BT10 unstable connection
~~BT10 was connected to wrong ADC channel~~ → fixed

9:45 #9903 LED HV adjust
∫
#9916

changed # of event per step
1000 → 2000

#9917
∫ HV adjust
#9926

Manual set
BT10	800
T3	699
R41	765
BK23	755

⟹ save as "20051025_2.hv"

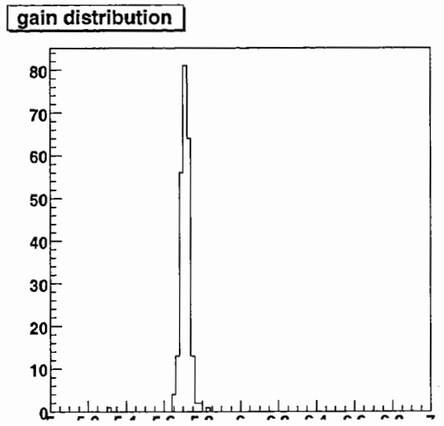
12:56 #9927 LED (w/o adjust)
file was not written properly

14:13 #9928 same as 9927
→ stopped intermidiate because of HV error
F24 714 → 704V
saved as "20051025_3.hv"

14:19 #9929 LED
* sizeof MIDAS files are always 225KB.

Restart logger

14:29 #9930 LED



15:00 #9931 α → SQL DB modified.

16:35 ▷ HV ch 1-2-3 (@ new module) doesn't seem to work.
⇒ move F9 to the reserved channel hv01.
F9
HV ch 1-2-3 (HV#215) ⇒ HV ch 0-15-10 (HV#190)
▷ R26 on HVch0-9-0 (HV#108) ⇒ HVch0-15-11 (HV#191), F24 on HVch 1-3-2 (HV#224) ⇒ HVch0-9-0 (HV#108)

17:25 Now 800V are applied for all PMTs apart from L41.
~~Stopped~~ saved as "ALL800V051025.hv"

17:29 #9935 pedestal @ 800V for all

17:32 #9936 LED @ 800V

LED	CAEN	PH
#2	ch0	(122, 126, 130, 134, 138, 142)
#6	ch5	(91, 92, 93, 94, 95, 96)

⇒ ADC saturated for some PMTs

17:42 #9937 LED @ 800V and lower intensity

LED	CAEN	PH
#2	CH0	(120. 124. 128. 132. 136. 140)
#6	CH5	(90, 92, 93, 94, 95)

18:02 #9938 LED @ 800V and lower intensity

LED	CAEN	PH
#2	CH0	(116 – 136)
#6	CH6	(88 – 93)

⇒ ~~HV~~ trip for BK8.

18:03 #9939 same as ~~#9938~~ #9938 ⇒ Junk
#9940 ⇒ Junk

18:16 #9941 LED same as #9938

18:27 #9942 LED @ 800V and lower intensity.

LED	CAEN	PH
#2	CH0	(112 – 132)
#6	CH6	(86 – 91)

#9943 ⇒ Junk

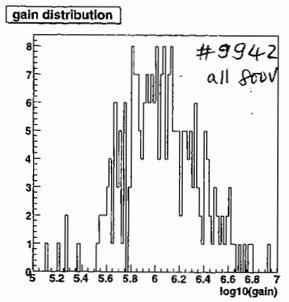
18:35 #9944 LED @ 800V and lower intensity

LED	CAEN	PH
#2	CH0	(104 – 124)
#6	CH6	(82 – 87)

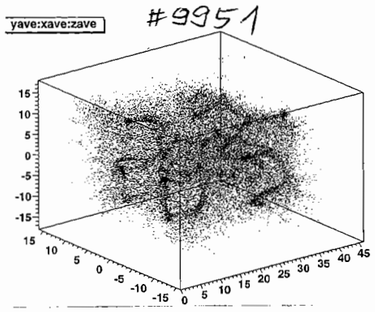
• HV for BK8 tripped.

18:48 #9945 pedestal @ 800V
#9946 Junk
#9947 alpha @ 800V 12k evts
#9948, 9949 ~~alpha @ 800V~~ ⇒ Junk
#9950 alpha @ 800V 50k evts
#9951 〃

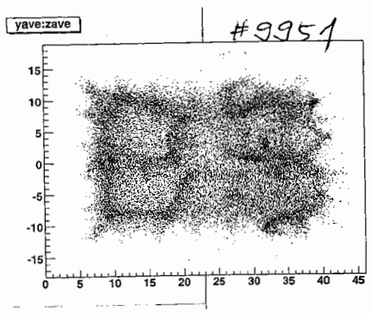
20:06



gain mean
~ 10^6 @800V



Still strange shape even with 800V



20:12 HV setting for 5×10^5 gain modified according to the change of HV-ch assignment mentioned 1 page before.
⇒ saved as "051025_4.hv"

20:15 #9952 pedestal @ 5×10^5 gain
#9953 ⇒ Junk
#9954 ⇒ Junk
#9955 LED @ 5×10^5 gain

LED	CAEN	PH
#2	CH0	122–142
#6	CH5	91–96

#9956 ⇒ LED was not stable
⇒ Junk (HV cables swapped by mistake between P18 ↔ P24)

22:00 #9957 pedestal @ 5×10^5 gain
#9958 LED @ 5×10^5
LED (2.6) Driver (0.5)
PH (122–142, 91–96)
#9959 LED same as #9958

#9960 LED @ 5×10^5 try to equalize the intensities
LED (2.6) Driver (0.5) of LED 2 & 6
PH (127-147, ~~88~~-93)

▷ HV scan
- −50V with respect to 5×10^5 setting
- saved as 051025_5.hV

23:20 #9961 pedestal @ −50V
#9962 LED @ −50V
LED (2.6) Driver (0,5)
PH (137-157, 92-97)

23:35 Circulation stop (stable operation)

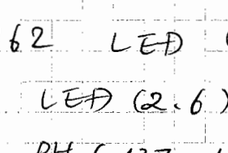
▷ To Do
- CR counter setup
- HV scan −100V ±50V ±100V
- Rate dependence
- Strang α-ring problem

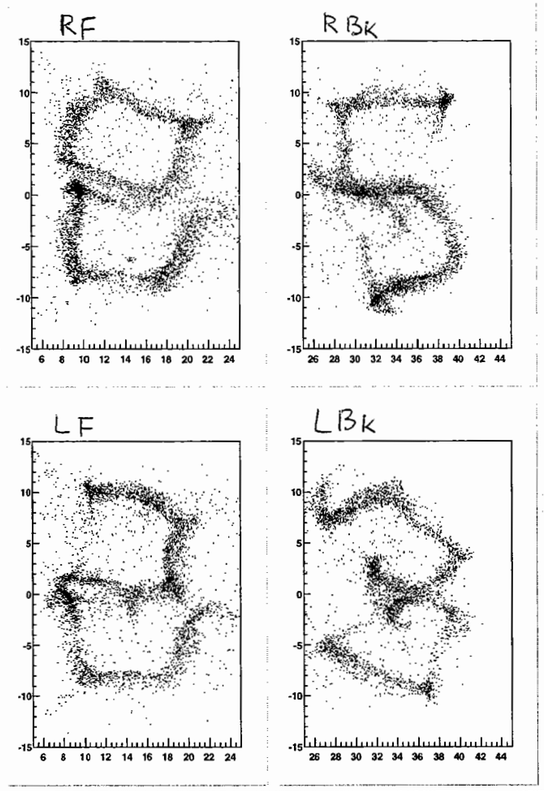
26/Oct/2005

7:05 Circulation start

CR trigger timing check

gate ←80nsec ADC O.K.

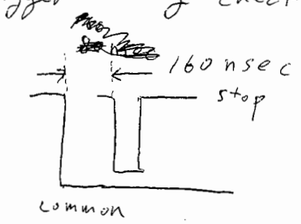




7:30 #9963 CR test
8.07 #9964 〃

CR thigger timing check

TDC



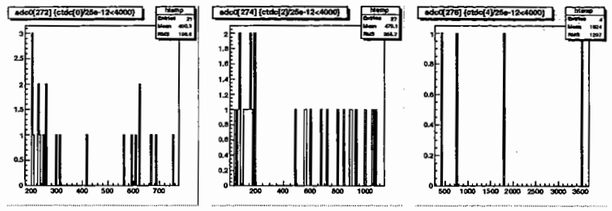
⇓

subtracted delay by 100 nsec

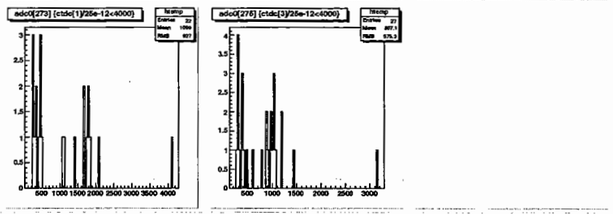
8.32 #9965 CR test
8:41 #9966 〃

front middle back

up

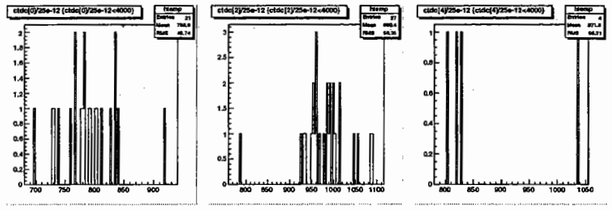


down

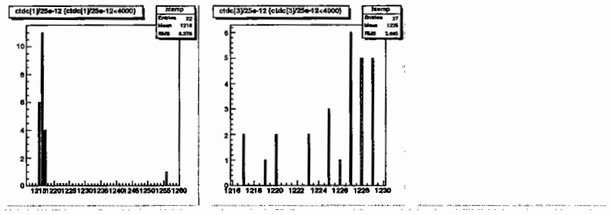


CR counters ADC

up



low



CR counters TDC

CR mode is o.k. except for back counters.

HV scan start

−100 V

load ~~0525~~ 051025_5.hv
decrease −50 V for each
9:42 saved as "051026_1.hv"

10:15 #9968 pedestal

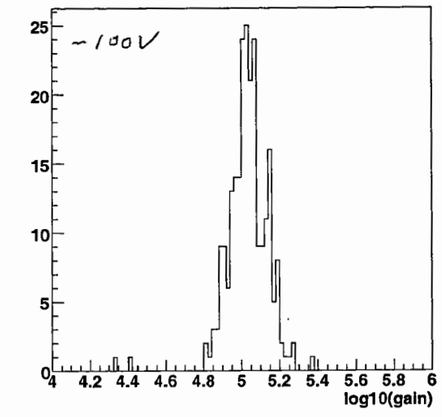
10:18 #9969 LED (2.6) Driver (0.5)
PH (137-157, 92-97)

10:42 #9971 LED (2.6) Driver (0.5)
PH (157-177, 97-107)

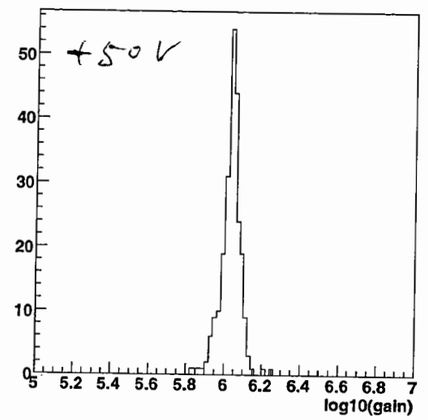
+50 V

11:08 set HV +50V from 5e5.
⇒ saved as "051026_2.hv"

gain distribution



gain distribution



11:56 #9974 LED (2.6) Driver (0.5)
PH (112-125, 87-92) ← LED was unstable during this run

12:00 #9975 pedestal

12:02 #9976 α

12:12 #9977 LED same as 9974

12:20 #9978 α

+100 V

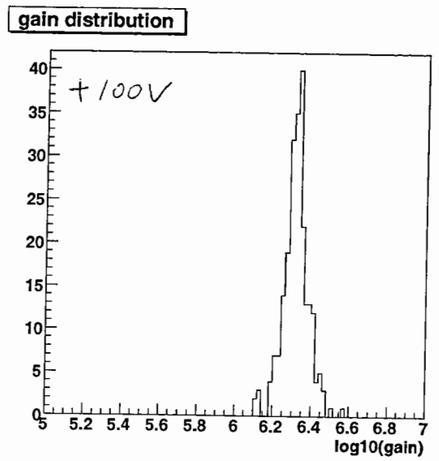
12:29 set HV +100 from 5e5
⇒ saved "051026_3.hv"

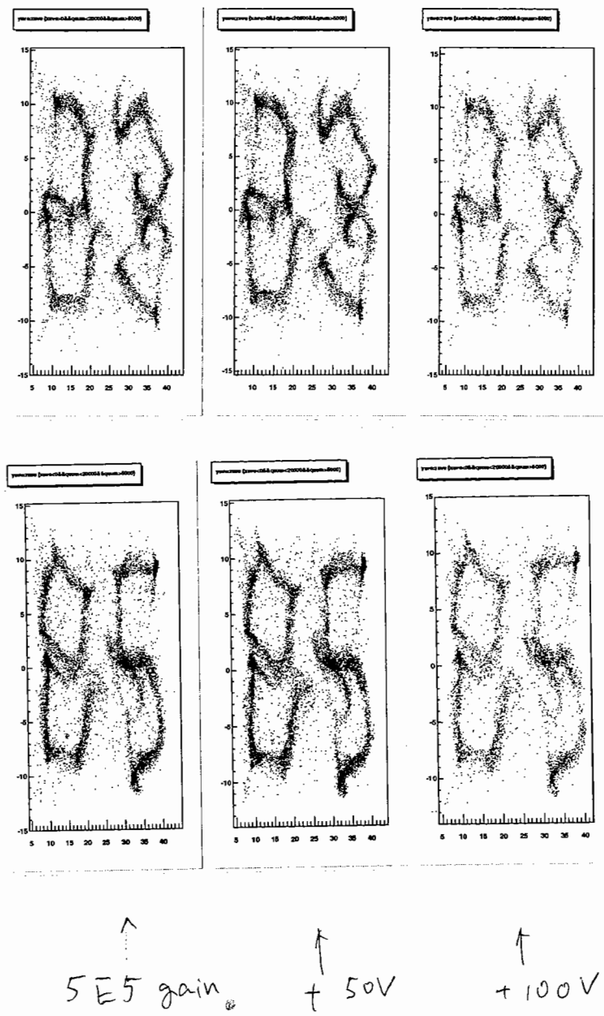
12:49 #9979 LED (2.6) Driver (0.5)
PH (104-116, 84-89)

12:56 #9980 pedestal

12:57 #9981 α

14:45 load "051025_4.hv" (5e5 gain)





shape ~~is~~ not changed by gain.

← left

Y
↑
└→ Z

← high

5E5 gain ↑ +50V ↑ +100V

Summay of Shift

✓ CR counter set up (except for back counters pair)
✓ HV scan −100, +50, +100 V
· strange α-ring problem
It seems that source is not circle.
· To be checked with MC if it can happen.
· Possibility of Q.E. estimation has to be checked.

To do
· Rate dependence.
· strange α-ring problem
· fix back CR counter problem

16:00 Preparation for the rate dependence test

▷ We found that if there is a signal to the individual channel in LED driver, the output signal has the pulse width equal to the input one (input) instead of the value in "led.dat".

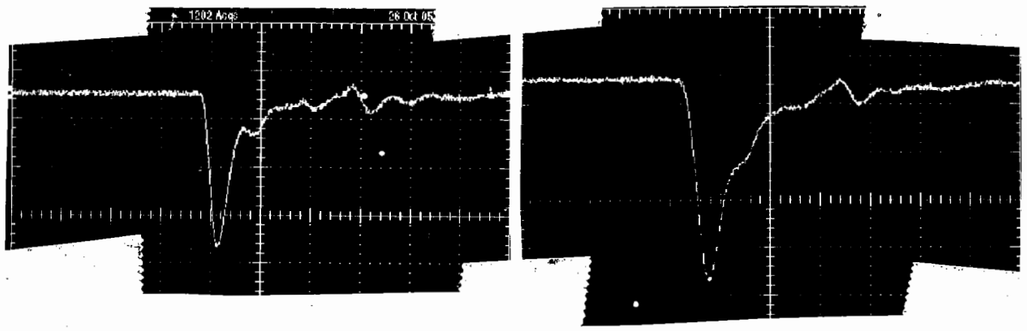
▷ At this second PMT test, we have been using the common input. In this case the output width is equal to the value in "led.dat", which is ~ 9nsec

▷ 50nsec ~~input~~ gate signal was used for the driver input (the individual channel). in the last PMT test. This means ~~the~~ width was 50nsec. ~~for~~ (of the input signal to the LED)

▷ We need to use the individual input in the LED driver for the rate dependence test. to flash the BG LED independtly.

▷ we compared the shape of the PMT signal varying the width of the input signal to the LED

9nsec 50nsec (same scale)



width	9nsec	30nsec	50nsec
Rise time	14nsec	20	24
Fall time	53	~~80~~	96

⇓

closer to the shape of the CR signal

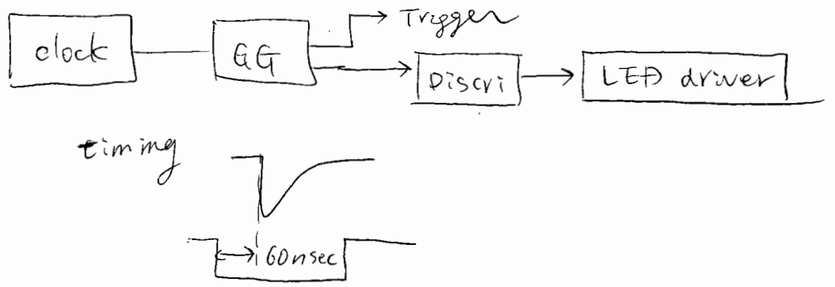
19:20 #9982 pedestal @ 5×10^5 gain (051025_4.hv)

19:25 #9983 LED @ 5×10^5 gain
- LED #2 & #6
- LED driver input @ each channel (CH0, CH5)
- Input width 9nsec
- Pulse height (127-47, 88-93)

19:50 #9984 LED @ 5×10^5 gain
- LED #2 & #6
- LED driver input @ each channel
- Input width 50nsec
- Pulse height (~~70~~-75, 66-71)

~~19:20 #9982~~

▷ We changed the logic to generate narrow input signal (~10ns)



▷ Effect of the width of the LED input pulse.

21:02 #9985 pedestal @ 5×10^5 gain

#9986 Junk

#9987 LED @ 5×10^5 gain
- LED #2 & #6
- LED driver input 8nsec width @ CH0 & CH5
- pulse height (127-47, 88-93)

#9988 LED @ 5×10^5 gain
- LED #2 & #6
- LED driver input 30nsec width @ CH0 & 5
- pulse height (79-84, 73-78)

#9989 LED @ 5×10^5 gain
- LED #3 & #7
- Driver input 30nsec width @ CH0 & 5
- Pulse height (70-75, 69-74)

#9990, 9991 → Junk.

#99902 LED @ 5×10^5 gain
- LED #1 & #5
- Driver input 30nsec width @ CH0 & 5
- Pulse height (~~89~~-94, 73-78)

22:36

#9993 LED @ 5×10^5 gain

- LED #4 & #8
- Driver input 30nsec @ CH0 & 5
- Pulse height (70-75, 71-76)

22:55 #9994 pedestal @ 5×10^5 gain

#9995 alpha @ 5×10^5 gain 50k evts

23:32 #9996 CR run

23:33 switch to the stabe operation mode

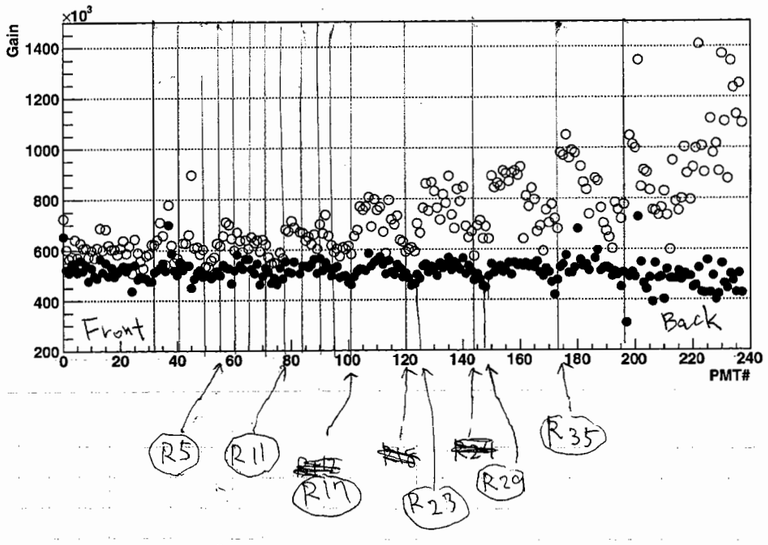
Plan for tomorrow

- Rate dependence test
  → ~~We need much higher rate of the BG LED~~ ~~because~~
- CR counter at the back side is not working yet.

27 / Oct / 2005

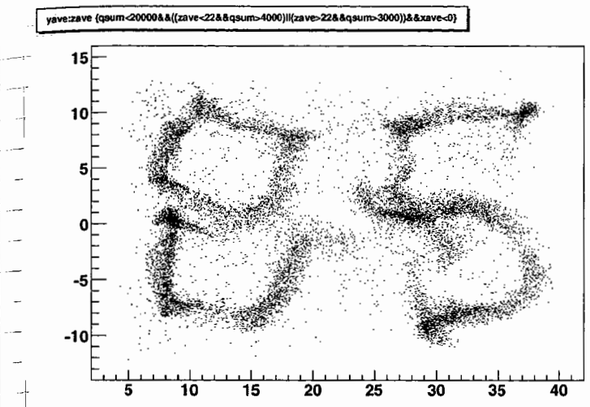
7:10 Circulation start

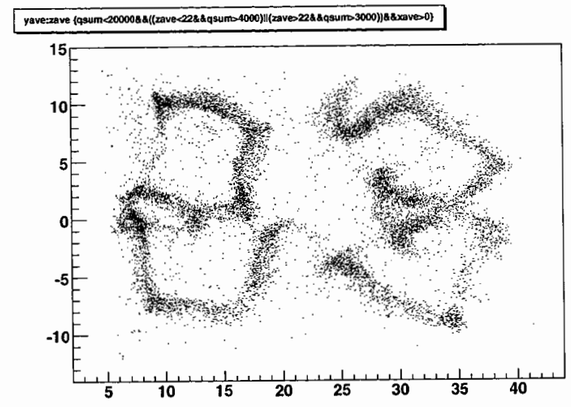
stop #9991~~9~~6



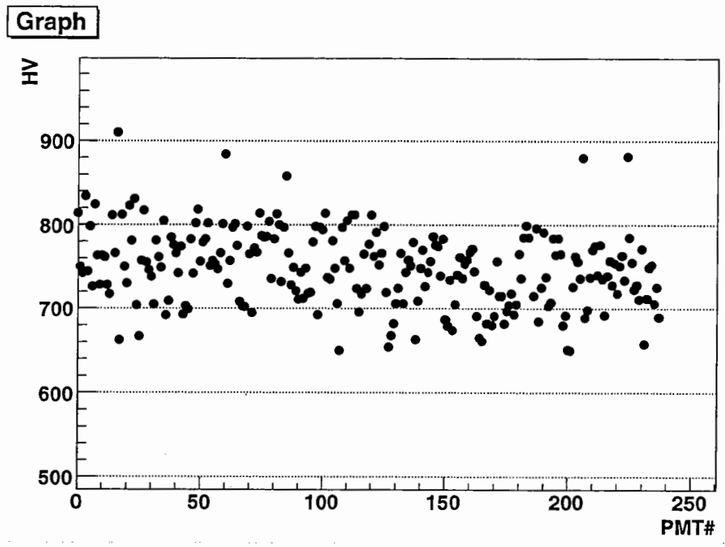
- width 9nsec (#9987) (2.6)
- width 30nsec (#9993) (4.8)

(There is a plot of more run2 on 2 Pages after)

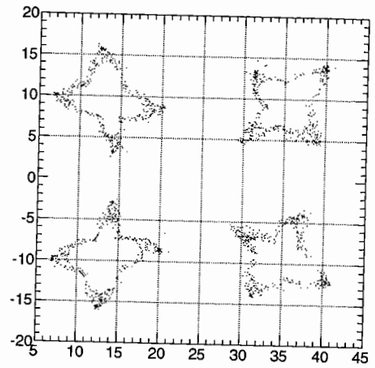




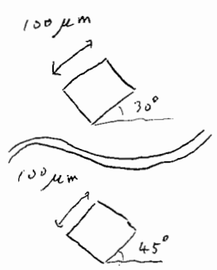
↑ #9995 with 30 nsec LED gain calibration
Shape is not changed.

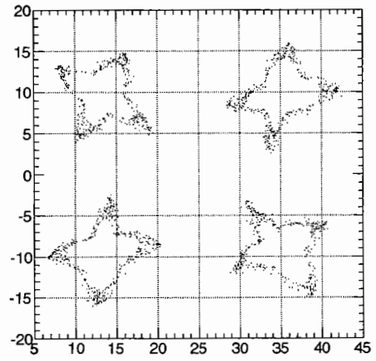


It seems 30 nsec calibration is rather reasonable

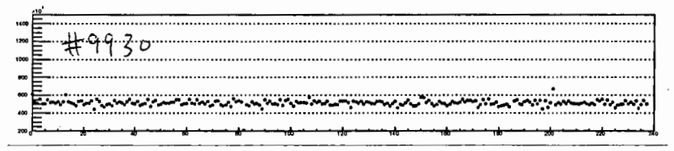


geant 3 simulation



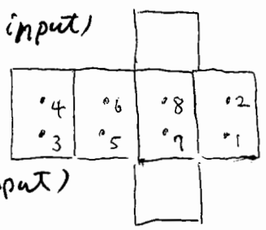


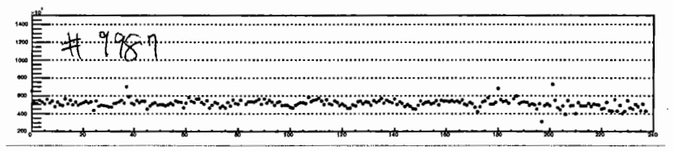
Gain estimation

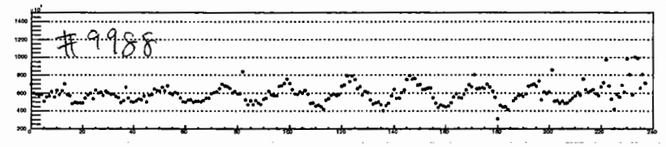


(2.6) Just after HV adjust

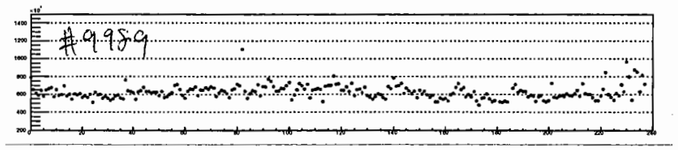
9 nsec
common input)



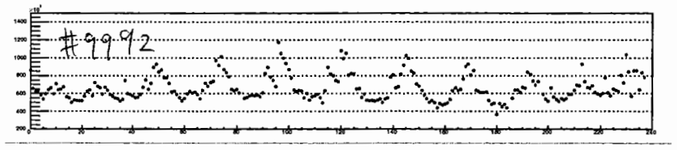




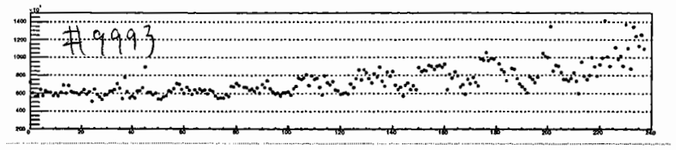
~~(7.9)~~
(2.6)
30 nsec



~~(11.5)~~
(3.7)
30 nsec



(1.5)
30 nsec



(4.8)
30 nsec

12:30 #9997 pedestal
#9998 Junk

17:00. RUN # 10000. LED Calibration

- LED #2 & #6
- LED Driver Input. 9nsec width @ CH. 4 & 5
- pulse height (127–147, 88–93).

5×10^5 Gain

17:30 all HV adjust to 800 V. using

17:35 LED Calibration RUN # 10001.

- LED #2 & #6
- LED Driver Input 9nsec width @ CH 4 5
- pulse height (104–124, 82–87)

→ ~~little~~ # of photoelectron observed. → increased ← light intensity

17:42 RUN # 10002. LED Calibration

- pulse height (112–132, 86–91)

Rate Dependece Test.

- Logic. Back Ground LED intensity (i.e. pulse height) scan.

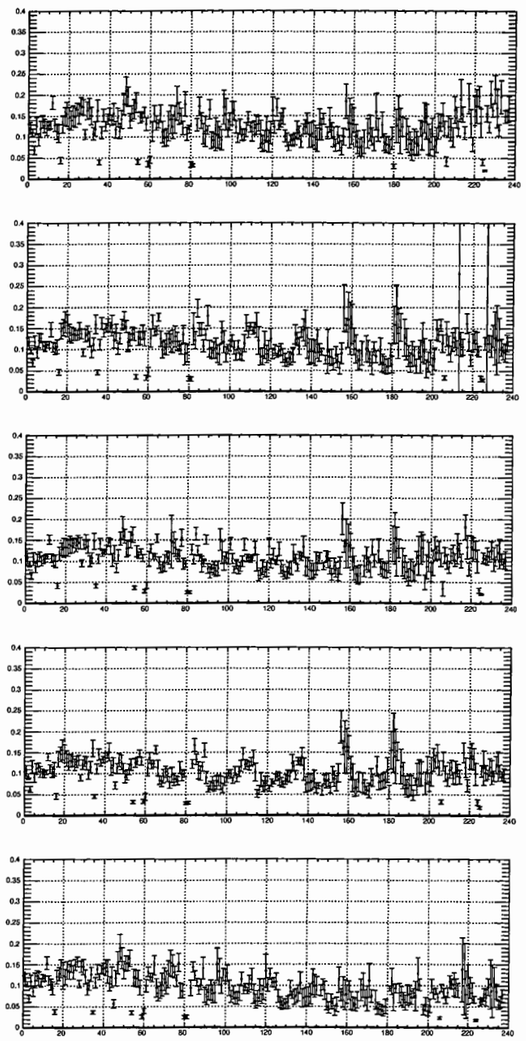
CAEN LED Ch	LED ID
#1	#3
#2	#4
#3	#7
#4	#8

21:00 Change LED setting

CAEN	ID
#1	#5
#2	#4
#3	#1
#4	#8

→ LED setting
CAEN #1, #2, #3, #4
(85, 72, 84, 67)

HV Tripped.



Q.E.
estimated from #9995

with LED
#9987 (2.6) 9μsec

#9988 (2.6) 30μsec

#9989 (3.7) 30μsec

#9992 (1.5) 30μsec

#9993 (4.8) 30μsec

RUN# 10003. LED. B.G. monitor @ RUN.
→ Suddenly the intensity of LED gets high during this run.
8HVs Tripped. C31, F26, F27 BK25
→ RUN STOPPED. BK8 BK14 BK15
BT10,

23:00 Stable operation. Circulator Restart

@
28/Oct/2005

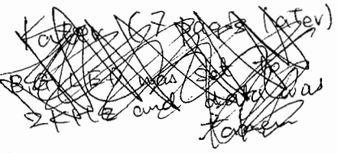
7:05 HV trip (BT16, T21, BK12, F27, BK14, BK8, BK25)
→ Recovered
7:15 Circulation started
8:19 HV trip (BK26) → Recovered
BK8
8:38

#10004 junk
#10005 pedestal w/o LED BG
#10006 BG. monitor
8:49 #10007 LED calib w/o LED BG.
BG. 1kHz LED
8:56 #10008 LED calib with LED BG.
└ F27 HV trip → Recovered
BK8 HV trip → Recovered
9:04 #10009 pedestal w/ LED B.G.
F26 HV trip → Recovered
~~B.G. 2kLED 2kHz~~
9:10 #10010 ~~pedestal w/o B.G.~~
LED B.G. monitor

BG LED 2kHz

9:16 # 10011 pedestal w/o B.G.

10012 LED calib w/o B.G.
BK14 HV trip



10013 LED calib with B.G. 2kHz.

10014 pedestal with B.G. 2kHz.

10015 B.G. LED monitor
- 200 Hz.
- Qsum ~ 3 x10^5

BG LED 4kHz

10:00 # 10016 pedestal w/o B.G.
BT 16 HV trip

10017 ~ # 10020 Junk
midas error
rebooted megontrol → O.K.

10:45 # 10021 LED calib w/o B.G.
- BK15 HV trip

BT16 HV trip

10022 pedestal w/o B.G.

10023 LED calib w/ B.G 4kHz
- BK 8 HV trip
- F 27 HV trip
  F 26 BK25 HV trip

10024 same as # 10023
- BK8 HV trip
  BK14 HV trip F27. BT16 HV trip

10025 same as # 10023
- BK8 BT16 F27 BK25 HV trip

10026 same as # 10023
BK12 BK8 BK3 HV trip

10027 same as # 10023
F26 F27 BK8 F7 HV trip

11:33 # 10028 same as # 10023
F27 BK25 BK8 HV trip

10029 same as ~~# 10023~~ # 10023
- BK14 F27 BK8 HV trip
- F29 BK26 F24

10030 same as # 10023
F27 HV trip

10031 pedestal with B.G. 4kHz

10032 B.G. LED monitor 200Hz. Qsum 2.8×10^5

10033 same as # 10023 BG 4kHz
F27 HV trip (~~may be~~ ~ ~~event~~ event # ~ 29000)

BK8 HV trip

10034 pedestal with BG. 4kHz

10035 B.G. monitor 200Hz Qsum ~ 2.6×10^5

B.G 6kHz

12:37 # 10036 pedestal w/o B.G.

10037 LED calib w/o B.G.
- BK12 HV Error

10038 same as # 10037.
- BK25 HV error

L15 HV error (after run 10038)

10039 LED calib with B.G. 6kHz
- F26, BK8, F27 HV trip

10040 same as # 10039
BK14. BK8

14:10 # 10041 same as # 10039
~~BK~~ F27 (in the run) HV trip
BK8 (while pause) → ok.

10042 pedestal with B.G. 6kHz

10043 B.G. LED monitor 200Hz Qsum ~ 2.5×10^5
BK8 HV error (0 ~ 400 event)
event 400 ~ 10000 Ok.

28/Oct/2005

8kHz B.G

14:23 # 10044 pedestal without B.G.

10045 LED calib without B.G.

10046 LED calib with B.G 8kHz

·F27 BK8 F26 BK25 BK14 BK26 L19 HV-trip

(after run) BK8 F29 Hv-trip

10047 same as # 10046.

→ { F27 BK25 F7 BK8 BK15 F26
F16 BK26 BK3

During fixing HV error, we stopped B.G. LED

HV recovered → Restart LED Calibration with B.G.

HV Tripped AGAIN BT16, F27, BK25, F26.

15:12 # 10048 same as # 10046.

HV Tripped. F26., F27. at the end of RUN # 10046.

10049 Pedestal # 10049 with B.G.

HV Tripped. BK14.

BK8 T41 BK15 BK25

16:04 # 10050 LED B.G. light intensity monitor RUN,

HV Tripped F26. B.G. LED 6.8KHz

F27, BK8

10051 B.G. LED monitor RUN. @ 300Hz

12kHz B.G.

10052 Pedestal w/o LED B.G.

10053 LED Calib w/o LED B.G.

LED light intensity (not B.G. LED, "measuring" LED)

is set to (#0, #5) = (124, 89).

10000 events were taken and RUN was stopped

10054. LED Calib. RUN with LED B.G.

10055 Pedestal with LED B.G.

@ ~1900 events HV Tripped F27. → RUN Pause.

F30.

HV Recovered → RUN resumed.

10056. LED. B.G. light intensity monitor RUN @ 120HZ.

@ ~7500 events HV Tripped. BK8. → RUN Pause.

HV recovered → RUN resumed. F24., BK14.

B.G. 16KHz.

10057. Pedestal w/o B.G. LED

~~@ ~9000 events~~

10058. LED Calib @ w/o B.G. LED

@ ~9000 events HV error F26. → RUN Pause.

HV recovered → RUN restarted.

X 10059. LED Calib with B.G. LED

↓

Junk.

MSCB Error. Scfe. error.

LeCroy HV Module Switched off.

Scfe Restart → Error. "Cannot connect to mscb005"

SCFE error. ODB setting error ...

⇒ Restart

10060 JUNK. Logger Failed. → manually kill mlogger.

Restart Logger.

10061. LED Calib with B.G. LED.

10062 Pedestal with B.G. LED

X # 10063 B.G. LED monitor RUN. @ 164Hz

↑ Junk. HV Error During RUN.

BK14, F27.

10064 Same as # 10063.

↓

~~Some ADC channels are "overflow"~~ Ob

HV Trip BK8.

B.G. 24KHz

#10065 Pedestal w/o LED B.G.

#10066 LED Calib w/o LED B.G.

X #10067 JUNK LED calib with LED B.G. 24KHz
BT16, F27 HV Tripped → RUN STOPPED

#10068 same as #10067
@ ~6000 event HV Tripped → RUN Pause
BK25
HV Recovered → RUN resume
@ ~11200 event HV Tripped.
BK8, F27, F29, F7
BK15.
RUN resumed.

#10069. Pedestal ~~w/~~th B.G. LED

#10070. B.G. LED intensity monitor RUN @ 240Hz
@ ~8500 events HV error BK14.
RUN Paused and resumed

B.G. 32KHz

#10071 Pedestal w/o. B.G. LED.

#10072. LED Calib w/o B.G. LED

#10073 LED Calib with B.G. LED
@ ~3000 events HV Tripped.
BK8 F27 F16, F26
RUN resumed after HV is recovered
@ ~8000 events HV Tripped
F31, BT16., BK3, BK8, BK25
BK14, F7. F27.

21:22. #10074 Same as #10073.
LED Calib with B.G. LED
@ ~5500 events. HV Tripped. RUN Paused.
F29.
HV Recoverd. @ ~8000 events HV Trip Again
F27.

#10075 same as #10073
↳ at the very end of this RUN. (~9800 events)
HV Tripped.

#10076 Pedestal with B.G. LED ~~32KHz~~

#10077 LED Monitor RUN @ 250Hz → HV Trip BK15. @ ~7000 event.
didn't check the Rate of LED. DO NOT USE!
Re-run the LED RUN.

#10078 LED Calib @ B.G. LED 32KHz
@ ~9900 events. BK8, BK25, F27.
HV Tripped.
F30, BK26, BK14, F16., BK25 F29
RUN Paused and recover HV:, RUN resumed.

X #~~10079~~ JUNK Pedestal @ B.G. LED 32KHz
@ ~3000 events HV Tripped F7, F27.
RUN Paused.

#10080 same as #10079

B.G. 48KHz

#10081 Pedestal @ w/o B.G. LED

#10082 LED Calib w/o B.G. LED
↑
at the very end of this RUN (~10000 events)
BK8 HV Tripped.

JUNK
#~~10083~~. LED Calib with B.G. LED @ 48KHz
@ ~3000 events BK3, BT16. BK8, BK14.
~~RUN Paused and~~ resumed.

10084 same as # 10083

@ ~7000 events, BK14, F27 HV Tripped.

RUN Paused and resumed after HV is recovered

as the very end of this RUN (~10000 events) BF25 HV Tripped.

10085 Pedestal with B.G. LED 48KHz

@ ~4500 events. F27 HV Tripped.

RUN Paused and after HV is recoverd resumed.

F26. HV Tripped. → Before this RUN.

~~# 10086~~ B.G. LED Monitor RUN @ 480Hz,

JUNK.

@ ~3000 events BK14. HV Tripped.

RUN paused and after HV is recovered, RUN ~~was~~ resumed.

#. 10087 same as # 10086

@ ~1000 events BK8 HV Tripped.

B.G. 64KHz

10088 Pedestal w/o B.G. LED.

10089 LED Calib w/o B.G. LED

10090 LED Calib with 64 KHz B.G. LED

@ ~3500 events, BT16, BK8, F27 HV Tripped. → Pause RUN

HV error fixed. → RUN resumed.

@ ~8500 events F30, BK8, F27, BK25 HV Tripped → Pause RUN

HV error fixed → RUN resumed,

at the very end of this RUN (@~12000 events).

BT16, BK8, BK26, BK14, F27, F16 HV Tripped.

10091. ~~00~~ Pedestal with B.G. LED 64KHz

~~# 10092~~ B.G. LED monitor RUN @ 640Hz

JUNK

↳ at the very end of this RUN (@~9800 events)

F29 HV Tripped.

~~B.G. 640Hz~~

23:01 Circulation STOPPED, Switched to Stable Operation.

10093 B.G. LED Monitor RUN @ 640Hz.

@~7300 events BK3. HV Tripped → RUN Paused.

HV Error Fixed. → RUN resumed.

10094 Cosmic Ray RUN.

@ 8 events BK8 HV error → fixed.

29/Oct/2005

7:05 During rate dependence test, there are PMT's whose maximum current is less than we wanted to test.

So. HV of those PMTs are set to 800V, and others 0V.

With more intense LED. we tested rate dependence again.

29/Oct/2005

8:03 Gas circulation

error message "rpc time out, routine="rpc_transition", host="megon1n01"

Restarted SCFe. Logger. Lpframework.

But cannot start run

reboot megon1n01 ⇒ O.K.

Changed LED intensity

BG 1kHz

12:50 # 10095 pedestal w/o B.G LED

~~10096~~ LED calib w/o B.G. LED.

↑ Junk

13:30 megon1n01 ~~file~~ freezed, reboot manually

HV couldn't be controlled.

(Lecroy HV rebooted.

ODB Cleaned. ⇒ HV OK.

SCFe Restart

15:00 megon1n01 freezed. reboot

15:20 # 10099 Pedestal w/o B.G.

10100 Gain Calibration w/o B.G.

LED CAEN ch 0, 5 = #0 (124, 126, 128, 130, 132, 134)

#5 (89, 90, 91, 92, 93, 94)

10101. Rate dependence LED RUN w/o B.G.

▶ "measuring" LED intensity is set to #0 = 124, 124, 124, ...

#5 = 89, 89, 89, ...

HV Trip F16. → fixed.

10102. Rate Dependence. LED RUN with B.G. 1KHz

10103 " Pedestal RUN with B.G. 1KHz.

HV Trip BK14 → fixed.

10104. B.G. LED intensity monitor RUN. @ 200Hz

2KHz # 10105 Pedestal w/o B.G.

10106. LED Run w/o B.G.

10107 LED Run. with. B.G. 2KHz.

10108 Pedestal with B.G. 2KHz.

10109. LED ~~RUN~~ B.G. intensity monitor RUN @ 200Hz.

4KHz

10110. Pedestal w/o. B.G.

10111. LED RUN w/o. B.G.

10112. LED RUN with B.G. 4KHz

↑ at the very end of this RUN (@ ~9000 events)

BK26 HV Tripped.

BK14

10113. Pedestal with B.G. 4KHz

10114 B.G. LED intensity monitor @ 550Hz

6KHz # 10115 Pedestal w/o. B.G. LED

10116 Rate Dependence LED Run w/o B.G.

10117. " LED Run with B.G. 6KHz

↳ @ ~8000 events F16 HV Tripped → RUN Pause

resume RUN after HV error fixed.

at the very end of this RUN. (~@1100 events)

BK15 HV Tripped → fixed.

~~10118~~ JUNK Pedestal with B.G. 8KHz

↳ @ ~5000 events BK14 HV Tripped. → RUN Pause

RUN resumed after HV is fixed.

10119 Same as #10118

10120 B.G. LED intensity monitor RUN @ 600Hz

8KHz

10121 Pedestal w/o B.G.

10122 LED Run w/o B.G.

10123 LED Run with B.G. 8KHz

↳ BK26, F16 HV Tripped at the very end of this RUN

10124 Pedestal Run with B.G. 8KHz

~~10125~~ JUNK ~~B.G. L~~

10126 B.G. LED intensity monitor @ 800Hz

12KHz 18:05

10127 rate dependence Pedestal w/o B.G.

10128 LED Run w/o B.G.

10129 LED Run with B.G. 12KHz

BK14, B26, BK15, F16. HV Tripped. → ~~fixed~~.

10130 LED RUN same as #10129

at the very end of this RUN, BK14, F23

HV Tripped.

10131 Pedestal with B.G.

10132 B.G. LED intensity monitor @ 160Hz

16KHz

10133 Pedestal w/o B.G.

10134 JUNK.

10135 LED RUN w/o B.G.

10136 LED Run with B.G. 16KHz.

BK3, BK14, BK15, BK26, F16. HV Tripped.

at the end of RUN (@ ~10000 events)

10137 Pedestal with B.G. 16KHz.

10138 B.G. LED intensity monitor @240Hz

24KHz

10139 Pedestal w/o B.G.

10140 LED RUN w/o B.G.

10141 LED RUN with B.G. @24KHz.

BK14, BK26, F16 HV Tripped @ ~5000 events

→ RUN Paused., HV error is fixed., RUN resumed.

BK14, BK26, HV Tripped again → fixed.

RUN resumed.

BK14, F16. HV Tripped → fixed.

10142 Pedestal with B.G. 24KHz.

@ ~1600 events BK15 HV Tripped → RUN Pause.

HV error is fixed, RUN resumed.

10143 B.G. LED intensity monitor RUN @ 680Hz.

32KHz

10144 Pedestal w/o B.G.

10145 LED Run w/o B.G.

↳ at the end of this run. BK26 HV Tripped. → fixed.

10146 LED Run with B.G. 32KHz

F16, BK3, BK14, BK26. HV Tripped @ ~3000 events

→ run paused. fixed HV error, run resumed.

BK14 HV Tripped again → fixed. run resumed.

@ ~7000 events

BK14, BK26. HV Tripped again → fixed, run resumed

@ ~8600 events

BK14, BK26, F16 BK15 HV Tripped.

#10147 Pedestal with B.G. 32KHz

#10148 B.G. LED intensity monitor @480Hz

48KHz

#10149 Pedestal w/o B.G.

#10150 LED Run w/o B.G.

#10151 LED Run with B.G. 48KHz

- BK14 HV Tripped soon after run started.
- BK3, 14, 26, 15 Tripped.
- F16, BK15 BK33

Tripped → RUN Pause → HV Fix. → RUN Resume

#10152 Pedestal with B.G. 48KHz

~~#10153 B.G. JUNK~~

#10154 B.G. LED intensity monitor @650Hz

64KHz

#10155. Pedestal w/o B.G.

#10156 LED RUN w/o B.G.

#10157 LED RUN with BG 64KHz

BK14, BK15. T41. F16. BK26, BK3
BK29

@3700 events, @5364 events → LeCroy HV module Error → restart

RUN Pause
HV Tripped → HV Error fixed → RUN resume

LeCroy HV module Error.

Scfrontend. Failed → Restart Scfrontend.

#10158. Pedestal with B.G. 64KHz

#10159. B.G. LED intensity monitor @640Hz

↳ BK14 HV Tripped at the end of this run.
→ fixed.

#10160 Cosmic Ray RUN

20:00 Start Circulation. Stable Operation mode

~~Nov~~
30/Oct/2005

9:06 Circulation start, set all HV 800V

9:16 stop #10160

DRS Test

- DRS test directory ~/online/src/frontend/test/lpdrstest
- Two DRS Boards, each has two Chips.
- This time, boards are connected through USB.
- To use USB on Linux.

  We need usb.h libusb.so /usr/include/ /uss/lib/
  DRS.cpp, DRS.h $MEGSYS/online/drivers/drs/
  DRS_CWrapper.cpp, .h
  → this time ~/online/src/frontend/drs/

  msch.c
  usb.h → $MIDASSYS/msch/

  Stefan now writing new usb driver codes, so these will not be used soon.
  ⇒ musbstd.c .h

- "Ctt" Class "DRS" is defined in DRS.cpp, .h
  we can access to DRS through USB, using 'Member function' of that class, like,
  fDRS -> GetBoard(0) -> StartDomino();
- In "C", we can use functions like 'drs_start_domino()' which are defined in DRS_CWrapper..

30/October/2005.

- It seems that we cannot use two chips on a boards.
  Use 10 channels on the first chip.

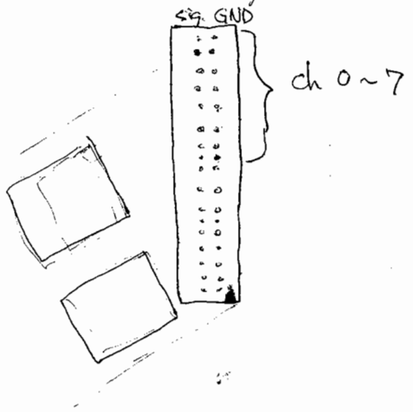
- At this moment, I ~~cannot~~ don't know how to trigger on the board, use soft_trigger for a moment,

- We can switch clock for time calibration by

  drs_enable_tcal( ):

  If it is set "1", channel 10 clock signal is "input".

- Channel assignment on the Board



- Read Waveform (Int chip, channel, double * waveform,
  bool resCalib, bool tempCalib, double * time, bool timeCalib)

  - We can get waveform with this function
  - we get waveform as array of "double"
  - I tried calibration switch ON/OFF, but
    At this moment it seems that these switches make no sense.
    Waveform is returned as integer like '3703' correspond to ADC channel (0~4095, 12bits) but already inverted.
    Offset (or pedestal) seem to be set around 3500
  - "time"

30/Oct/2005

- Domino speed is set with function drs_set_freq(f):
  frequency (f) is specified with GHz unit

frontend

- Implement for DRS through USB
- define macro "DRS" in frontend.h
- compile with "-DHAVE_USB", "-DHAVE_LIBUSB", "-lusb", "-DHAVE_DRS"
- In odb /Equipment/Trigger/settings
  added "DRS in Cosmic run"
  "DRS in Pedestal run"
  as well as "DRS in PiO run"
  "DRS in Alpha run".

  When taking DRS data, these keys have to be 1

- In LPframework, I edited romeConfig to analyze DRS0.
  and, edited LPTDRSCalib.cpp to not to calibrate but only fill drs0 to histogram.
- In LPmonitor, we can see DRS raw data (drs0) in DRS tab.

These setups seem to work.
But, trigger doesn't work well (Soft-trigger() works well but timing may be bad)

When write data 'y', run doesn't start. Maybe logger has bug.

When calibration is done? Online? offline? In reading wavefor?

Writing and Reading speed is very slow due to USB, ~0.1 Hz

* If you restart frontend, you have to reconnect usb cables, because it fails to initialize DRS Board
  and start frontend as "root".

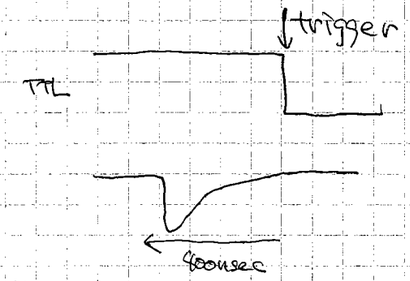
23:55 Circulation stopped

31 / October / 2005 (Monday)

Answer to yesterday questions.

① Trigger

Input TTL signal into the LEMO connector at the tail of the board.



② Calibration

We need xML file to calibrate in drs_read_wave( ):

These files suppose to be in ~/online/bin/calibrations

Calibration flags in ~~the~~ arguments ~~are~~ set to 'true'.

Then returned 'waveform' has been already calibrated, with the unit ~~of~~ [mV].

We need to write these value with as high precision as possible.

"DRS0" WORD (unsigned short)

"(waveform[5000])/0.152587891

-5V ~ 5V : 16 bits.

so when reading, we have to

multiply 0.000152587891 and add 5.

Time calibration is also done.

But now the xml file for Board 2 isn't exist.

Returned values are like

0.000
1.012
2.004
3.102
3.895

to save 10 psec resolution

We record WORD value multiplied 40.

1022.8900
1023.0000

"DRSTIME" WORD (unsigned short)

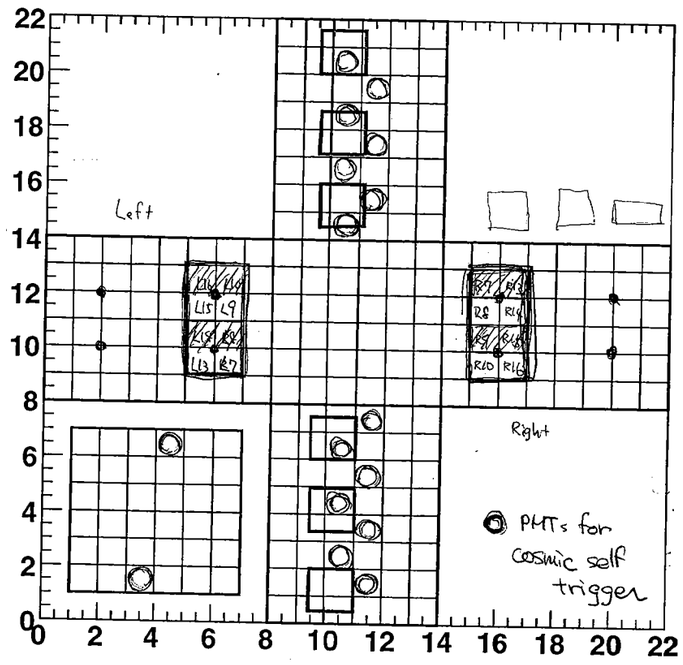
31 / Oct (2005

19:30 HV set to gain = 5e5 (load '051025_4.hv')

20:40	# 10178	pedestal
20:54	# 10179	pedestal
20:56	# 10180	LED Gain calib. (#2 127, 131, 135, 139, 143, 147 CH 0; #6 88 89 90 91 92 93 CH 5)
21:06	# 10181	same as previous run

Use these

16 channel



		ADC #	ADC ch	Hitch	HV #	Hcable	Splitter	Bundy	Discri.
L7	61	56	13-56	0-1-10	22	23	1-1-1	1-9	0-4-6
L8	62	8	13-8	0-0-6	6	7	0-1-1	0-9	0-4-7
L9	63	1	13-1	0-1-2	14	15	0-0-2	0-2	0-1-4
L10	64	49	13-49	0-2-6	30	31	1-0-2	1-2	0-1-5
R7	73	58	13-58	0-1-8	20	21	1-1-3	1-11	0-2-6
R8	74	10	13-10	0-0-4	4	5	0-1-3	0-11	0-2-7
R9	75	3	13-3	0-1-0	12	13	0-0-4	0-4	0-3-4
R10	76	130	11-34	0-2-4	28	29	1-0-4	2-35	0-3-5
L13	85	76	13-76	0-5-6	66	67	1-3-5	1-29	0-4-10
L14	86	129	11-33	0-5-2	62	63	1-4-1	2-34	0-4-11
L15	87	93	13-93	0-4-2	50	51	1-5-6	1-46	0-1-8
L16	88	89	13-89	0-4-6	54	55	1-5-2	1-42	0-1-9
R13	97	78	13-78	0-5-4	64	65	1-3-7	1-31	0-2-10
R14	98	82	13-82	0-5-0	60	61	1-4-3	1-35	0-2-11
R15	99	95	13-95	0-4-0	48	49	1-5-8	1-48	0-3-8
R16	100	91	13-91	0-4-4	52	53	1-5-4	1-44	0-3-9

1st / November / 2005 (Tue.)

Trigger —— NIM to TTL

PMT output —— Fan out —— DRS
(OUT)

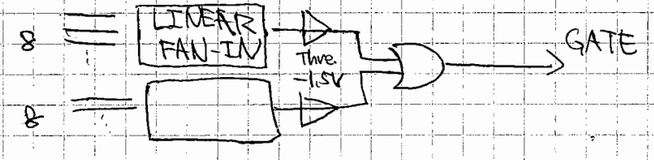
Fan-out : Phillips 740 — No delay cable
LeCroy 428F

			Board 1				Board 2
Phillips	0-0	L7	0	LeCroy	0-0	L8	0
	0-1	L13	1		1	L14	1
	2	R10	2		2	R9	2
	3	R16	3		3	R15	3
	1-0	L9	4		1-0	L10	4
	1	L15	5		1	L16	5
	2	R8	6		2	R7	6
	3	R14	7		3	R13	7

FAN-OUT offsets are set 0 (~~0~~ a few mV)

Cosmic Ray self trigger

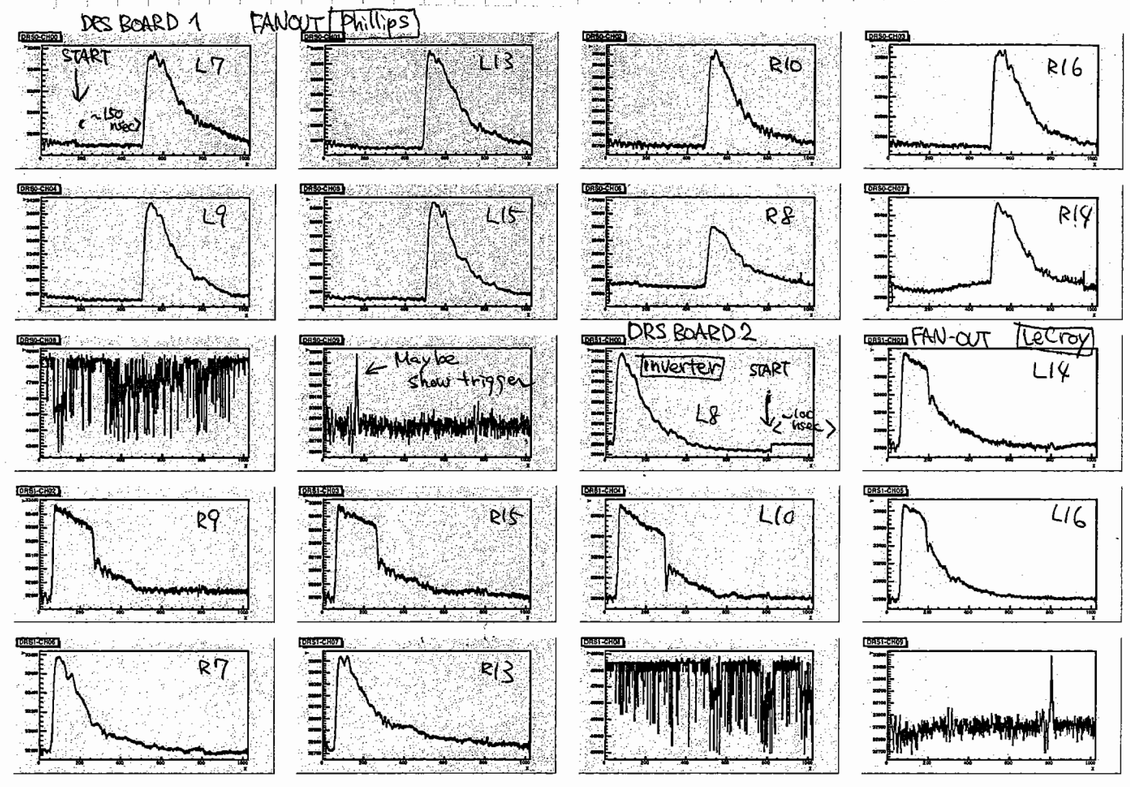
- I made a trigger for cosmic-ray ~~by self~~ which doesn't use counters, because ~~by~~ trigger rate by counters were very low.
- Setting is almost the same as February 05. but this time take 'AND' of top and bottom.
  Threshold are -1.5 V each.



- Use discrimination for α-trigger
  Threshold have been set ~ -750

1 / Nov / 2005

Online monitor

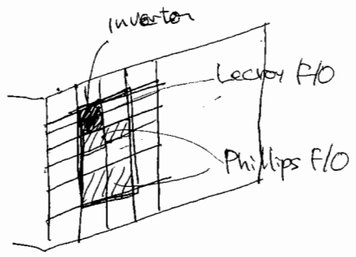


- Succeed in taking waveform in all channels
- Trigger timing looks OK,
  but there is difference between Board 1 and 2
  Cable length and trigger delay are different, but in one board everything is same.
- LeCroy FANOUT often distort pulse shape very hard.
- In this picture, DRS BOARD 2 channel 0 use inverter, not FANOUT.
  It looks much clear.

1st / November / 2005 (Tue.)

Rearrange channel assignment

		FANOUT	#10180 Gain (×10⁶)
DRS0 CH0	L7	P 0-0	0.52
CH1	L13	P 0-1	~~0.55~~ 0.54
Board1 CH2	R10	P 0-2	~~0.53~~ 0.52
CH3	R16	P 0-3	~~0.55~~ 0.48
CH4	L9	P 1-0	~~0.48~~ 0.53
CH5	L15	P 1-1	~~0.44~~ 0.54
CH6	R8	P 1-2	~~0.51~~ 0.41
CH7	R14	P 1-3	~~0.52~~ 0.49
DRS1 CH0	L8	L 0-0	
CH1	L14	L 0-1	0.55
CH2	R9	L 1-0	0.53
Board2 CH3	R15	L 1-1	0.51
CH4	L10	L 2-0	0.55
CH5	L16	Invertor	0.58
CH6	R7	L 1-2	0.48
CH7	R13	Invertor	0.50



START. Cosmic-ray ~~data~~ data taking with DRS.

#10182 ~ #10190 test and Junk data

4:34	Run 10191.	CR DRS	234 events	Board1 10 events stop
5:15	Run 10192	"	21	Board1 No event
5:21	Run 10193	"	354 events	Board1 314 events

6:12. Gas circulation stopped

I have not yet input FANOUT output into ADC & TDC.

I didn't check ~~&~~ data

I have not check mid files and root files. whether they are written properly.

* Something wrong happen, please restart frontend as root after reconnect USB cable. Board2 is very likely to fails initialization. In ~~f~~frequency setting, iteration comes to 99, it fails. Please kill frontend and reconnect USB, then try again.

6:19 Run 10194 CR DRS

something is wrong

chIP2-0, iter0: ···· 0 ~4095 0.00

chIP2-0, iter99: ··· 0 ~ 4095.0 0.0

1/Nov/2005

12:37 F16, F13 HV recovered

12:38 Cannot stop run frontend connection error

12:40 Stop #10194. 2213 events for Board 2
Board 1 231 events data were written

12:43	Run 10195	CR DRS	532 events	Board1 229 events
14:15	Run 10196	"	227	~~207~~
14:52	Run 10197	"	240	136
15:32	Run 10198	"	← Junk,	
15:48	Run 10199	"	279	256
16:59	Run 10200	"	176	~~75~~
~~17:31~~	~~Run 10201~~			

I tried exchange the USB mezzanine card between Board 1 and Board2.

Before exchange,
Board1 stopped to read waveform ~~@~~ in the middle of run.
Board2 often failed to initialize.

After exchange, these behavors are exchanged, so.
these problem ~~cause~~ are attributed to the USB mezzanine card.

17:31	Run 10201	CR DRS	Board1 103 events,	Board2 40 events
17:49	Run 10202	CR DRS	139	121
18:15	Run 10203	CR DRS	166	2
18:45	Run 10204	CR DRS	95	20

Total. 16 channels set data ~~1600~~ 1640 events
Board1 1961 events
Board2 4459 events

* I found that I made ~~mistake~~ mistake in setting of threshold.
Actually threshold for cosmic trigger PMTsum was set to 150mV
These data ~~should~~ contain not only CR but also environmental γ and so on.

1 / November / 2005

α with DRS

- trigger

  Only use Discri. 1 for usual α trigger

  Threshold was set to 275mV (6PMTs)

- PMTs

  This time 1 DRS Board use.

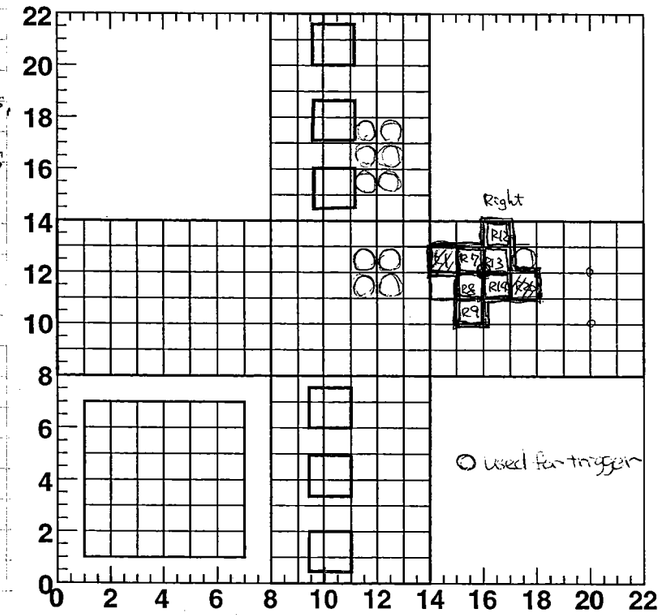
  8 channels

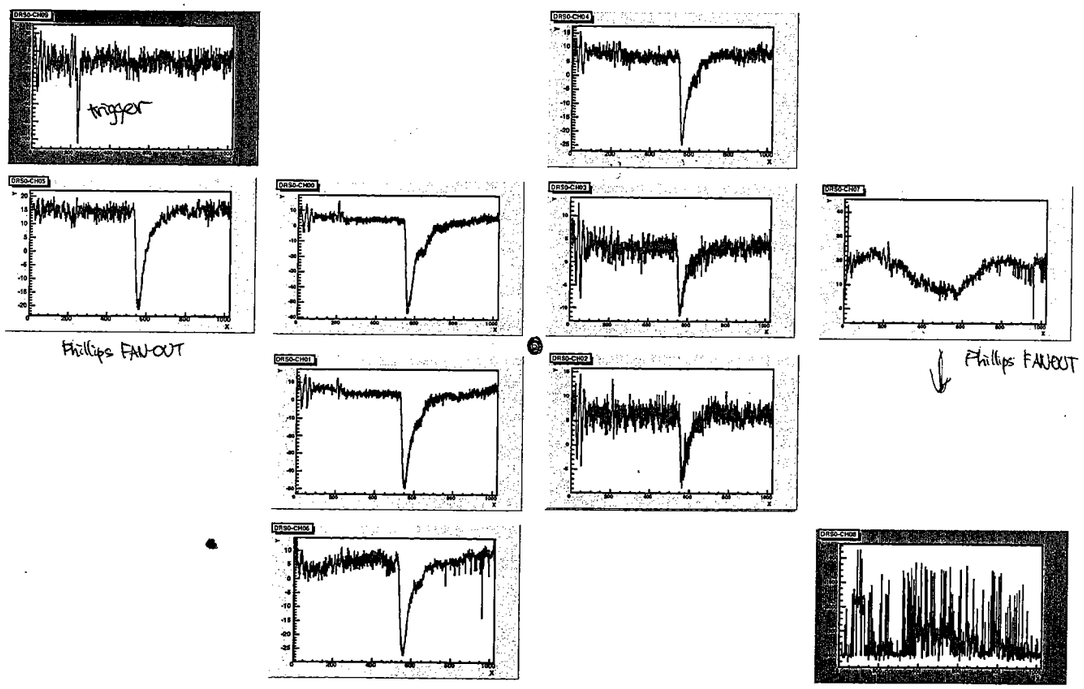
  Use Invertor for 6channels,

  PhillipsF/O for 2channels

DRS Board 1		splitter
CH0	R7	1-1-3
CH1	R8	0-1-3
CH2	R14	1-4-3
CH3	R13	1-3-7
CH4	R12	1-3-3
CH5	R1	1-0-7 FANOUT
CH6	R9	0-0-4
CH7	R20	1-2-3 FANOUT

Online monitor





1/Nov./2005

#10205 ~ #10210 Test run, Junk.

21:58 Run 10211 Alpha DRS.

It seems that we ~~can~~ able to take data safely to the whole during the run.

Online file
ROOT File data10211.root
contained tree "data_1"

2/November/2005

3:28 stop #10211 4148 events

3:27 Run 10212 Alpha DRS 5419 events

10:36 Stop #10212

Total 9567 events

COSMIC RAY with DRS

I mistook trigger threshold last time (10/31 ~ 11/1)
I try to take cosmic ray data again.

This time use DRS Board 1 only, 8 channels

- Trigger

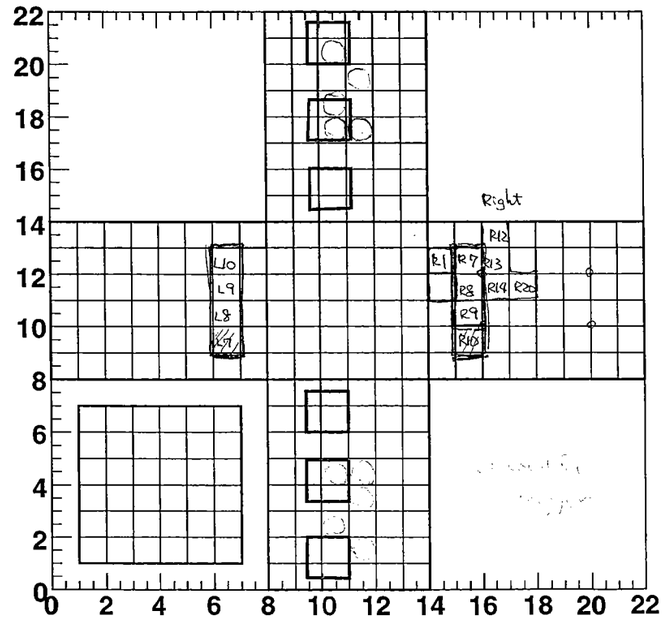
  Top and Bottom, 5 PMTs summed each.

  (Top sum) AND (Bottom sum)

  Threshold is -1.0V each

- PMTs

DRS Board 1			
CH0	R7	1-1-3	Invertor
CH1	R8	0-1-3	
CH2	L10	1-0-2	
CH3	L9	0-0-2	
CH4	R9	0-0-4	
CH5	R1	1-0-4	Phillips F/O
CH6	L8	0-1-1	
CH7	L7	1-1-1	Phillips F/O



2nd/November/2005

#10213 test.

11:23 Run 10214 CR DRS board 1

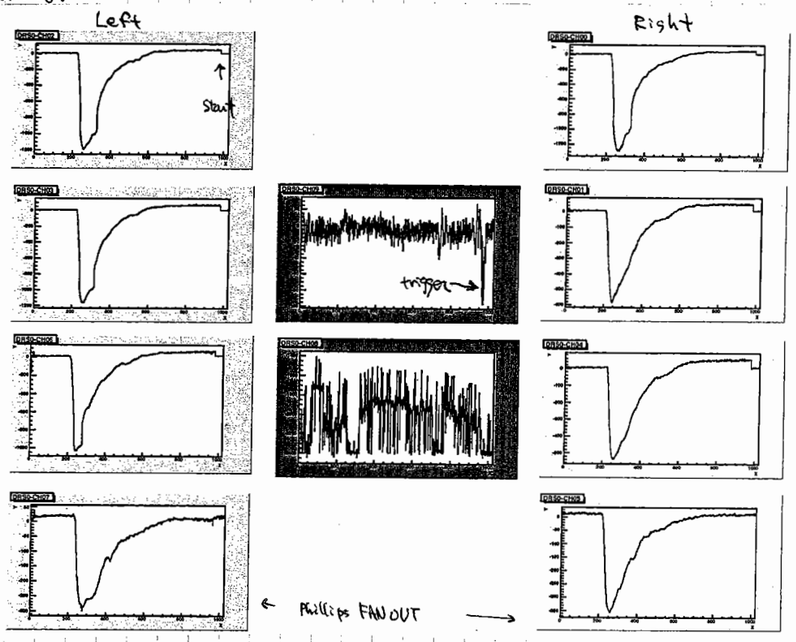
for test

trigger was changed during the run.

197 events

11:44 Run 10215 CR DRS board 1.

~~O~~nline monitor



For big pulse

- Under shoot is seen
- Over 1V. calibration is failed and pulse shaper look distorted
- Biggest pulses overflow

3/Nov/2005

1:49 #10215 stopped 8461 events

1:50 Run 10216 CR DRS 1 board.

10: Stop refrigerator

HV off.

OV filled with 0.5 atm N_2.

flow rate was ~9 l/m. too ~~fast~~ slow.

We decided to change the recovery line into 250 l xenon tank from regulator side to only valve side.

OV evacuated. & purification line also evacuated.

9.7×10^{-6} Pa.

22:30 restart. xenon recovery.

11/4

5:00 Alarm message from LabView!!!

5:25 Found. "LabView" is not operating.

connection to mscb ~~0~~ 3. un-readable., pressure gauge at the top of LP says "1.0 Atm" OK. → Problem of MSCB, not LP.

↓

Cable connection between

MSCB modules and PCs. is disconnected

⇓

reconnect cables

⇓

START LabView

⇓

OK.

5/11/2005

16:47. Liquid xenon level low was also 0.
~~Xe~~ recovery paused and α data in gas xenon will be taken.

SM top −93°
SM mid. 0.
SM bottom −71°
HL up −92.3°
HL low −91.3°
Cld Head 29.2°
minco −97.0°

Flow ~ 0.

Inner vessel pressure 0.164 MPa.

LN2 tank level 34%.

HV on. Setting 525 gain "051025_4.hv" loaded.

16:58 #10217 pedestal & junk
#10218 "

17:56 #10219 pedestal
17:59 #10220 LED (#2, #6)
(#2 127, 131, 135, 139, 143, 147
#6 88, 89, 90, 91, 92, 93)

18:13 #10221 α 126 k events

18:22 #10222 Junk

5/Nov/2005

18:23	#10223	gas α	57k events	0.162 MPa
18:32	#10224	α in gas	52k events	0.16 MPa
18:49	#10225			
19:09	#10226	α in gas	50k events	
19:19	#10227	α in gas		
19:27	During this run LeCroy1458 broke down. Stop the run. LeCroy1458 rebooted automatically.		45k events	
19:28	#10228	α in gas	50k events	
19:38	#10229	α in gas		0.157 MPa

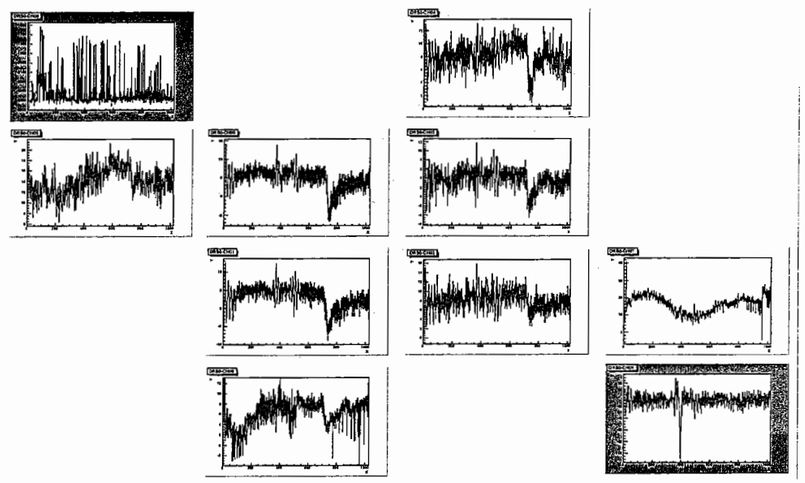
α in gas Xe DRS #10230 test

Setup ~~is~~ same as α in LgXe (1/Nov/2005) except for threshold (175mV, 4 PMTs)

20:22 #10231 α in gas DRS one board 1444 events

20:36 #10232 " 2074 events

online monitor



6/11/2005

0:05 · Manual operation mode for LP control
· Recovery still Stopped.

7:15 · Stop refrigerator
· Recovery mode
· Flow 2.4 l/min

Recovery restarted

12:00 Stop
Minco heater 0.002 MPa
Manual mode

12:10 Finish Xe recovery. 0.001 MPa
LP and Xe tank values closed.

17:00 We tested OV by leak detector.
because the pressure of outer vessel was 1.0×10^{-2} Pa
even when the turbo pump was on during PMT test.

He leak detector is connected to inner vessel. and
small amount of He is introduced into outer vessel.
but no leak was found.

So. the sealing between IV and OV is O.K.

IV N_2 filled 1atm
OV " 0.8atm

MINCO Heater temperature control mode [270 K].