 156 events / 60 sec ~ 2.5 Hz

15:32 #5704 stopped ~10741 events

15:40 beam shutter closed.

15:45 #5705 π^0 Trigger (NaI center * LXe 8 cluster * S1)

only accidental coincidences, hopefully none, could provide triggers.

15:55 #5705 stopped (0 events in 10m 00s) OK!

beam shutter opened

15:58 #5706 start (NaI center * LXe center * S1)

event rate: 30 events / 20 min = 0.025 Hz

* Got the error "fal.exe the instruction 0x004fcf0c referenced memory at 0x7165676b". the memory could not be "written".

* The run is no longer logging data but it is still alive. We can't stop it, we can't restart it!

* The "NIDAS status" link to Internet explorer is waiting for a replay that doesn't arrive.

* Ctrl-Alt-Del is masked?! I can't see which are the running processes.

* Hajime solved the problem: he stopped the net, reloaded the database, and restarted SCFE and FAU!

19:07 #5707 (Not center * LXe center * S1)

Counting rate ~ 80 events / 1 hour ⇒ ~~XXXXXXXXXX~~
~ 0.0222 Hz.

22:02 #5707 stopped

~~lig N₂ dewar exchanged level at 100%~~

22:17 #5708 started.

⇒ Counting rate

~ 0.02 Hz

26/Oct/003. ⇒ Counting rate doesn't change.

~ 0:00 Beam stopped!

0:35 Beam is back.

1:01 Stop the RUN #5708

Stop Circulation.

LN₂ Empty

① We inserted 12mm thick Al. plate between the target and the degrader.

② The pressure of the lig. N₂ dewar was found to be 4 bar!

Beam Intensity has been reduced. (because of open day).

1.5A

26/Oct./2003

01:00 ~ 02:00

We remove Marco's new degrader (see comment of RUN #5708)

LN₂ tank exchange. 100l → 100l.

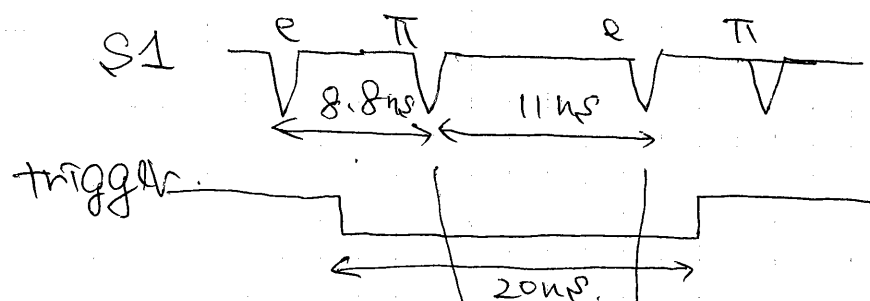
We evacuate the Target cell by RF → ~~XXXXXXXXXX~~

2:00 Circulation restart.

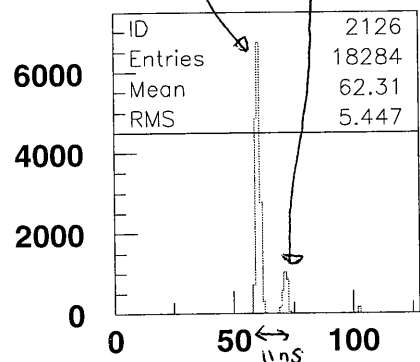
3:00 Summer Time finished. 03:00 ⇒ 02:00

2:00 Again!

RF signal into TDC modified as Peter suggested (see this lognote of 22/oct/2003) to get better (e, μ) and π discrimination.



• diagram also shown in that Peter's log.



TDC RF

^{only} S1 triggering data sample

clear (e, μ) & π discrimination demonstrated!!

26/Oct./2003

02:26 RUN #5709 - π o RUN with blank target.

Trigger: S1 * (NaI 4) * (Xe 4).

Counting rate: 60 events / 170 min. = 0.04 Hz.

14:05 RUN # 5709 stopped at 13:29 with 539 events "Error writing to archiveftp"

14:35 # 5710 ~~test run~~ test run to check signals from Xe back central 2x2 PHTs.

BK 12	(8650)	✓
13	(11730)	✓
18	(8600)	✓
19	(2300)	✓

... NOISY ⇒ connector to the ~~detector~~ divider was broken.

Connector fixed by H.N.

but STILL NOISY

15:50 # 5710 stopped

15:57 # 5711 pedestal

15:53 # 5712 LED

16:10 # 5713 LED

16:23 # 5714 π o trigger (S1 * {NaI 4} * {Xe 4})
30 events / 20 min ~ 0.025 events

NG calibration (LED unstable) Do Not use this. ~ 5000 events

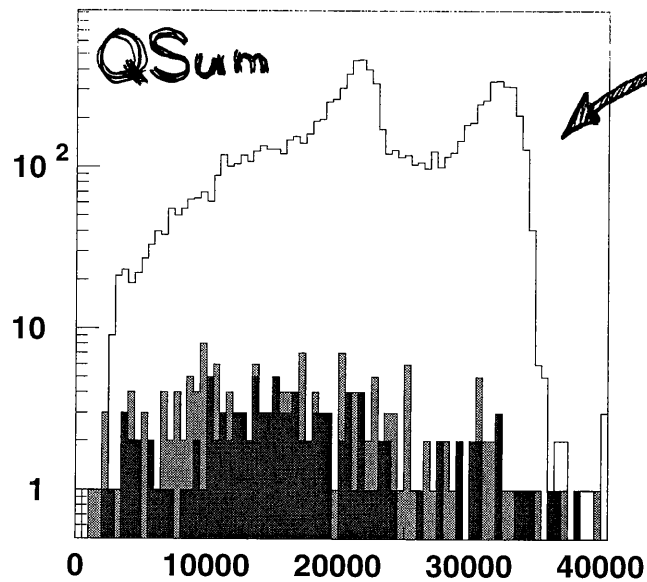
~ 30000 events

~ 30000 events

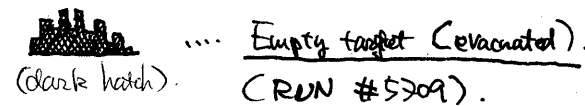
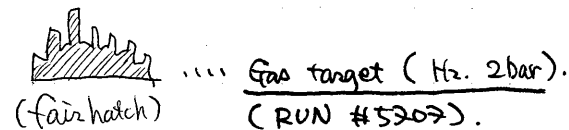
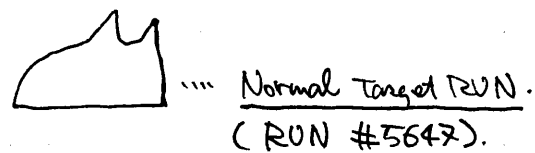
26/Oct./2003.

Background measurements Summary. HW.

● We carried out the background measurements in this weekend.



QSum spectra corresponding to 3 kind of measurements.



- All the spectra are normalized by RUN-time as 2.5 hours.

- Triggering rates are as following:

- ▶ Normal target ... ~ 1.2 Hz.
- ▶ Gas target ... ~ 0.023 Hz.
- ▶ Empty target ... ~ 0.014 Hz.

18:43 #5214 Stopped.

LN₂ empty. \rightarrow Correlation STOP.

replaced 100e \rightarrow 100e.

18:53 Correlation restarted.

19:04 RUN #5715 start, = π^0 run with blank target.

with new Trigger Logic.

(S1) * (NaI center 4) * (Xe center 4 of front center 4 of back).

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19:04 Beam come back to full power! ~ 2 mA.

With the new trigger the background rate is 441 events in 228 min = 0.032 Hz

4:10 #5716 pedestal run with beam on

4:10 #5717 LED run @ beam ON \leftarrow bad calibration run.

4:49 #5718 alpha run @ beam ON

4:55 #5719 LED run @ beam on

~~4:55 #5719~~ (S1) * (NaI center 4) * (Xe center front 4 center back 4)

5:10 #5720 π^0 trigger with blank target.

229 events / 120 min ≈ 0.032 Hz

\rightarrow stopped @ 10:15 w/ 579 evts.

~~10:15~~

10:21 #5721 (Xe central ~~front~~ front 4 & on central back 4) self trigger proton current 1777 μ A

trigger rate request 172 Hz accepted 70 Hz

stopped @ 10:30 w/ 3×10^4 evts

10:46 #5722 (Xe 8-cluster) only to see all kinds of BG

trigger request 22.6 kHz accepted 140 Hz

proton 1766 μ A

11:13 #5723 (Xe 8-cluster) only, beam off.

trigger request 6 kHz accept 134 Hz

11:20 Correlation Stopped - LN₂ almost empty Target status cell empty

11:25 Circulation resumed,

12:12 # 5724 pedestal w/ beam off

5725 LED "

13:05 # 5726 alpha "

Leak tests in Target system WO MG SY. AP

✓ test between target cell & insulation vacuum

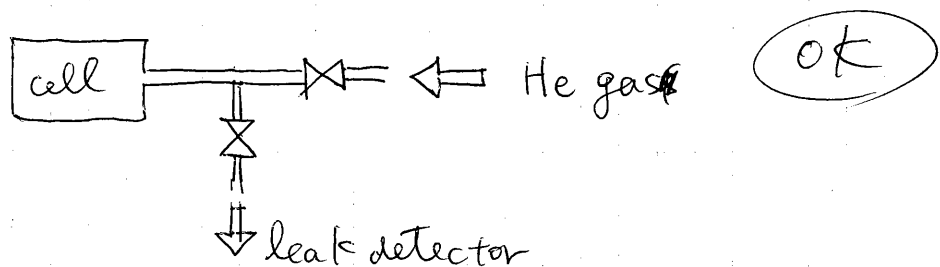
No leak above $\sim 10^{-9}$ mbar l/s (OK)

✓ Test between insulation vacuum & outside the chamber

No leak above $\sim 10^{-7}$ mbar l/s (OK)

apart from the leak through the Kapton window

✓ test ~~between~~ of the safety valve



Measure leak level by filling the cell

with He gas up to 1.97 bar (abs)

➔ No leak detected up to 1.97 bar

★ the safety valve seems controlled by absolute pressure. (not differential)

14:40 Start ~~to~~ pre-cooling of Target cell.

(He pressure 1.45 bar).

27/Oct/2003.

15:09. RUN #5727. He RUN with cooling GAS target.

- Trigger : Si * (NaI central 4) * (Xe front 4 back 4).
- Proton beam current : ~ 1.86 mA.
- Counting rate : 27 events / 12 min = 0.0375 Hz.

15:30 Run #5727 Stop. ~ 40 events

Run #5728 pedestal ~ 5800 events @ Beam ON.

15:32 #5729 ~~LED~~ Stopped automatically - Disk Full

data files up to run #5719 copied to

E:\030927-0312-PSI7 "

15:57 #5730 ~~LED~~ LED } @ Beam ON.

15:57 #5731 Δ run.

16:10 #5732 LED run with LED #3 & #7

16:18 #5733. He trigger RUN. same as #5727.

17:15 Stop the RUN #5733. 182 events taken due to ~~LED~~ refill the He to target cell.

Refilling the Hydrogen. 2.012 bar.

(2.012/5.95) $\sim 34\%$ filled.

19:25

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19:29 Run #5734. π^0 run with Liq H₂ target.

- Trigger ~ same as previous. \hookrightarrow Now $\sim 34\%$ filled.
- Proton beam current : ~ 1.8 mA.
- Counting rate : ~ 1.0 Hz.

19:40. after taking 1790 events,
the run #5734 was stopped by archivftp writing error.

19:40 Run #5735. π^0 run with Liq. H₂ target, restarted.
same as run #5734 condition

19:50 Run #5735 stopped due to archivftp writing error.
 ~ 790 events

20:09 Run #5736 started. π^0 trigger, same as #5734
 ~ 789 events taken.

20:24 Run #5737. start. same as previous run.
789 events taken.

20:39 Run #5738 started. same as previous run
790 events taken = 1.04 Hz

20:55 Stops to refill the second third of
The target.

22:15 Target filled with another 2,000 bar
(total $\Delta P_{16l} = 4.017$ bar) target filled for $\sim 2/3$.

22:18 #5739 Started

- Trigger : same as previous.
 - Proton beam current : 1.8 mA.
 - Counting rate : 2.0 Hz.
- 4113 events / 34 min $\cong 1.99$ Hz

22:58. Run #5739. stopped.
due to fill H₂ again.

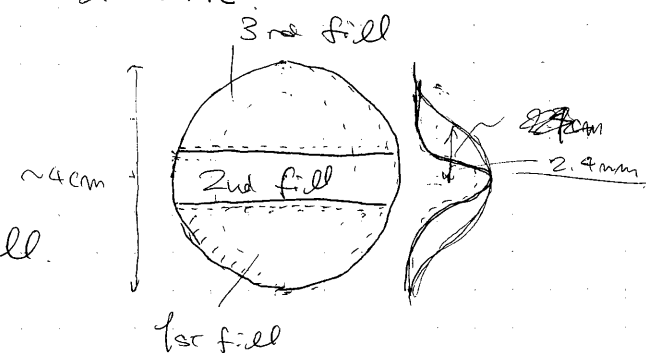
28/Oct/03

0:30 End of target fill. The cell is completely filled
beam on $T \sim 19.00$, $P_{cell} \sim 1.05$ Bar

0:32 #5740 start.

- TRIGGER SAME AS #5739.
 - PROTON 1.793 mA $S1 * RF = 1.05 \times 10^6 / 10^5$ protons
 - TRIGGER RATE ~ 3.3 Hz
- 4813 triggers / 23m35s = 3.40 Hz

- Target seems to be filled with
liquid hydrogen as can be seen in the
increasing trigger rate while we filled the cell.



- Beam profile at the cell ~~is~~ longer compared
to measured profile (vertical) before placing
the degrader. \Rightarrow need profile measurement at the target position
with degrader.

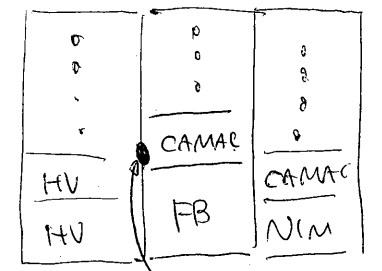
1:23 #5740 end. 10025 events.

"Broken" FASTBUS TDC. returned from PSI electronics group, is
tested again but in fail. This and the other one, too, will be

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LED light yield adjustment for taking calibration Run with different LED combination.

⚠ LED #7 connection polarity is opposite!
LED #1, 6 & #8 needs "inverter" for flashing with CAEN LED driver. But for flashing LED #7 we have to remove it.



↑ This opposite polarity should be fixed on Wednesday in order not to confuse shift crew.

around here inverters are held to the board with 3M band.

#5741 test RUN No data
2:31 #5742 pedestal RUN Beam on

2:32 #5743 LED RUN #3 & #7 For LED #7 w/o inverter.
SAME parameters for the CAEN driver with those for LED #1 & 5

2:53 #5744 LED RUN #1 & #5
#15. L14 overflow in last events
connection #3 & #7 → #1 & #5

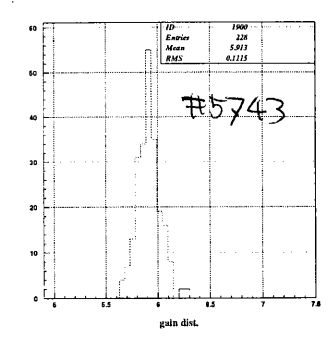
Close Beam shutter
3:05 #5745 alpha RUN @ beam OFF.

3:16 #5746 π^0 trigger @ target completely filled. Proton Current $\sim 1.5 \mu A$
TRIGGER RATE $\sim 3.0 \text{ kHz}$

This RUN should be analyzed to compare two different LED calibration RUNS #5743 & #5744.

GAHN Distribution evaluated in #5743

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#5730 (LED #1 & #5)
Mean 5.927
RMS 0.1129

LED #3 & #7

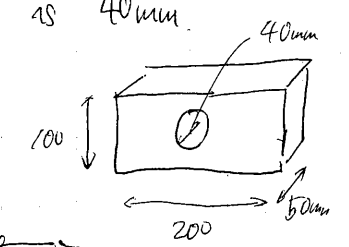
4:20 LN2 empty circulation stopped. Inner Vessel Pressure 0.433 MPa

4:25 In the middle of RUN #5746, TDC delay cables (proper length) are equipped for Backside PMTs (mainly).
CAMAC TDCs all data look to be OK.

4:49 Stop RUN #5746 17004 events Circulation stopped

5:20 Nitrogen dewar is replaced

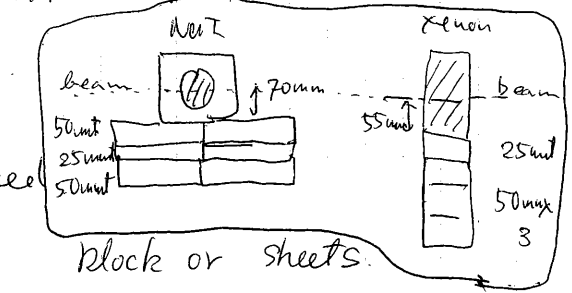
During replacing the dewar, possible ways to replace the collimators were discussed. There is another collimator, which is placed now near the NaI detector. The diameter is 40mm and the dimension is shown in the right.



For defining position more precisely on NaI side it would be better to install the dump-collimator in the NaI side and the 95mm- ϕ one to Xe side.

For doing this modification we need

- 20mm x 200mm x 50mm block or sheets.
- 10mm x 200mm x 100mm



1mm, 2mm, 3mm sheets and 100mm x 200mm (50mm / 25mm) blocks are available at the stock room
PH, TI & SM

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5:24 #5747 π^0 RUN.

This run is executed w/o circulation/purification or time to see dependence of resolutions on the circulation, and also to compare two different LED calibrations.

Trigger Rate = 7881 events/43 min. \approx 3.05 Hz

Proton Current 1.8 mA $S1 * RF = 1.05 \times 10^6 / 10^5$ proton.

8:05 #5748 Stopped \sim 30000 events

8:32 #5748 π^0 run (S1 * NaI4 * Xe 8 cluster) w/o circulation.

29900 events / 16 min \sim 32 Hz.

8:52 #5749 pedestal \sim 10000 events

#5750 Junk.

9:07 #5751 LED (#1 & #5)

9:13 #5752 LED (#3 & #7) for LED #7 w/o inverter.

9:20 #5753 α run.

9:32 #5754 π^0 run (S1 * NaI4 * Xe front 4 + back 4) 213 events / 1 min = 3.5 Hz.

12:06 #5754 stopped (\sim 30000 events)

12:09 #5755 π^0 , same as #5754

14:10 #5755 stopped manually at 23581 events

NOTE Runs 5747, 5754 and 5755 are taken in the same condition (\sim 80000 good π^0 's)

Range measurement after target refill. 28/10/03

	current	Trigger	Absorber
14:39 #5756	1.800 mA	S18(NaI) & (LXe 4 cent + 4 back)	3.3 mm Carbon (+20 mm fixed C in front of S1)

Trigger rate: 659 events in 31'14" = 0.35 Hz

*15:16 #5757 1x 3.3 mm + 20.0 mm carbon degrader
Trigger rate: 1303 events in 10'36" = 2.05 Hz*

15:31 #5758 1x 3.3 mm + 20.0 mm carbon degrader
Counting rate: 2003 events in 10'02" = 2.00 Hz

15:52 #5759 2x 3.3 mm + 20.0 mm carbon degrader.
(Note) \Rightarrow Run comment is wrong @ MIDAS, RUNLOG. This Logbook comment is right.

Counting rate: 1281 events in 6'42" = 3.19 Hz

16:05 #5760 3x 3.3 mm + 20.0 mm carbon degrader,
Counting rate: 1171 events in 6'59" = 2.29 Hz

16:18 #5761 4x 3.3 mm + 20.0 mm carbon degrader.
Counting rate: 786 events in 21'50" = 0.60 Hz

16:49 #5762 5x 3.3 mm + 20.0 mm carbon degrader.
Counting rate: 86 events in 56'35" = 0.026 Hz

Oct 29, 2003

~~Compressors are down because of cooling water failure (LXe & target)~~

Maybe some part of LXe lost \Rightarrow should be liquefied again

20mm fixed + 2x(3.3mm C) is Good

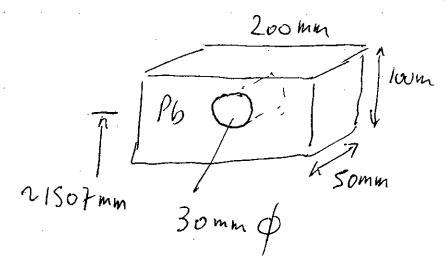
i.e. SAME as before

Degraded Range Curve 2		S _{π⁰} RF ⋅ ⋆ (NaI)		18/Spt 1		Wider NaI grade than CURVE 1	
# 3.3mm C	SAT _{π⁰} /10 ⁶ p	SAT _{π⁰} RF/10 ⁶ p	S _{π⁰} RF ⋅ ⋆ (NaI)/10 ⁶ p	[S _{π⁰} RF ⋅ ⋆ LP]	[DACP]	Time [secs]	I [μA]
2	12.587M	10.598M	4576			5.62	1810
0	12.592M	10.612M	1851	0 [0.35Hz]		5.64	1804
1 (filled?) repeat	12.581M	10.594M	3875	11 [2.05Hz]		5.64	1797
1	12.580M	10.590M	3864	13 [2.00Hz]		5.64	1802
2	12.560M	10.581M	4485	14 [3.19Hz]		5.64	1796
3	12.607M	10.624M	4203	19 [2.79Hz]		5.63	1800
4	12.592M	10.599M	1545	4 [0.60Hz]		5.55	1833
5	12.560M	10.553M	734	0 [0.026Hz]		5.51	1843
6							

We now fetch some more Pb to make a smaller collimator - then take high resolution data.

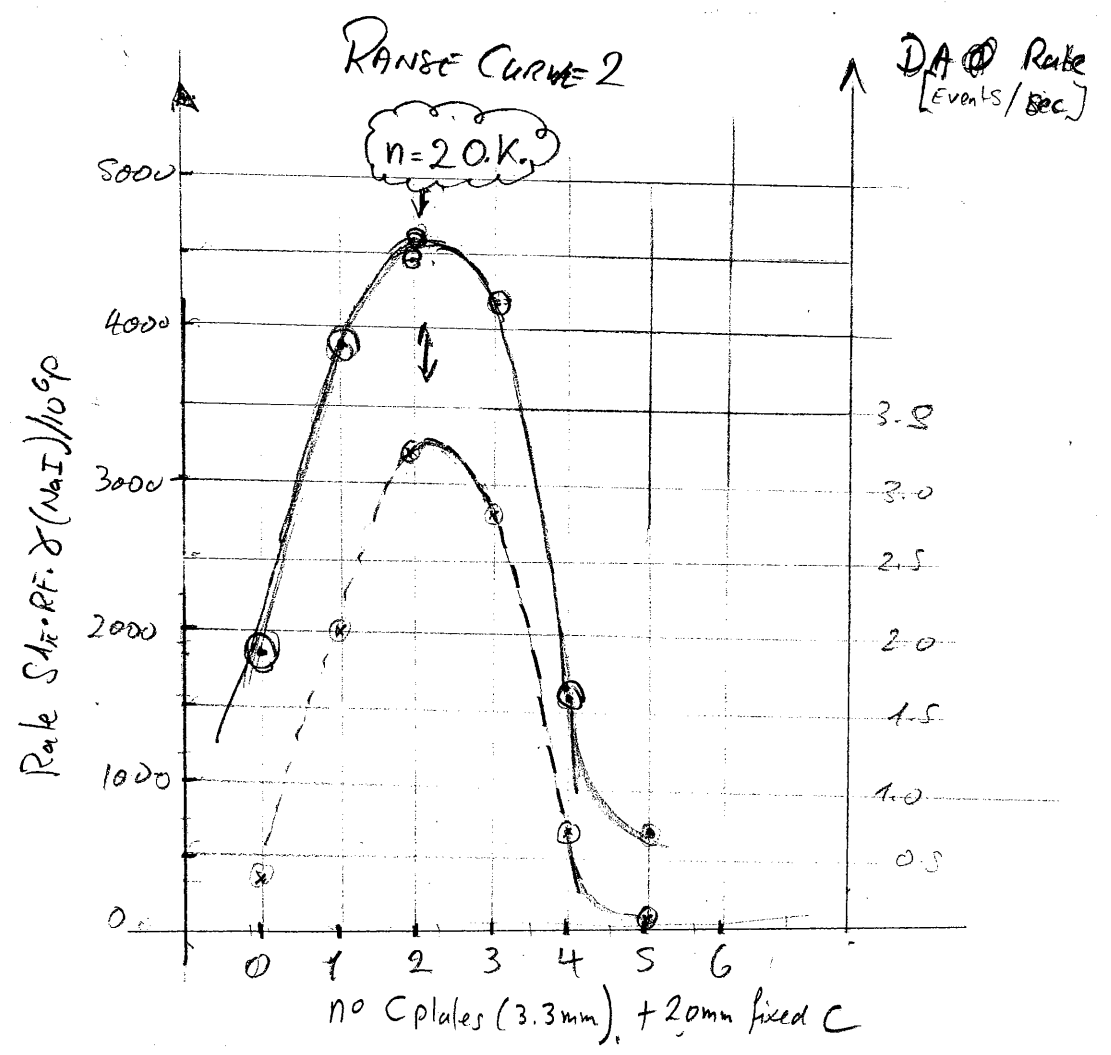
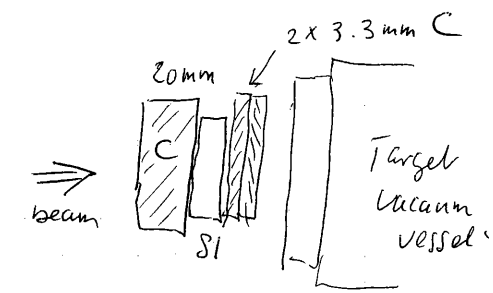
I suggest to wait with altering aperture @ Pb-wall until we have checked to beam profile again with the pill + scanner !!!

- We install



Pb collimator @ beam height IN FRONT of LP Lxe detector

replace original Degraded:



18¹⁶ Run # 5763 π^0 -trigger with EXTRA 30mm ϕ Pb collimator in front of LP - normal degrader 20mm + 2x 3.3mm C

S_{π⁰} RF ⋅ ⋆ (NaI) normal 4598/10⁶p
 trigger rate ~ 0.57Hz with aperture ~ $\frac{\pi 3^2}{4} \sim 7\text{cm}^2$
 before had ~ 32Hz for aperture (10x10)cm² = 100cm²
 ∴ expect present rate 7% i.e. ~ 0.2Hz

18³⁸ Run Stopped?

18⁴¹ Run # 5764 Started same conditions as #5763
 Stopped after 786 events taken, fep problem occurred again

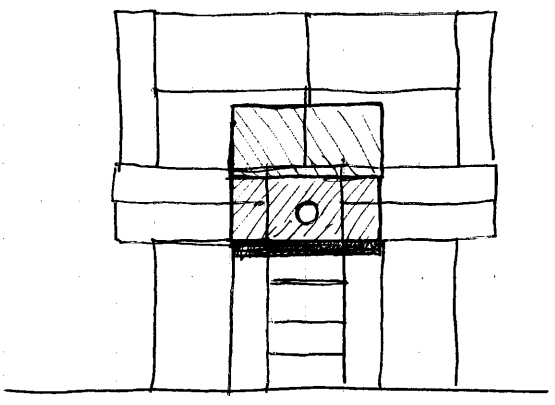
19¹⁶ RUN # 5765 ^{same} as previous setting. 786 events

19³⁸ RUN # 5766. same as before.
 RUN # 5767 same as before

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Check of the new collimator position:

Refer to 17/oct/03 for the lead wall in front to the LP



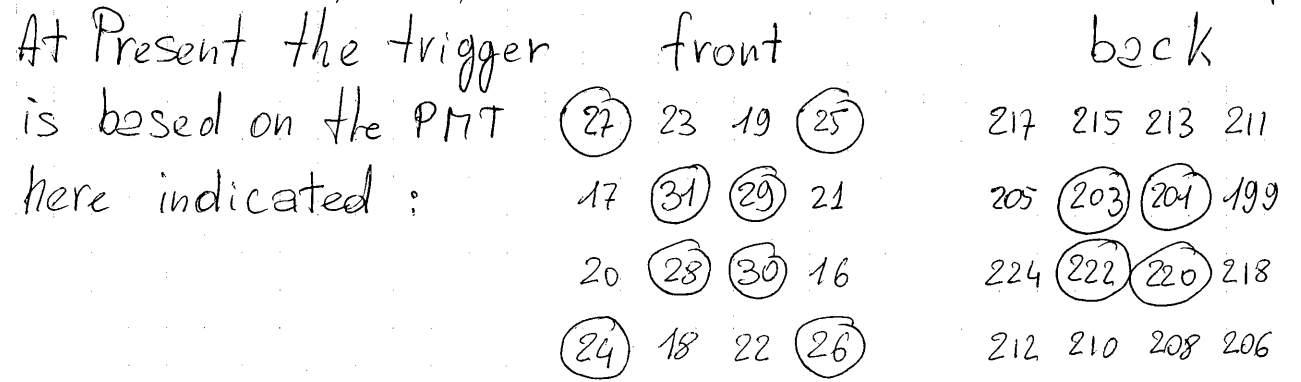
- ▨ 8mm iron spacer
- existing lead bricks
- ▤ lead brick with the 30mm hole (50mm thick along the y direction)
- ▩ further block added after run 5767 to cover

an existing aperture of 15x100 mm² (25mm thick along the y direction)

- circular hole centered on the existing square aperture
- circular hole at 1508 mm from the floor

20:50 # 5768 trigger: S1 & (4 NaI center) & (4 Xe front + 4 Xe back)
 current: 1800 μA
 rate: 619 events in 23'44" = 0.45 Hz

• LXe threshold further lowered by adding the PMT # 24, # 25, # 26 and # 27 to the linear fan-in.



21:23 # 5769 trigger: S1 & (4 NaI center) & (8 Xe front + 4 Xe back)
 current: 1848 μA
 rate: 528 events in 13'40" = 0.65 Hz

... again "error writing to archiftp..."
 automatic archiving disabled. Run must be archived by hand...

21:45 # 5770 trigger: same as 5769

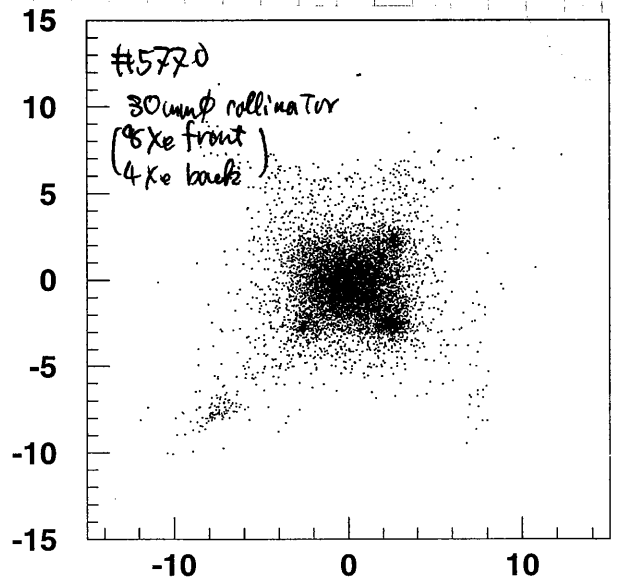
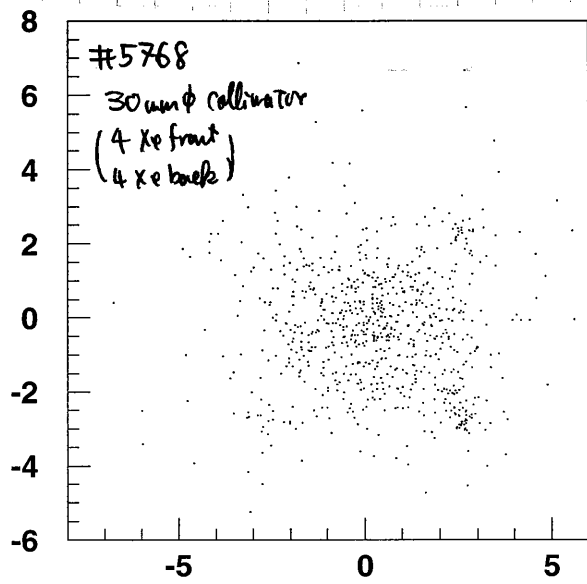
29/Oct/2003

2:12 stop 5770 ~ 10000 events 0.65 Hz
 2:13 # 5771 pedestal
 2:14 # 5772 LED ← which LED set used? 1&5 or 3&7?
 2:31 # 5773 α
 3:02 # 5774 same as 5770
 6:54 stop 5774 because of beam stop
 6:56 # 5775 CR run started ~ 3 Hz
 8:50 Two compressors (LXe & target) down!! probably because cooling water was stopped for a short time.

Maybe some part of LHe lost
 ⇒ should be filled again

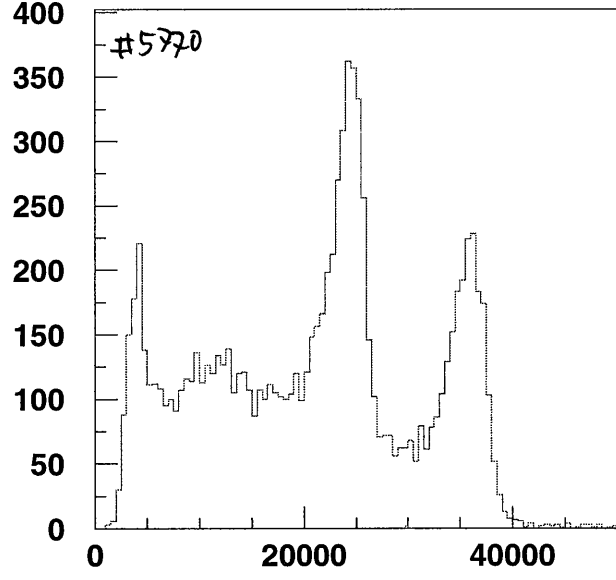
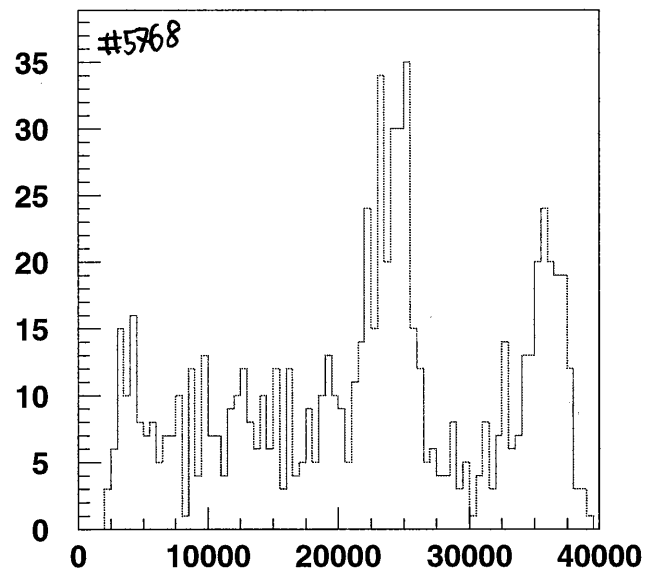
9:30 # 5775 stopped
 9:36 # 5776 pedestal beam off & circulation off
 9:39 # 5777 LED (#1 & #5)
 # 5778 alpha → strange data maybe because of bad pedestal
 maybe bad data handle with care

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Y_AVERA VS. X_AVERA

Y_AVERA VS. X_AVERA



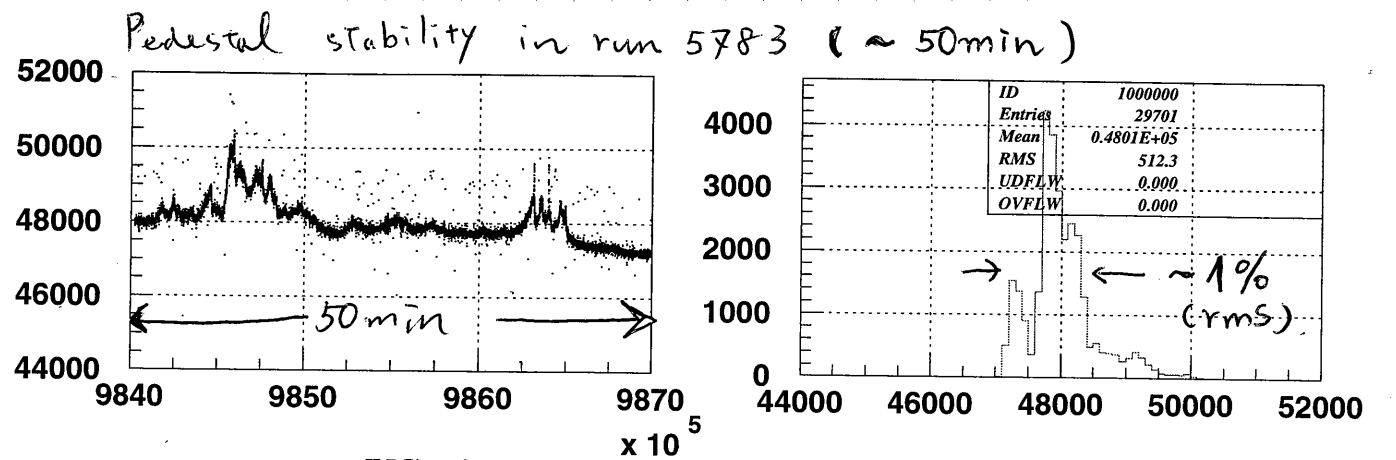
QSUM

QSUM

9:56 # 5779 pedestal w/ beam off & circulation off.
 # 5780 alpha "
 # 5781 LED (#1 & #5) "
 10:20 # 5782 CR "
 → stopped @ 11:26
 11:28 # 5783 pedestal beam off circulation off
 clock 10HZ → to see the stability of the pedestal
 Do NOT use for calibration

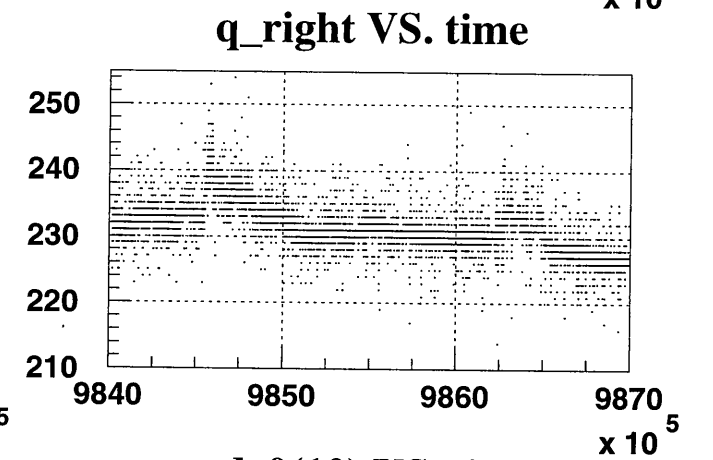
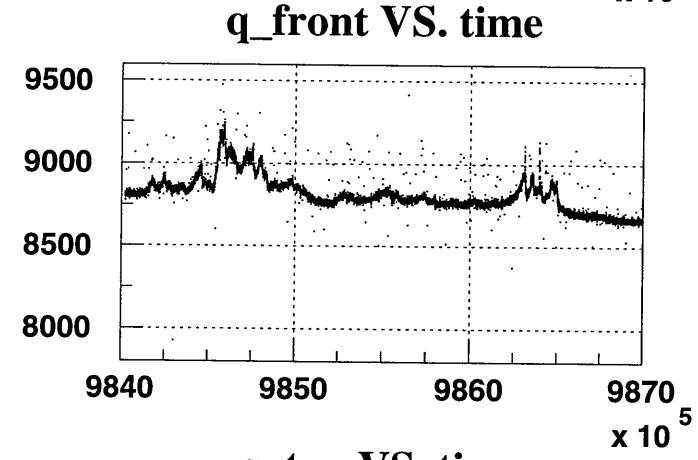
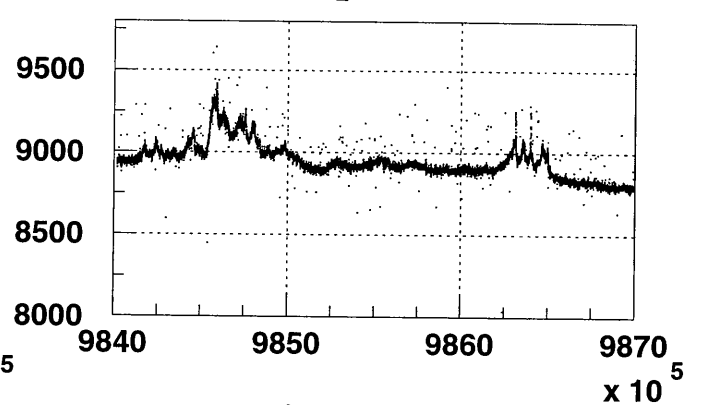
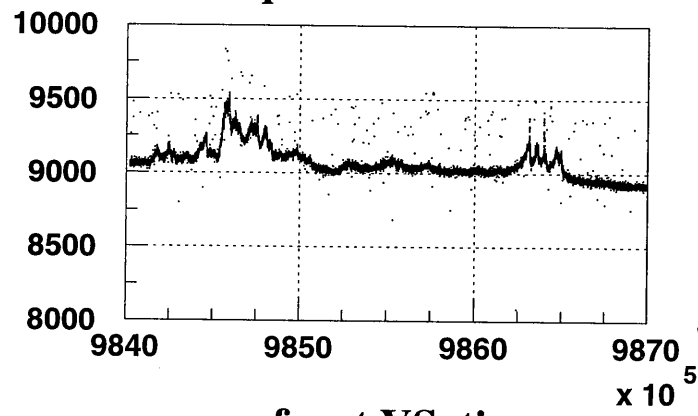
12:28 # 5784 CR run start w/ beam off & circ. off

60
2500



qsum VS. time

qsum



~~# 5785 alpha~~

would be better to introduce pedestal trigger

RMS 512.3 corresponds to ~2.5% contribution to the energy resolution for 55 MeV γ which would dominate the current resolution etc.

13:00 start regeneration of refrigerator
change control mode to temperature set point = 250K

13:00 # 5785 alpha during refrigerator regeneration } failure
5786 alpha } (No ADC gate)
5787 alpha }
TCH kept at 175.6 K
5788 pedestal during regeneration } compressor ON
5789 alpha " } heater ON (100%)
5790 alpha } compressor off
heater ON

13:30 temperature of cold head reached 250 K

13:42 # 5791 α

13:47 # 5792 α

13:53 # 5793 α

We saw instability with α run

Qsym is not correlated with
(air conditions
chane operation)
Cold head temperature

14:05 # 5794 α
switched on compressen
cold head set point = 165 K

15:00 continue temperature control mode of refrigerator.
but temperature of cold head is 170 K (set point = 165 K)
with 0% heating power.

More regenerate operation is necessary?

17:30 SR

DAQ scheme has been reworked extensively, please read ELOG for details. Procedures have changed quite a bit. Problems with PSI Archive should be fixed now.

17:00 HQ

Warm up of the H. Target has been started.
Maximum temperature 80 K, $P_{TC} = 1.846$ bar

18:36 compressor turned on -

The Bad channel Survey @ F/O outputs. by FC, AP.

upper left										upper right									
ok	ok	ok	ok	bad 3	ok					empty	ok	ok	?	ok	ok	dead			
ok	ok	ok	ok	bad	ok	low ga				empty	ok	ok	?	ok	ok	ok			
ok	ok	ok	ok	ok	low ga	low g?				empty	ok	ok	?	ok	ok	ok			
ok	ok	ok	ok	low ga	ok					bad 3	ok	ok	?	ok	ok	ok			
ok	ok	ok	ok	bad 3	ok					ok	ok	ok	?	ok	ok	ok			
ok	ok	ok	ok	ok	ok					ok	ok	ok	?	ok	ok	ok			
ok	ok	ok	ok	ok	ok					ok	ok	ok	?	ok	ok	ok			
ok	ok	ok	ok	ok	ok					ok	ok	ok	?	ok	ok	ok			

lower left										lower right									
ok	ok	ok	low ga	ok	ok	low ga	ok	ok	ok	ok	bad 3	ok	ok	ok	ok	bad 1			
ok	ok	ok	ok	ok	ok	ok	ok	low ga	ok	ok	bad 3	ok	ok	ok	ok	ok			
ok	ok	ok	ok	ok	ok	ok	ok	low ga	ok	ok	bad 3	ok	ok	ok	ok	ok			
ok	ok	ok	ok	bad 3	ok	ok	ok	low ga	ok	ok	bad 3	ok	ok	ok	ok	ok			
ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	bad 3	ok	ok	ok	ok	ok			
ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	bad 3	ok	ok	ok	ok	ok			
ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	bad 3	ok	ok	ok	ok	ok			
ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	bad 3	ok	ok	ok	ok	ok			
ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	bad 3	ok	ok	ok	ok	ok			

bad fanout (upper part) → ok.
no AMP out
Ped. 10 mV peak-to-peak
Strong reflection at 120 ns
Oscillations on the pulses tail width 40 ns period
bad 1 Unproperly terminated signal? Ground problem?
bad 2 Stronger oscillation on the tail
bad 3 Noisy ped
Very noisy signal before F/O input.

L24: This PMT is not applied HV because of HV trip. (see report on 08/Oct.)

Repair Summary. HN.

- Not dead channel of F/O. These are not applied HV, so. No signal.
 - These have noisy signal before F/O input, probably, the noisy come from PMT or feedthrough.
 - Fixed. OK.
 - F/O module is broken or ??? These modules should be replaced. I will prepare spare modules as soon as possible.
- Fixed! 29/Oct. HN