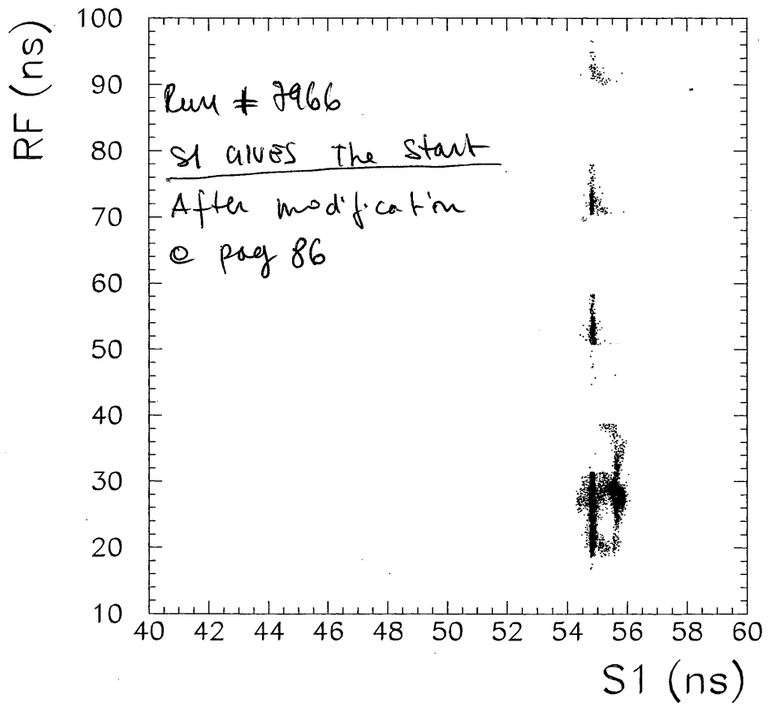
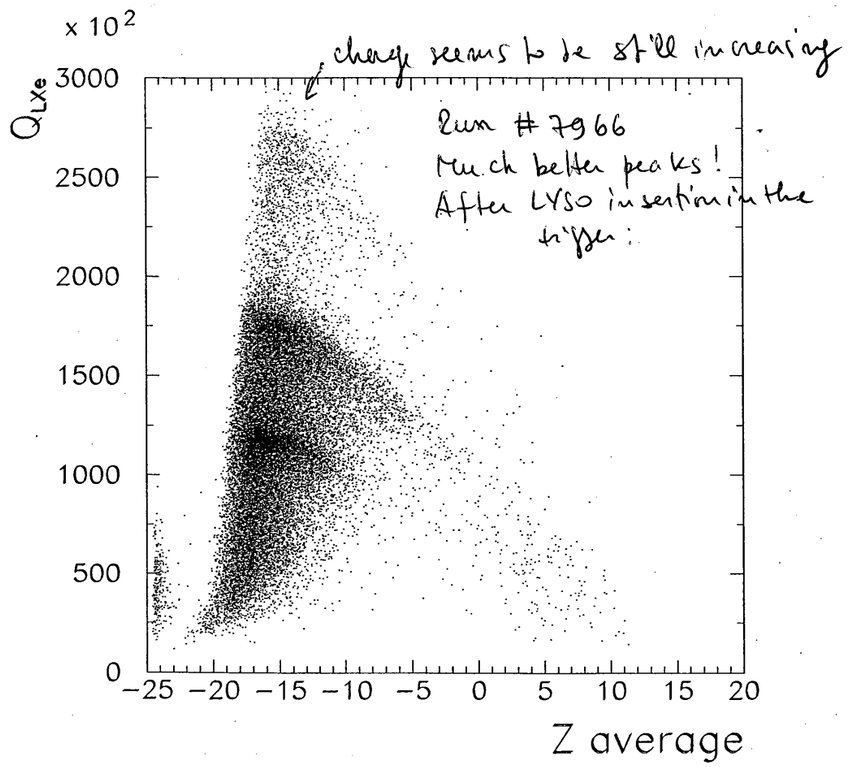
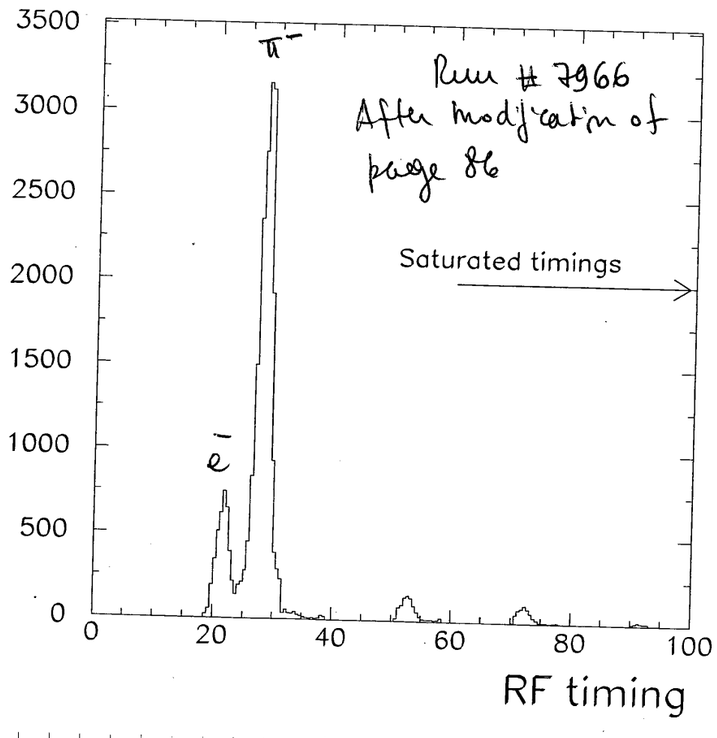
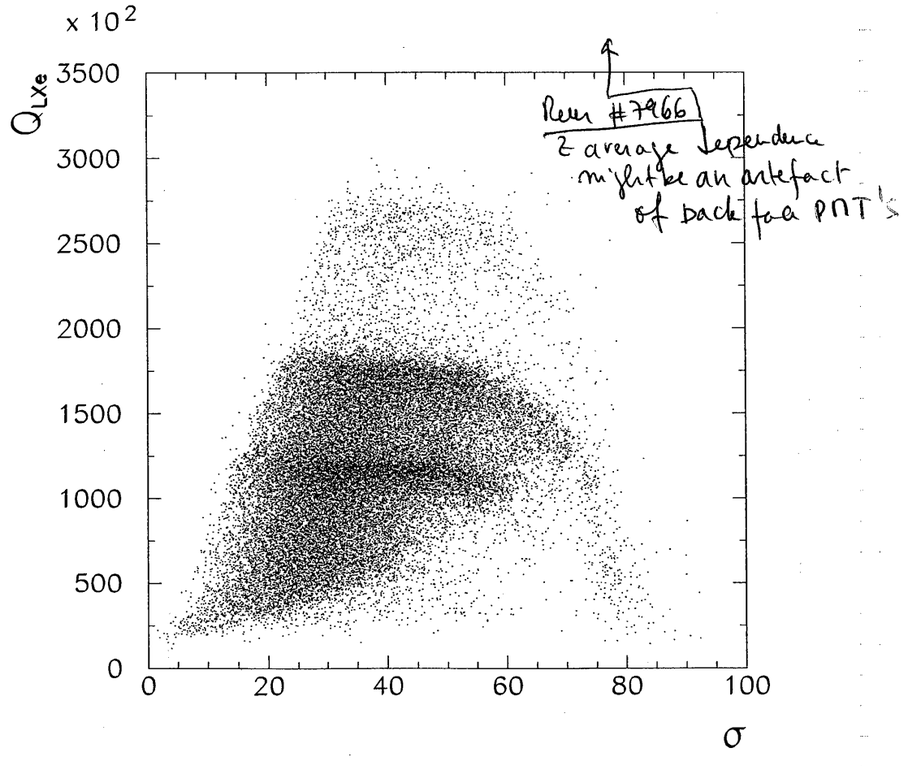




Qrest. ~ Qpdep ~ 1.06





Fotografato e portato a Pisa da qui 2/10/2004

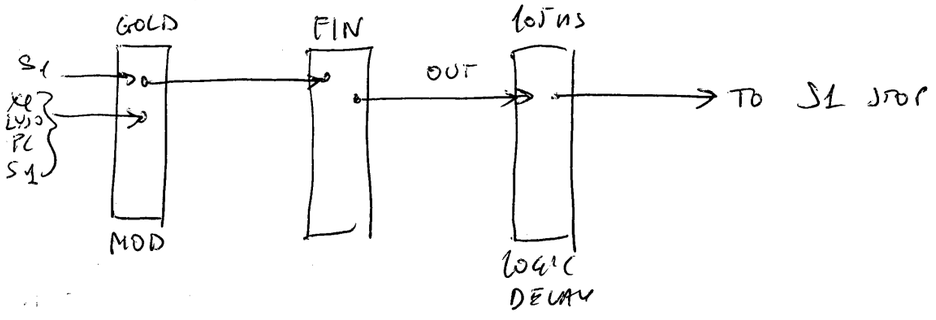
- LYSO 1 & 2 cables from MACRO fan-out to CAMAC ADC were modified / shortened

  ↑ discrimenator?

LYSO 1	FROM	32	TO	16 ns
LYSO 2	FROM	16	TO	6 ns

- S1 output was used also as the shaping time for RF signal, instead of 4-fold coinc. output

- the S1 – 4FOLD COINCIDENCE (golden module) sent to the 105ns logic delay sometimes forced to start, giving a double pulse in S1 spectrum (maybe coincidence OUTPUT was too short.)
  we ~~put~~ this output to a ~~free~~ logic fan in, and ITS OUTPUT to 105ns delay. This solves the problem



23:25 Run 7966 stopped

23:27 Beam Blocker closed for calibration

23:42 Run 7967 Pedestal } beam off

23:45 Run 7968 LED → BAD LED RUN ! Please check the ~~LED~~ LED behaviour after taking led data

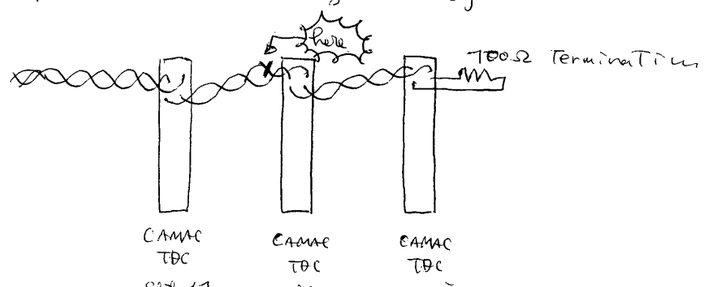
23:52 Run 7969 α

CAMAC TDC investigation (no data ?) with taking PiO data. In the next run. CAMAC TDC data will not be reliable.

0:55 Beam Blocker is opend

1:00 Run 7970 PiO Run.

Found that start signal daisy-chain cable was cut !!!



No start signal
Data was always 0

almost always same data

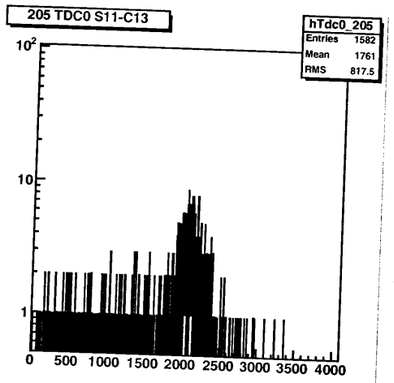
Seemed to be OK

- The cable is fixed and now we can see data in for all TDC modules.
- However arrival time of PMT signals are too late in TDCs slot 11 & 13 by ~~30~~ ~40nsec (about ~~6~~ 6~8m)

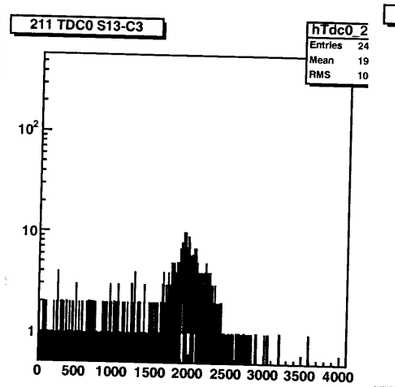
4:15 Cables for CAMAC TDCs in slot 11 & 13 are shortened by 6m.

OK now we can see TDC data in all CAMAC TDCs.

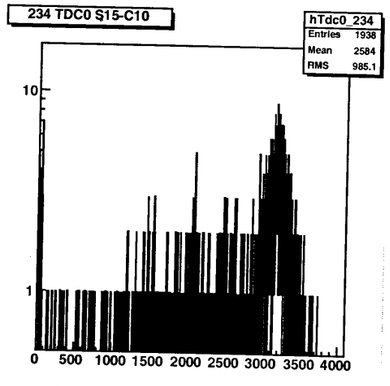
See the next page.



BK34
CAMAC.
SLOT 11
(Station)



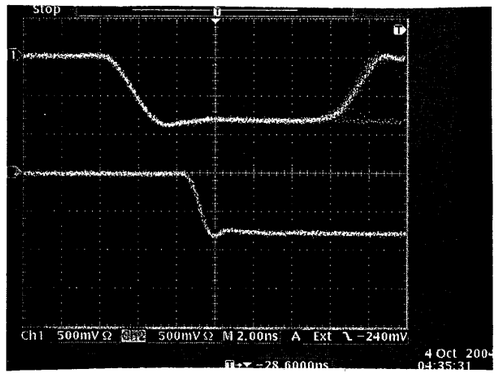
T35
CAMAC
SLOT 13
(Station)



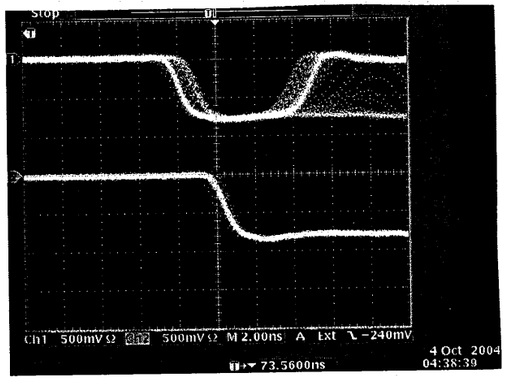
R41
CAMAC
SLOT 15
(Station)

4:42 Stop the RUN to investigate S4 & RF.

- Found that there is "1nsec" time jitter in S1 signal to TDC after the 105nsec logic delay. This caused funny shape of S4 TDC histogram as shown in the next page.
- This "1nsec" time jitter does not exist before the 105nsec logic delay. So, this is (probably) caused by signal shape to the delay input.
- Shown below are comparison of signal shape between "FIN" signal out shown in p90 and discriminator out generated by using Phillips discriminator instead of using "FIN"



Before logic delay

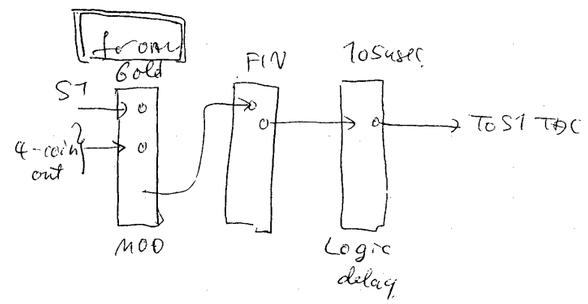


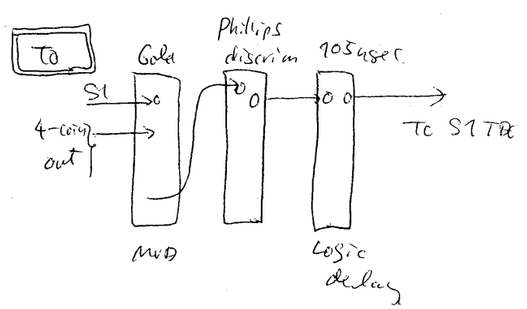
After logic delay

5:52 RUN7977 π^0 RUN

To check S1 TDC

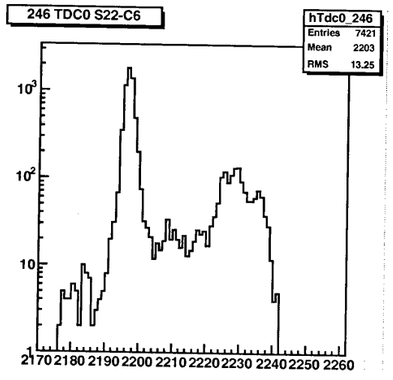
Before starting this RUN 7977, S1 TDC signal was modified.





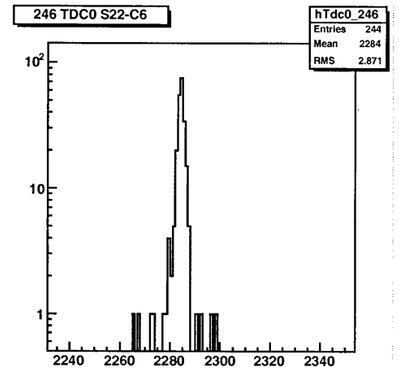
Now, S1 TDC histogram has a reasonable shape.

RUN 7970



[TDC channel]

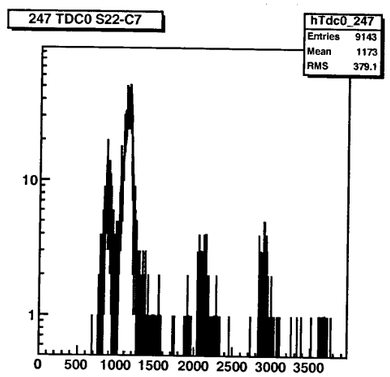
RUN 7977



[TDC channel]

4/Oct/04

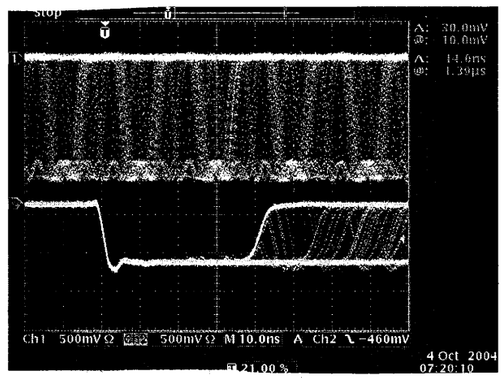
~8:40. Investigation of RF TDC.



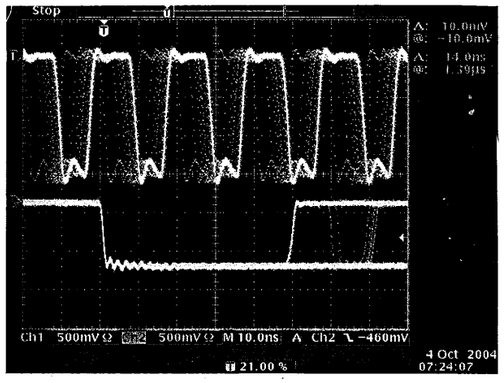
Found that this was due to short S1 pulse width at the 1st coincidence with RF (See diagram on P75)

Coincidence pulse width (and delay between modules) was adjusted.

Timing relation between inputs at 1st and 2nd coincidences is shown below



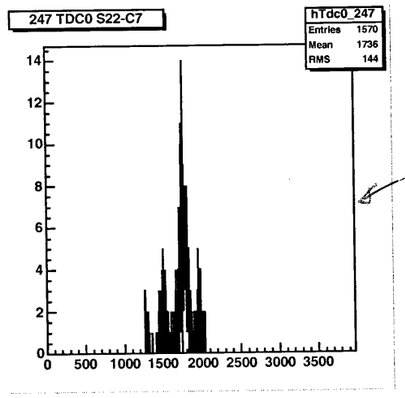
1st Coincidence



2nd coincidence

"S1" (Coincidence output on the previous page)
width is expanded by passing a discriminator

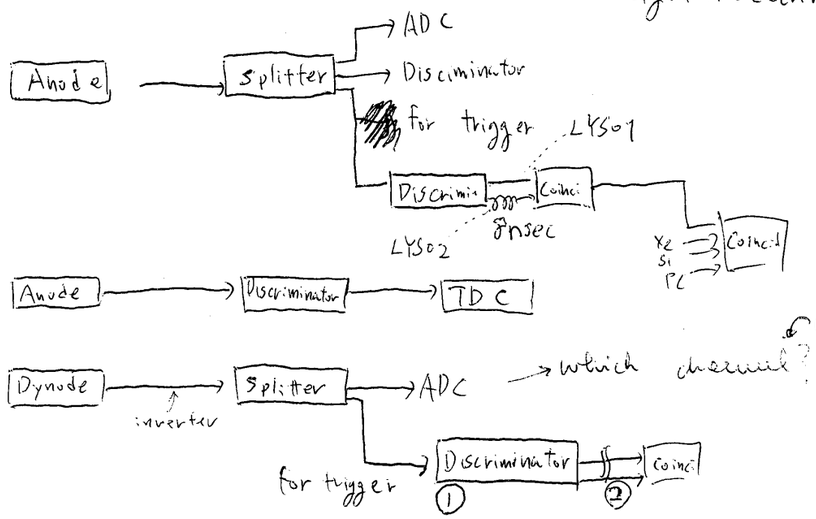
After this modification RF TDC is like... (next page)



There are still some overflow events
Not fully understood yet...

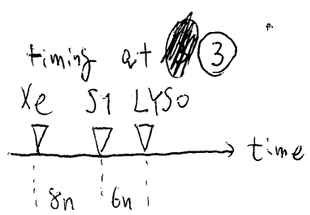
Change logic of LYSO to improve timing resolution with inputting signal into discriminator directly

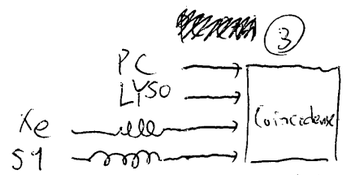
previous



New

- changed threshold level at ① from 500 mV to 250 mV
- removed 8n sec delay at ②

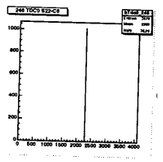




added 8nsec delay for Xe and S1
(because dynode signal comes ~16nsec later than Anode signal)

In Summary
- LYSO signal comes 8nsec later than before
- Xe and S1 signal come 8nsec later than before

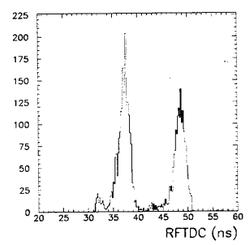
11:01 #7972 pi0



OK. trigger timing is determined by S1

S1 TDC

NOW RFTDC has 2 peaks ~ 20 ns apart.



ALL FASTBUS TDC'S ARE OVERFLOW !!

14:20 we try to look at γ-sources also with beam on

- We found large noise in S1 signal
  Effective threshold was a bit higher because of this noise (for S1) ~ 50mV p-p
- This noise was due to the ground loop related to the fact that RF and proton current signals are taken from the Peter's counting house.
- We decided to take RF and proton current signals directly from the pannel in the cave.

  ⇒ · Noise was reduced down to ~20mV p-p

20:28 # 7975 π^0 run S1 * Xe * LYSO

▷ Rate problem

- The trigger rate of π^0 run (S1 * Xe * LYSO) is now ~ 5HZ

while the expected rate is ~ 100 HZ (at least)
from the Peter's estimation.
⇒ a factor of 20 lower !!

- We measured the trigger rate at different conditions (request rate)
  - S1 * Xe ⇒ 88 HZ
  - S1 * LYSO ⇒ 86 HZ
  - S1 only ⇒ 21 MHZ ⇒ consistent with Peter's measurement.

π stopping rate is expected to be ~ 10^7 HZ (10 MHz)

- expected rate ~~for S1 * Xe~~

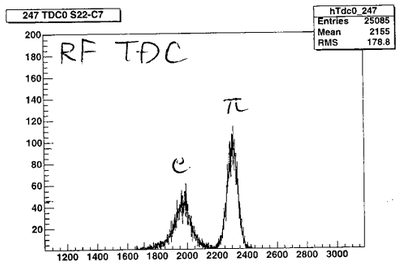
$10^7 \times \frac{\pi \times 5^2}{4\pi \times (415\,cm)^2}$ = 4.7 KHZ ? for S1 * Xe * trigger efficiency

~~cancel~~ $10^7 \times \frac{5 \times 10}{4\pi \times (115\,cm)^2}$ = 3 KHZ × trigger efficiency for S1 * LYSO (~15%)

2~8/10 Run# 7977 π^0 run S1 * Xe * LYSO.

~~Scaler~~

- We slightly modified RF timing after rearrangement of the RF cable to solve the S1 noise problem.



⇒ · e/π clearly separated
· No overflow event
· Since run # 7975

CAMAC SCALER input. @ CURRENT SETTING

Ch #	
0	dead
1	trigger request
2	trigger accepted
3	S1
4	α trigger rate
5	proton current

23:40 RUN 7978 π^0 RUN (S1*Xe*LYSO)

- Circulation was stopped for 20 minutes in this RUN to investigate refrigerator behavior
- Scaler signal was checked during this data taking

2:50 RUN 7978 end

5/Oct/04

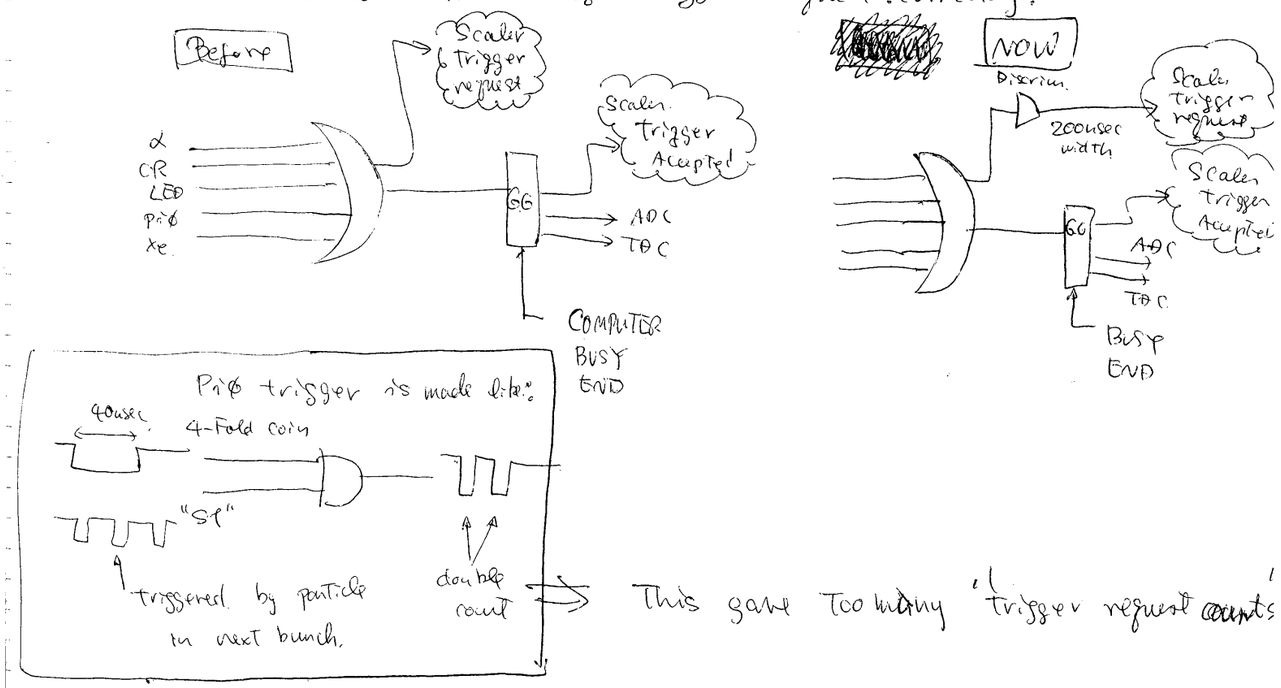
2:52 Beam blocker closed for calibration

2:54 RUN 7979 Pedestal
2:56 RUN 7980 @ LED
3:07 RUN 7981 @ α (16.7Hz) } beam off

DAQ rate

The CAMAC scaler can count up to 24 bits ($\approx 7.67\times10^7$)
Because of this, beam intensity higher than 7.67×10^6 Hz cannot be counted in the scaler read out procedure adopted now (read out every 10 seconds). We need a special electronic to down scale before putting into the CAMAC scaler

· SCALER input signal (CAMAC scaler) was modified to count number of trigger request correctly.



This gave too many 'trigger request counts'

RUN 7982 No data SORRY...

5 Oct 04

5:25 RUN 7983

LYSO off RUN to check trigger rate.

S1 & Xenon only

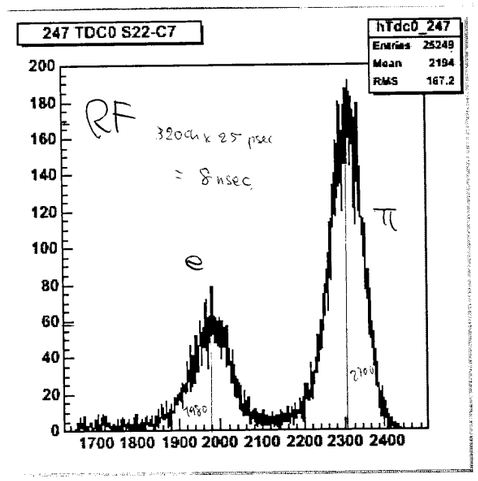
trigger Request 39k / 10 sec = 3.9 kHz

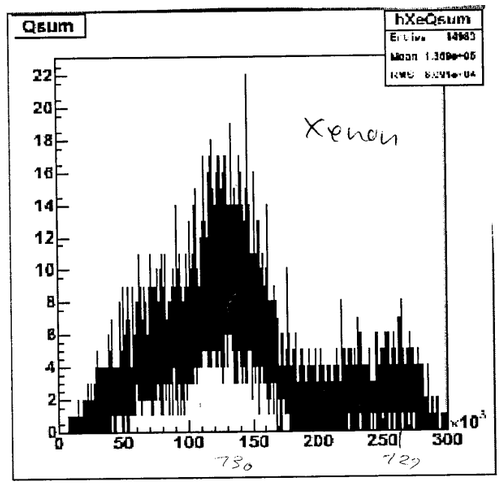
trigger Accepted 835 / 10 sec = 83.5 Hz

↑

limited by DAQ speed 10 msec/sec

S1 beam rate 22MHz





730 + 727 = 1457

π/e ratio seems to be higher than π⁰ trigger RUN

take xenon off RUN for comparison.

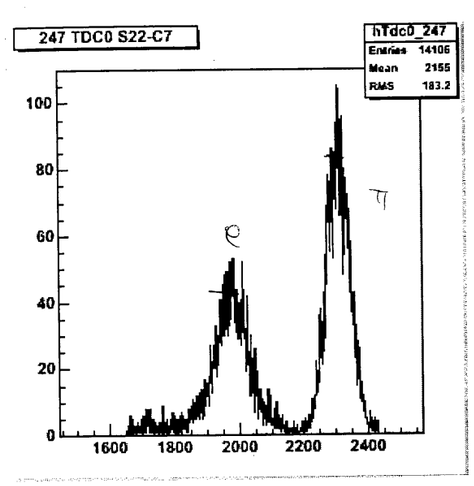
5:49 RUN 7984

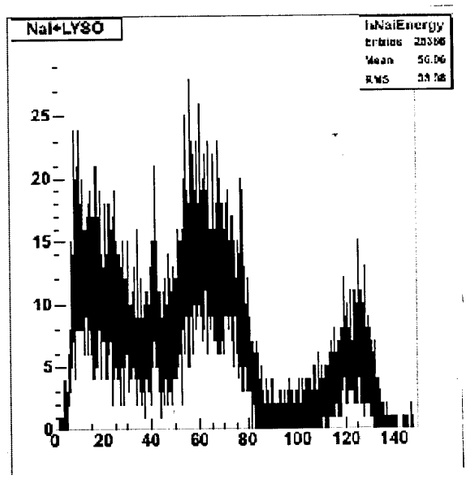
Xenon off RUN

trigger Request 76 k / 10 sec = 7.6 kHz

Trigger Accepted 843 / 10 sec = 84.3 Hz

S1 beam rate 22MHz



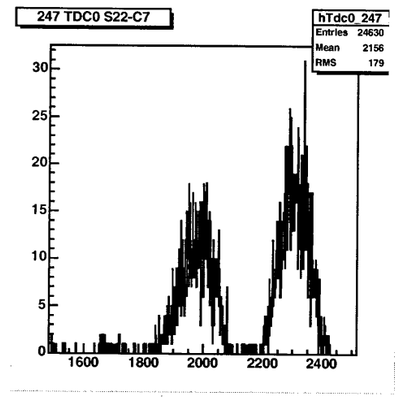


6:17 RUN 7985

LYSO off - xenon off

S1 alone trigger

It can be seen that about half of beam particles are electrons



It seems that "trigger rate" written on p97 is "trigger accepted rate" and that the rate is not so strange.

TRY low beam intensity run. to understand trigger rate more

change slit setting	FS4-L-R 80 → 70

Beam rate reduced from 22MHz to 8MHz

6:42 RUN 7986.

π⁰ trigger with lower beam intensity

TRIGGER RATE 1.7 ~ 2.0 Hz 8 MHz almost 1/3 of usual RUN

FS41 -L,R 70 → 80

put lead bricks ~~in~~ between refrigerator for target and Xe

12:18 #7988 pedestal @ beam on

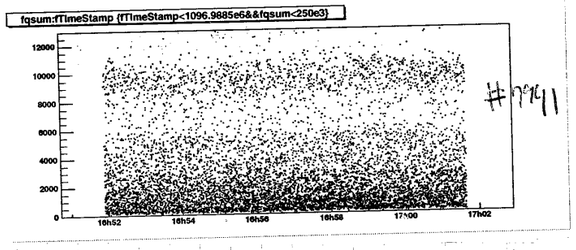
#7989 pedestal @ beam ON Lead brick added in front of Xe collimator

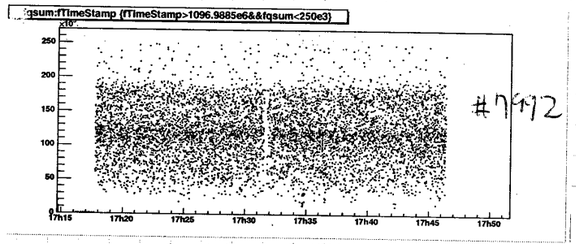
#7990 pedestal @ beam ON Lead brick added in front of TC window (brick in front of Xe collimator removed)

17:00 #7991 α-run 1 minute after closing beam shutter

17:15 #7992 π°-run beam shutter opened after 1 min.

17:45 Stopped run #7992





: We added degrader plate outside the TC cryostat to measure the range curve.

- The optimum thickness ~~is~~ which gives maximum rate is found to be 20 + 3×3.3 = 29.9mm. (Original thickness is 26.0mm)
- ~~It is a bit thicker than~~
- The original thickness is not far from the optimum one anyway
- The low rate is NOT due to stopping distribution in the target

03

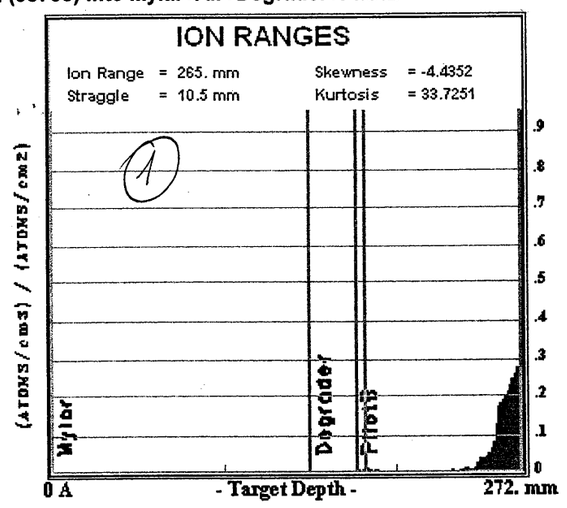
P-R K

Rough Range Curve

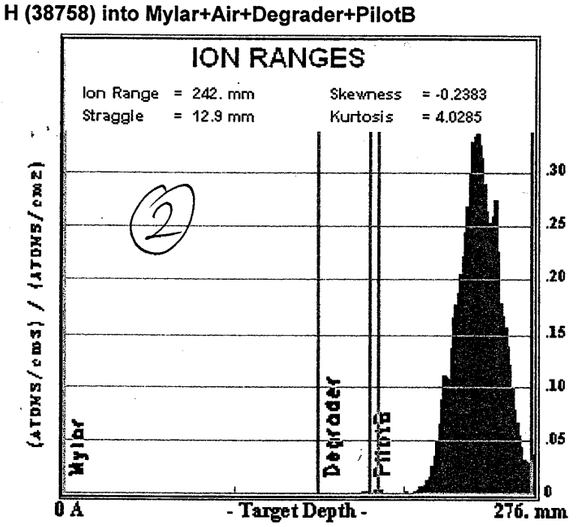
FIXED Degrader : 20 mm + 2×(3.3 mm) = 26.6 mm.

Deg	S1 all [Hz]	Trigger Rate [Hz]	S1·LYSO [Hz]	S1·CsI(Tl) [Hz]	
20 + 2	20.78M	4.5	1720 Hz	6480 Hz	①
20 + 3	20.76M	6.2/6.3	2000 Hz	5500 Hz	②
20 + 4	20.83M	4.1	1300 Hz	3200 Hz	③
20 + 5	20.90M	0.7	384 Hz	1260 Hz	
20 + 6	20.84M	0.05	230 Hz	940 Hz	

H (38758) into Mylar+Air+Degrader+PilotB

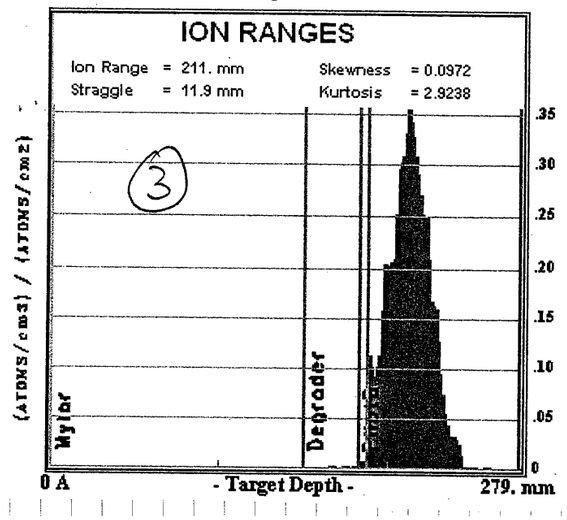


H (38758) into Mylar+Air+Degrader+PilotB

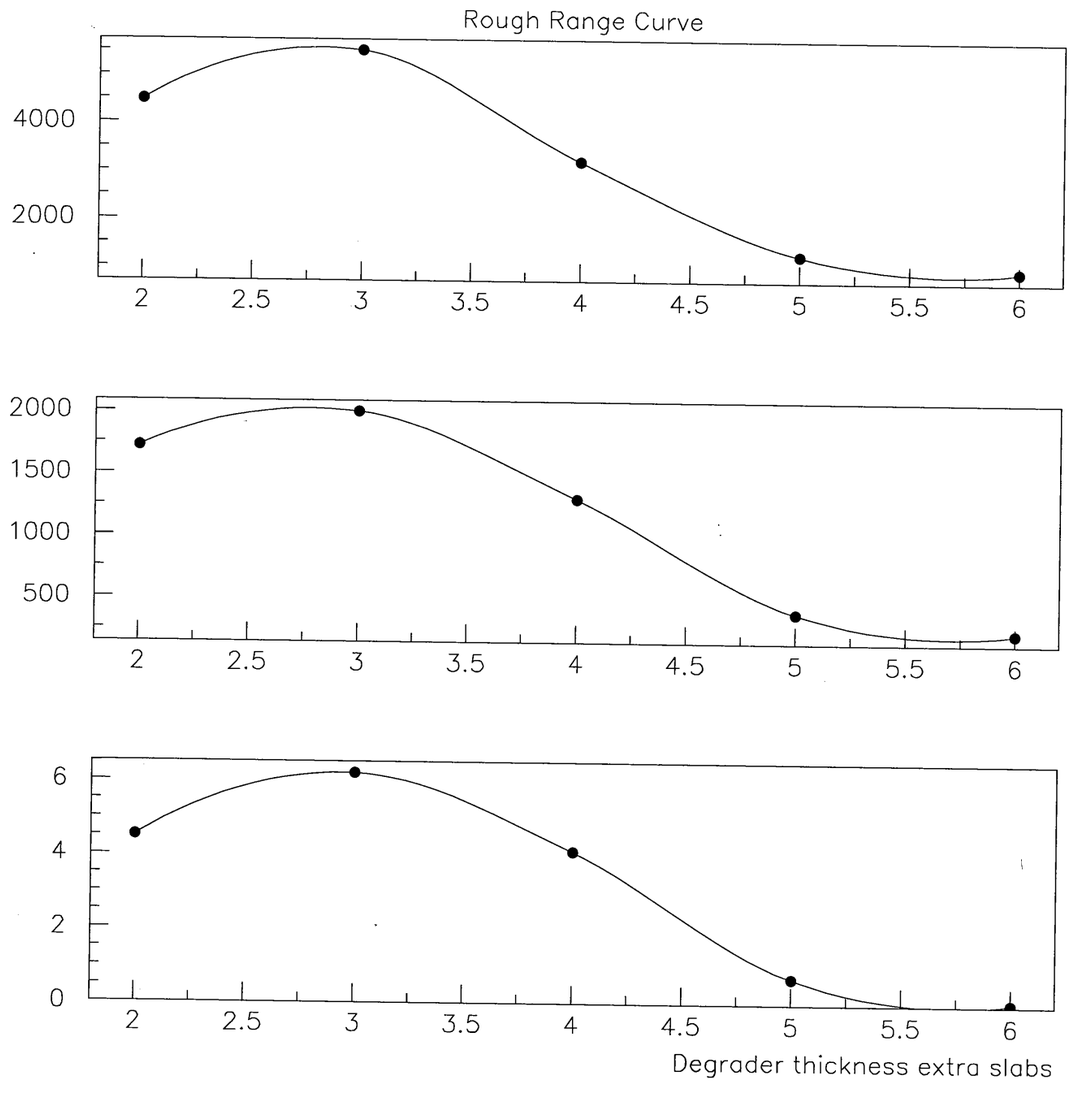


N.B.
No Target
Kapton Window
included

H (38758) into Mylar+Air+Degrader+PilotB



2004/10/05 16.49



- We measured the rate of the coincidence between...

  LYSO & Xe ⇒ ~ 5 HZ ⇒ Detection efficiency of LYSO is lower than expected?

  NaI & Xe ⇒ ~ 30 HZ

  ⇒ Try S1 * Xe * NaI instead of S1 * Xe * LYSO

19:30 No beam since ~18:30 because of vacuum trouble in Inj 2. (Next message @ 21:00)

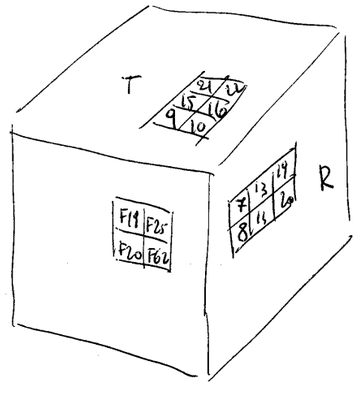
⇒ No beam till Thursday.

Things to be done

- Lower the PMT gain 0.5×10^6 ?
- Add the degrader plate inside the target cryostat
- Set-up S1 * Xe * NaI trigger.
- Check the target cell alignment in the cryostat.
- Check the trigger rate with the TC partially filled.

22:00 Check of the α-source trigger (Giovanni / Angela)

We checked the signal amplitudes for α-source in the channels for the top-right-front alpha source.



The signal amplitude for this source is

F20	120	mV
F25	160	mV
F19	160	mV
F26	160	mV
T9	150	〃
T10	140	
T15	130	〃
T16	130	
T21	60	
T22	150	〃
R7	150	
R8	100	〃
R13	140	
R14	120	〃
R19	55	
R20	70	〃

The CAMAC discr. threshold is set to 10 mV
And the multiplicity threshold is set to 75 mV.
(i.e. 2 PMT for patch above threshold).

We decide to set this threshold to 575 mV,
i.e. at ~~least~~ 12 channels over threshold by
inspecting the multiplicity signal on the the
scope. FOR THE 4 α-SOURCES "FRONT"

4 α-~~sofes~~ SOURCES "BACK" UNTOUCHED.

RUN 7993 PEDESTAL B. OFF.

RUN 7994 GAIN BEAM OFF

RUN 7995 α-run with beam off.
→ multiplicity front for α set to 575 mV
instead of 75

22:50 Run 7995 stopped after 30 000 events.

The front four sources are still seen and the bckgoud is reduced.

2345 Run 7996 LECROY CAMAC DISCR. THRESHOLD CHANGE
FROM 10 mV TO 30 mV for DISC 0,1,2,3

23:50 Run 7997 Multiplicity changed to 475 mV for 0,1,2,3

Check of pedestal distribution with beam-on condition
& trial to stack lead bricks to stop "background"

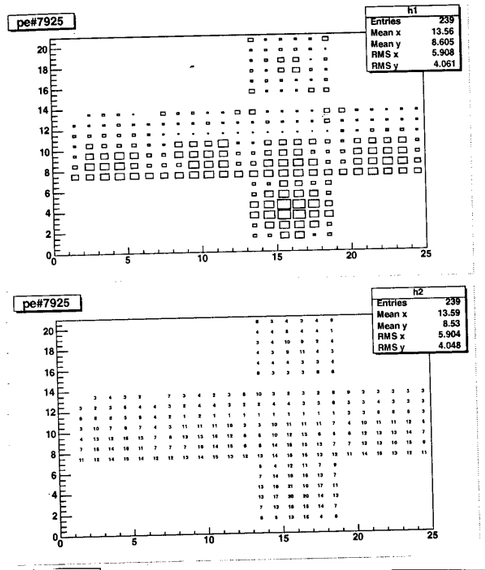
σ of each PMT's pedestal

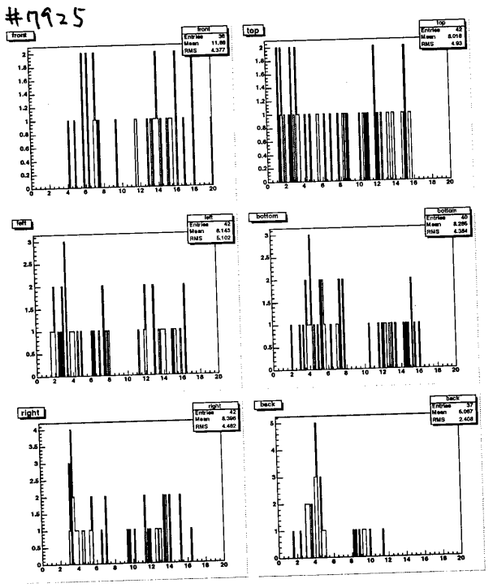
↓

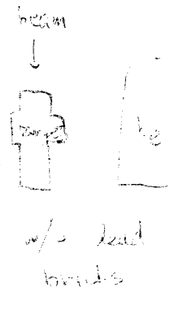
distribution of σ of each PMT's pedestal
for each face

⚠ W/O beam, they are always less than 5

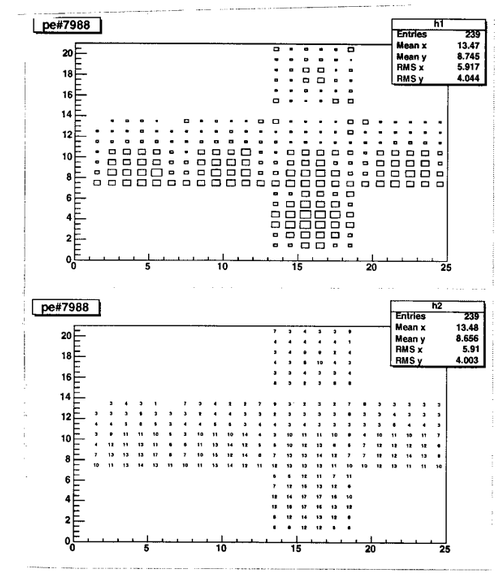
#7925

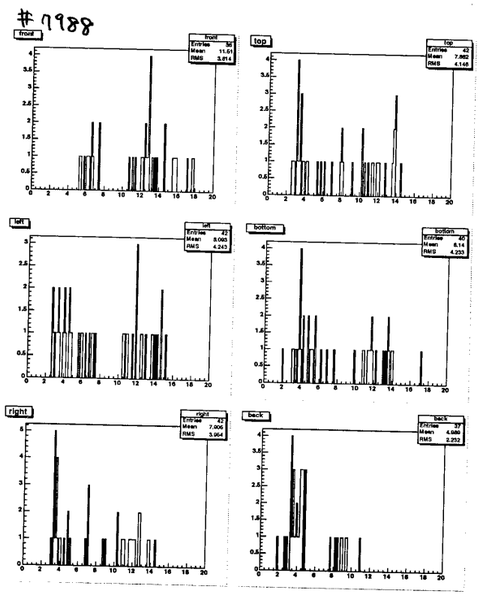


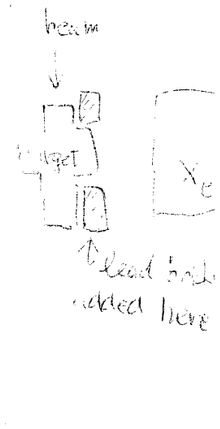


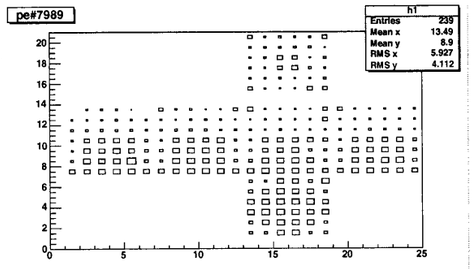


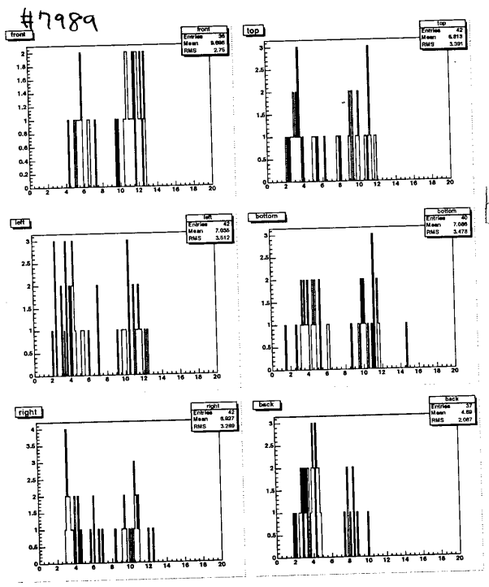
#7988

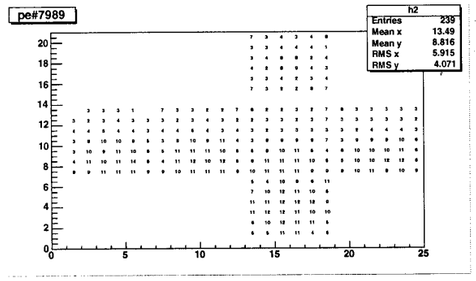


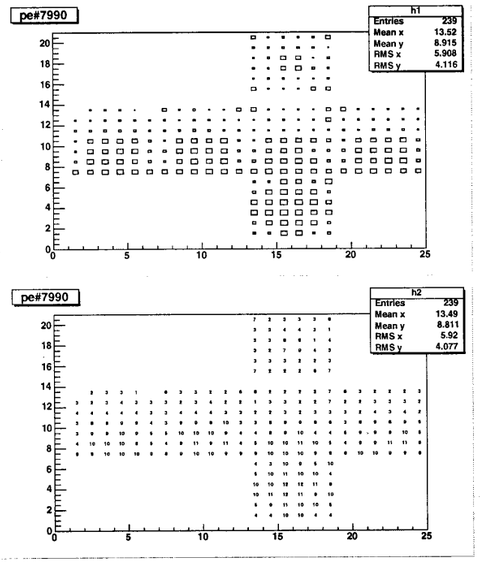


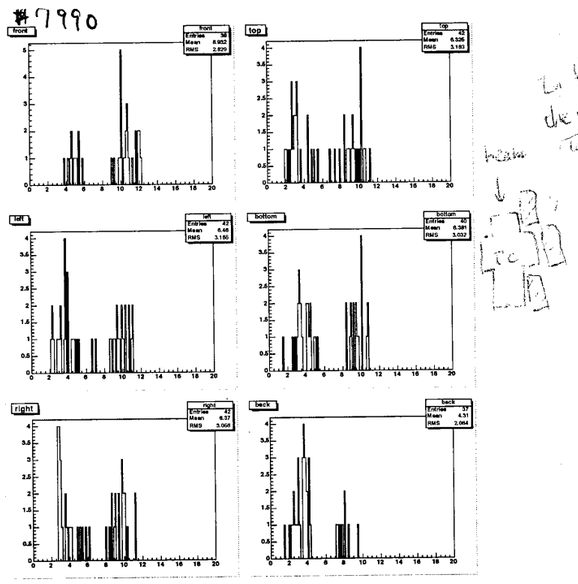




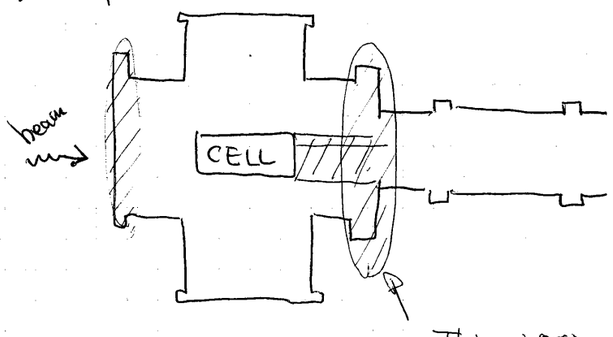








Activity on the target chamber surface measured



This region is rather hot 5 μSv/h.

Most probably because beam electrons stopped at this flange.

06/Oct/2004 109

gain adjustment { R6041Q → 1e6 / R9288 → 5e5

0:20 #7998 pedestal for gain adjustment

changed ADC minicards to fix ~~large~~ broad pedestal distribution and too small pedestal mean

(13-54 / 13-55 / 11-38 / 11-39 / 11-33 / 11-57) reference card of board 11, 13 was also replaced.

but there are still problems.

{ broad pedestal 153, 207, 240 / always 0 129, 152 } ⇒ to be fixed

I changed wrong minicards because channel in amtable.jpg starts from 1 while channel in Table starts from 0

there must be good minicards in that I removed.

Interrupt gain adjustment until we fix bad channels listed above gain is not adjusted yet. That is still ~1e6

- #7999 ~ #8002 Pedestal for gain adjustment.

Gain adjustment and bad channel fixup will be done tomorrow (Today) again.

3:45	RUN 8003	Pedestal	beam ff
3:46	RUN 8004	LED	=
3:53	RUN 8005	α	=

Too low DAQ efficiency ??

This α RUN data is taken with modified trigger setting described on p106. TRIGGER RATE 1kHz?

6/08/04

4:45 RUN 8006 CR. beam off still.

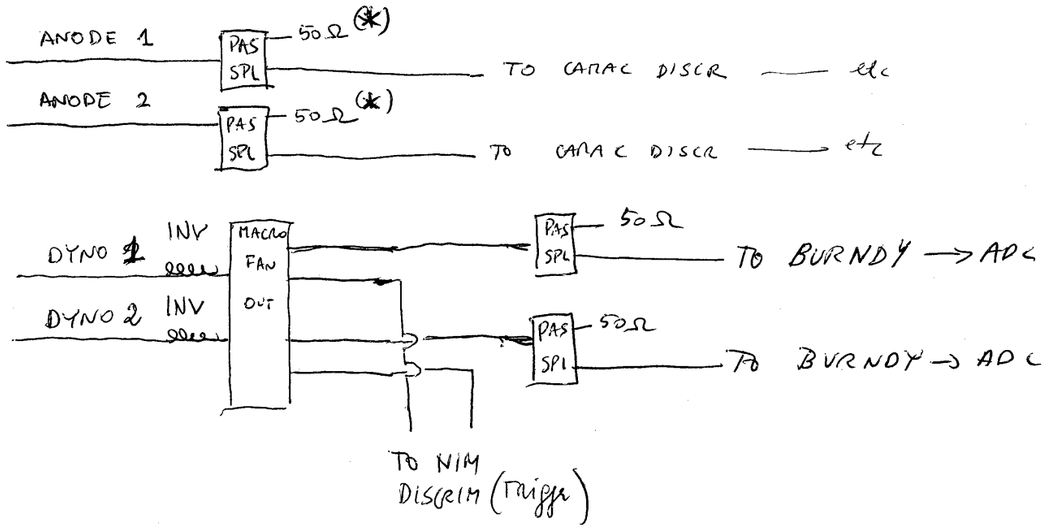
12:30 CONCERNING LYSO TIMING.

LYSO timing resolution, estimated as $\sigma\left(\frac{LY1T - LY2T}{2}\right)$ is not particularly good (~100 ps after correcting for T-W and position)

To investigate this problem we do the following things:

1) Increase LYSO HV: LYSO 1 FROM 1820 TO 1950 V
LYSO 2 FROM 1920 TO 2050 V

This way the signals are too high, hence we include 2 passive splitters for the anode signal and 2 passive splitters for the dynode signal



The two anode signals marked (*) presently terminated at 50Ω are planned to be NIM discriminated and then fed to the 105 ns logic delay and then to the same CAMAC TDC as S1, since we know, from the S1 width (appox 30 ÷ 40 ps), that this procedure preserves good timing characteristics, with respect to the long delay cable, which introduces some time smearing. In the case of LXe this smearing is negligible (if uncorrelated on all TDC channels, since it scales as $1/\sqrt{N}$) but in case of LYSO (only 2 channels) is dramatic.

4:24 stop 8006

See P103 ← 3.3 mm plate added. Total thickness is 29.9 mm

Changed degrader in front of the Target to thicker one in that it stops at the center

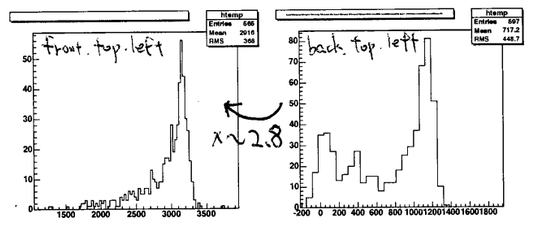
14:20 Target Cell precooling start

- Changed some wires in ADC 13, 14
- I found that delay cable corresponding to 9-48 is out somewhere, so I moved Burndy Box BK27 to Burndy 5-48 (ADC 287)

⇒ all problems written in page 107 is fixed but there are weird peaks in Channels in ADC 9

⇓ solved see page. 114

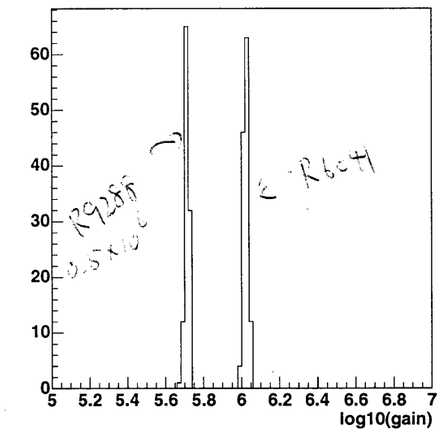
Qsum of 12 nearest PMTs to α Source



	#8009	Junk
16:28	#8008	pedestal for gain adjustment
16:32	#8001	LED for gain adjustment (junk)
		Updated SQL Database
16:48	#8010	LED for gain adjust
16:49	#8011	"
16:55	#8012	"
17:05	#8013	"
17:09	#8014	"
17:17	#8015	"
17:24	#8016	"

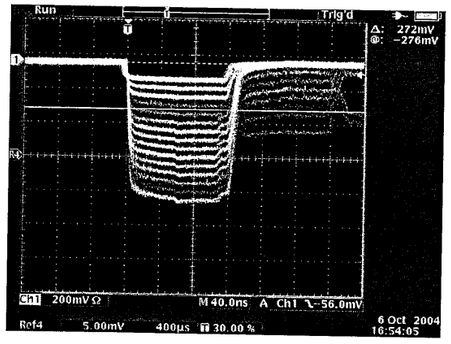
save HV setting as 0410 06 hv

gain distribution

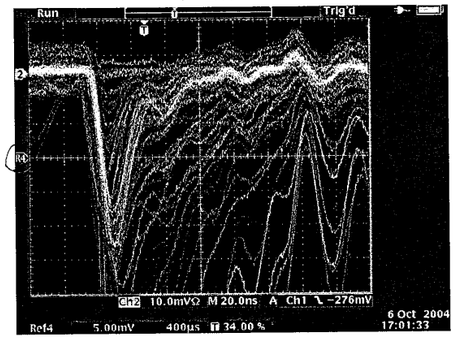


After changing the PMT gain we have to reset the α-trigger. 113
The first plot shows that 30 mV is ok if we require a multiplicity of 275 mV i.e. 6 channels.. The α-peak on F20 is the plot at left.

CAMAC THR : 30 mV



F20



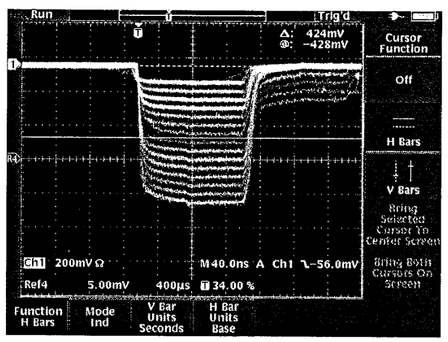
SOLUTION I

non-α

In this way we have a handle to reject events at beam on by requiring multiplicity < 15

Another option is lowering the threshold to 20 mV on CAMAC And put the multiplicity to 425 (i.e. 9)

CAMAC THR. 20 mV



SOLUTION II

We implement for the moment solution I.

2004-Oct-06

#8017 pedestal beam off

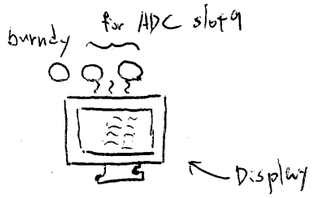
#8018 α 30mV threshold. ≥ 6 multiplicity

#8019 LED.

19:26 #8020 CR.

22:05 stop#8020

Broad pedestal problem of APC is solved



the problem was Display when I turned off it. pedestal becomes sharp.

So I moved display far from burndy and turened it off.

8021~8024 2unk

#8025 LED
#8026 pedestal) ⇒ gain is slightly smaller than target.

HV adjust again

#8027 pedestal for gain adjust

#8028 LED 〃

#8029 〃

#8030 〃

→ Save as 041007.hv

⇒ Load 041002-2.hv (all led) to compare trigger rate in ~~with~~ same condition as before

2004-Oct-7 115

2:00 Target Cell ~95% Filled. Temp. Setting Changed to 19K

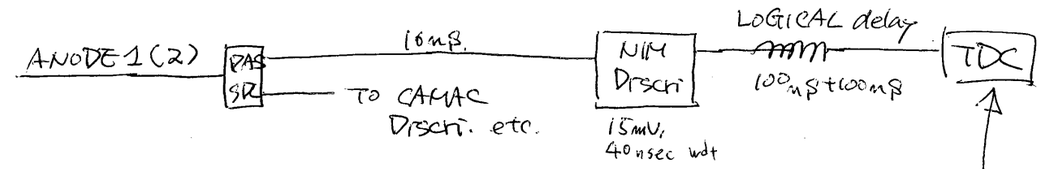
#8031 pedestal beam off

~~#8032 LED beam off~~

#8033 π0 Junk.

#8034 π0.

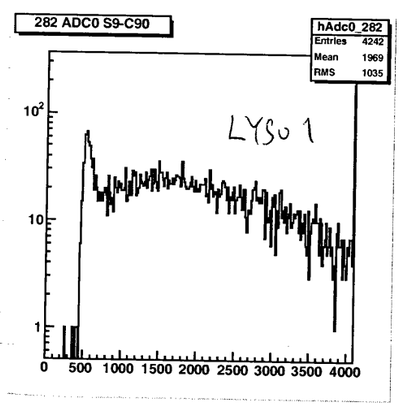
Modified LYSO-ANODE connection as described in pp. 111.

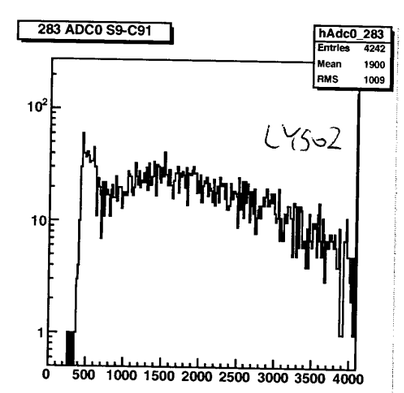


04:09 #8035 π0. beam ON.
2288 events/8min = 4.8 Hz.

TDC# 248 for LYSO 1
249 for LYSO 2.

~~TDC~~ TDC # 238, 239 are ~~kept~~ kept as it was for LYSO1, LYSO2 via CAMAC Discri & cable delay.





Attennation for LYSO ADC is not still sufficient.

⇓

more attenuation should be applied.

2004 Okt 07

5:20 #~~8036~~ 8036 pedestal

#8037 LED ← N.G., because of high gain?

#8038 α

6:35. Beam Blocker closed.

#8039	pedestal	beam off	
#8040	LED	beam off	← LED 5th, 6th steps were a little bit unstable.
#8041	α	beam off	

~7:00 I found that hv ch 0-1-6 was trippped. → enabled. (R3, ADC #15)

7:10 Load 041007.hv (5×10^5 gain for R9288s)

Beam Blocker OPEN

	#8042	pedestal	beam ON.
	#8043	LED	"
7:24	#8044	α	"
7:35	#8045	π^0	beam ON.

trigger rate 1528 event/9min = 2.8 Hz

The lower trigger rate is due to the lower (5×10^5) gain for R9288 PMTs.

↳ Threshold for Xe ~~trig~~ (16 PMT sum, CAEN discri) lowered from 0.835 V ~~to~~ 0.625 V. during the run.

7:58 #8046 π^0 beam ON.

879 event/4 min = 3.7 Hz.

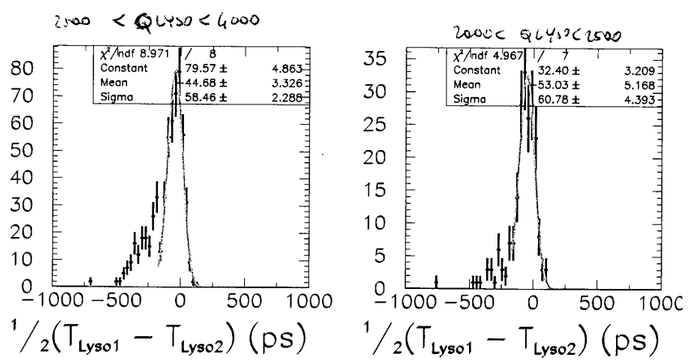
The gain calibration with beam on doesn't look great..

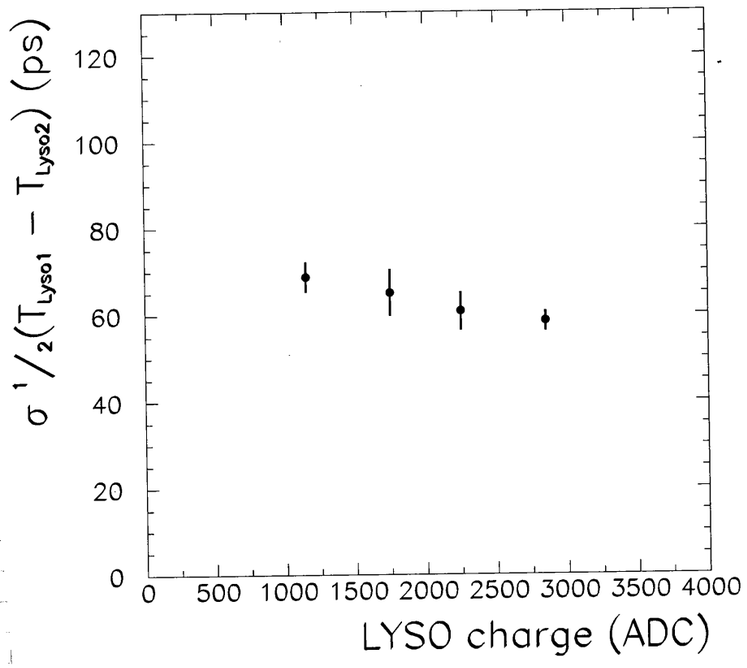
It is found that S1 cable to the MACRO FANOUT is disconnected !! Since when? ⇒ should be checked.

10:01 #8047 π^0 S1 * Xe * LYSO

The trigger rate is now ~ 8HZ @ a1.7mA proton

12:30 a preliminary analysis of LYSO Timing in run 8047 shows that it is better than before:





VERY PRELIMINARY!!

Corrections for position - time jitter - - asymmetry - not optimized. Some cuts applied.

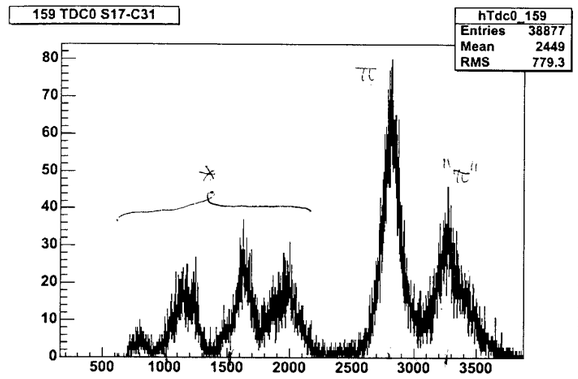
12:47 #8048 π^0 RUN

14:10 Plenty of Warning Messages "No ADC gate! ... "
This was due to wrong flip-flop setting for ADC gate in this RUN. Probably all data in this RUN cannot be used for analysis.

14:12 End of this RUN

14:29 #8049 π^0 RUN

The run was paused several times to investigate the TDC problem.

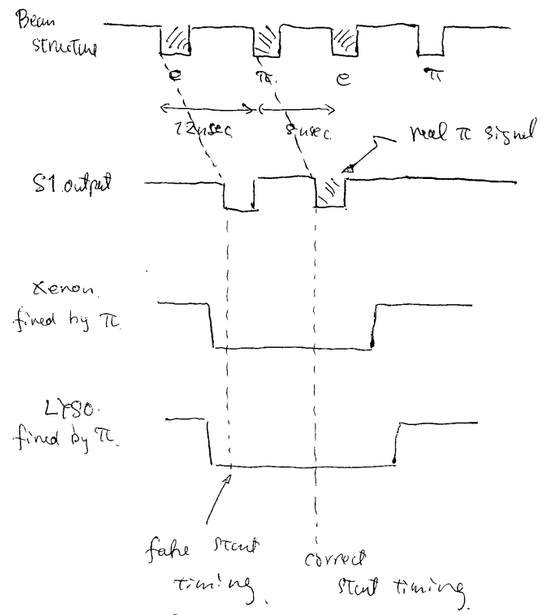


KUNS047 TDC 159

Multiple TDC peaks started to appear from around RUN 8047.

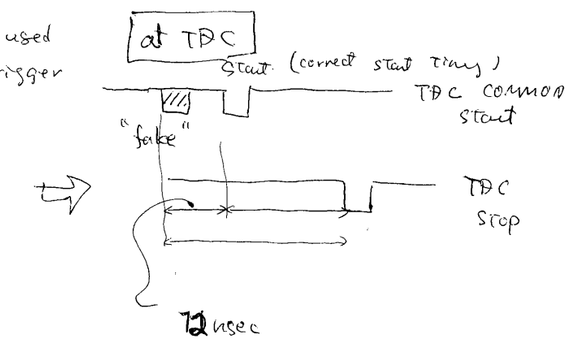
Peaks around * region is due to mis-trigger timing of the coincidence caused by some signal reflection inside the circuit.

Peaks indicated "π" is due to pile-up in S1 by electron in the same bunch.



To be used for trigger

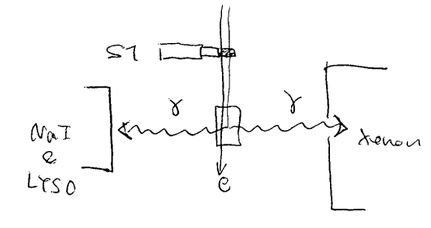
at TDC



Because of this fake signal, TDC second peak appears.

(Not sharp! because sometimes the timing is determined by Xenon or LYSO)

This case RF timing appears at e timing.



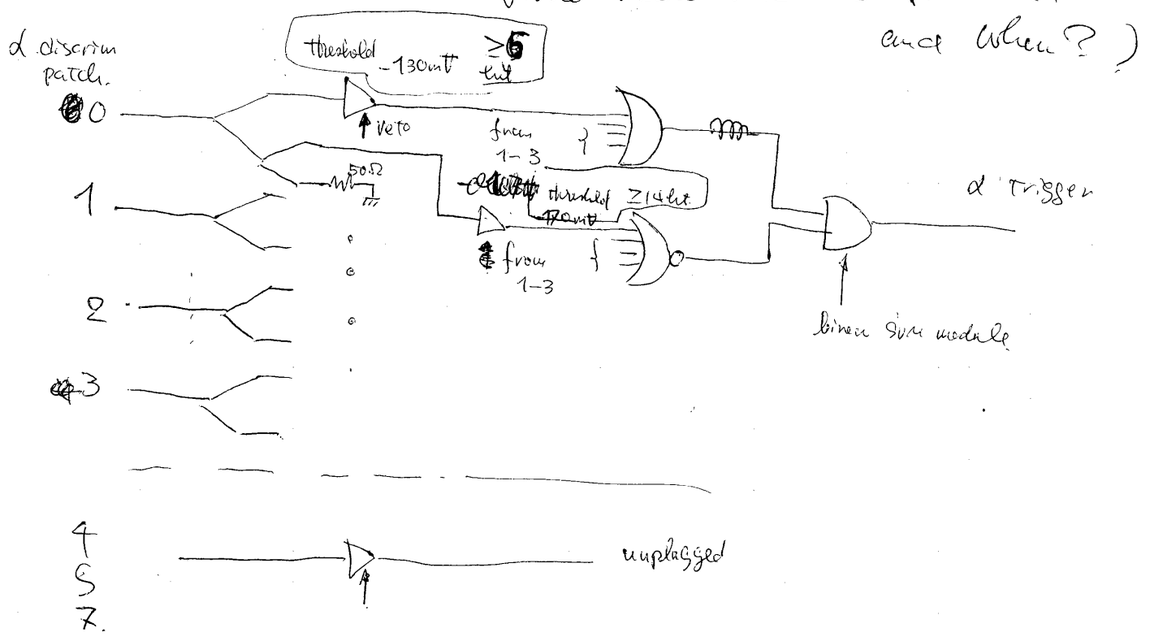
- This fine structure(*) can be seen even before MACRO
- FANOUT between Xe and LYSO
- Maybe due to reflection in the cable from the detector or neutron ?

7(Oct)04

20:00 Found there was a software sleep in the frontend code (50 msec sleep after α events)
This was removed and front end recompiled.

920

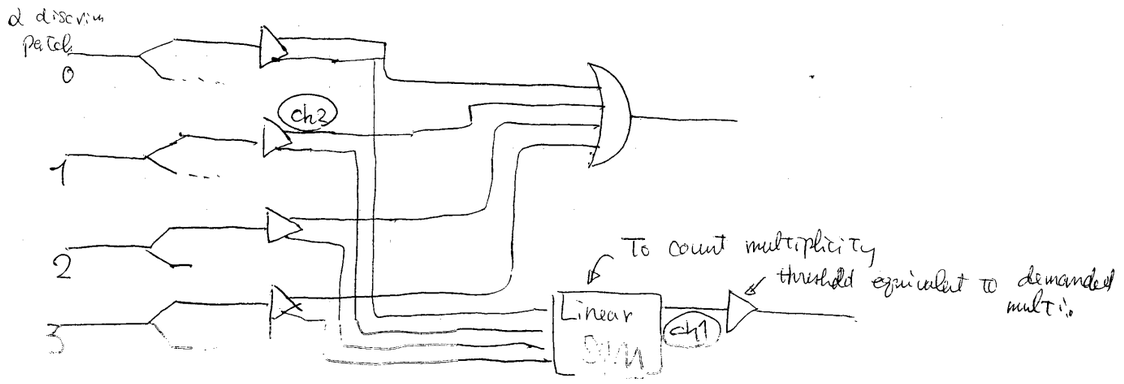
Current α trigger scheme.
(Who made this modification? and when?)

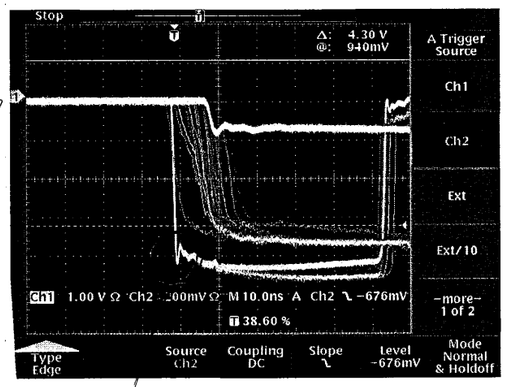


↑ veto signal is generated by RF signal.

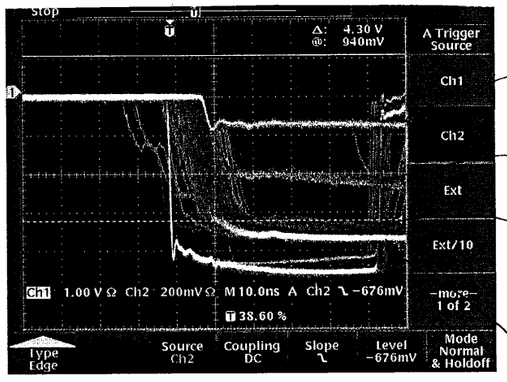
- RF signal Veto is dangerous since that can make easily biased trigger which cannot be analized in offline.
  ⇨ this must be removed.
- It was found that upper threshold, which was introduced to intend to remove gamma events in α RUNS, did not work.
  ⇨ Remove it from current trigger scheme.

TRIAL to veto β events in α-RUN with beam ON





Beam off



Beam on

Patch 1 discrim out as indicated (ch2)

Linear SUM out as indicated (ch1) (saturate at multi = 4 due to linear FAN/in module output)

When Beam is off, almost always only 1 patch fired while when beam is on, almost always all 4 patches fired. Thus, by setting threshold level between 1 patch fired and 2 patches fired, that signal can be used for vetoing β events.

#8053 α run taken with trigger of page 120. ONLY UP/FRONT/LEFT AND Beam on-off.

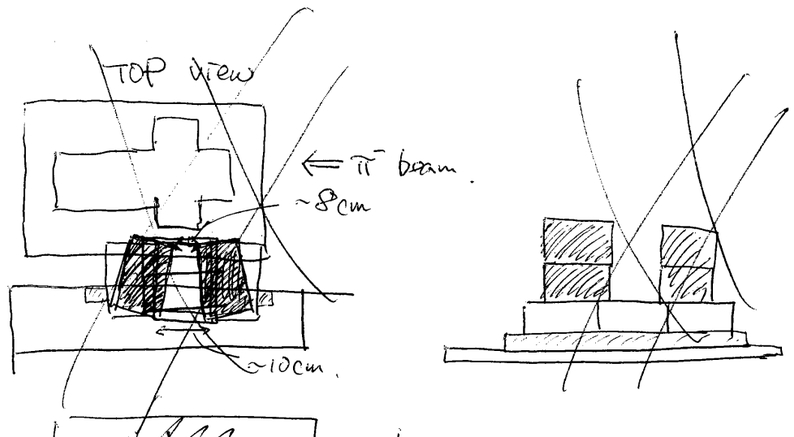
7/Oct/2004

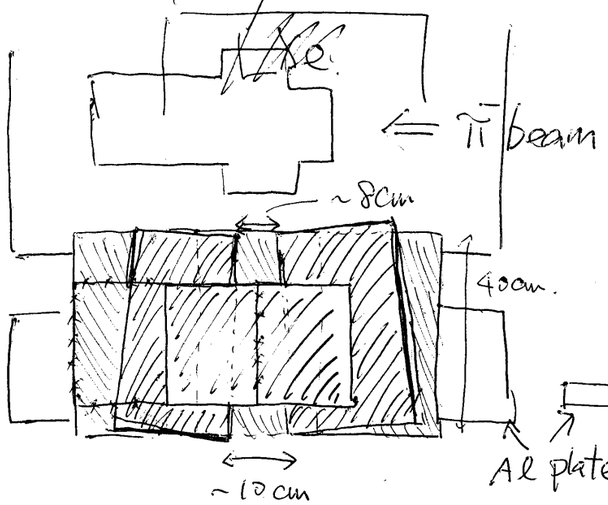
② new scheme for α trigger is introduced. (page 123)

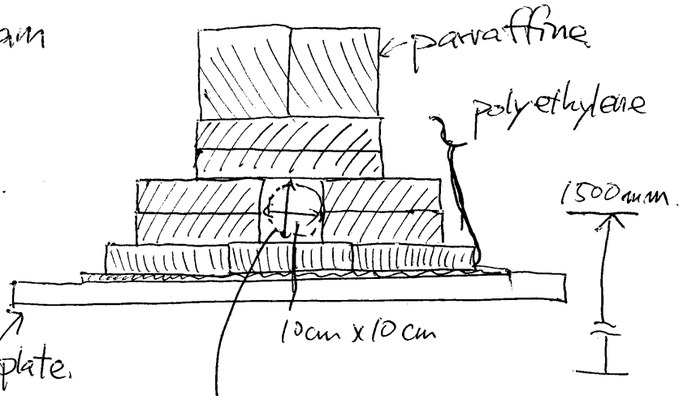
22:38 #8055 pedestal beam off

22:39 #8056 LED

put polyethylene & parraffine ~~blocks~~ blocks between target and LXe.







LXe.

Photograph pasted here

23:30 #8059 Run with the new α-trigger scheme, beam off. 123

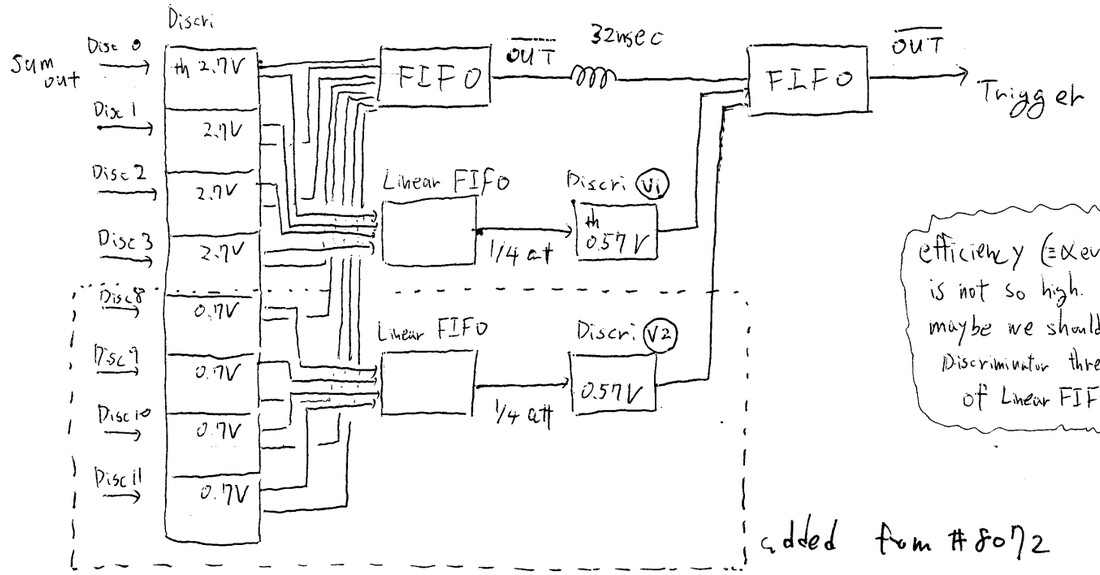
#8060 α beam on 30k events

23:44 #8061 pedestal beam on

#8062 LED "

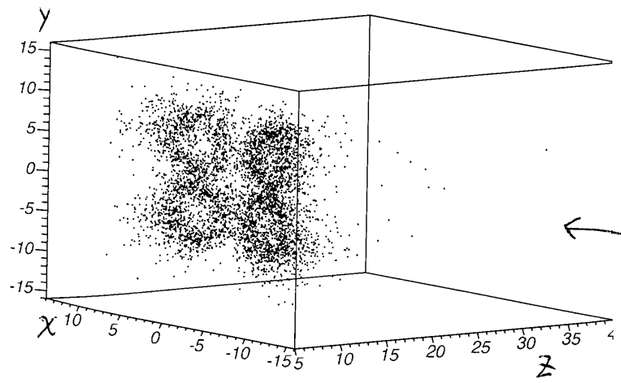
We can see some α sources in run 8060 in the expected proportion. There is another broad peak at around ~9 MeV. Is it real?

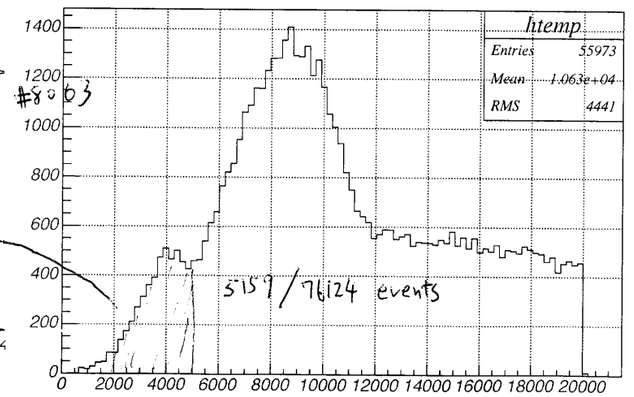
#8063 α beam on high statistics. 70 k events



efficiency (≡ α events/triggered) is not so high.
maybe we should decrease Discriminator threshold of Linear FIFO output

added from #8072





8 - Oct - 2004.

1:18 Run #8064 pedestal beam ON.

Run #8065 LED beam ON

1:29 Run #8066 α beam ON @1852μA.

1:35 beam blocker closed

1:43 Run #8066 stop 100k events

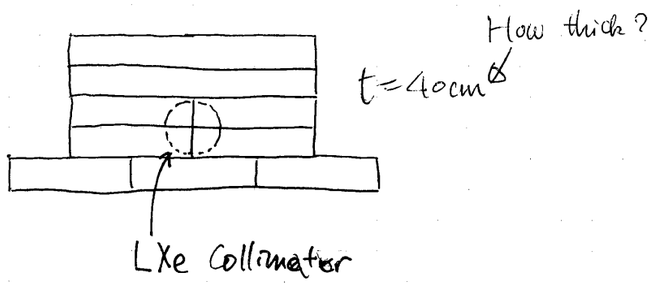
Run #8067 pedestal beam off

~~Run #8068 LED~~

2:40 megaun01 hung up → rebooted.

2:46 Run #8068 pedestal beam off

~~[illegible]~~ re-arranged polyethylene to shut neutrons from LH_2 target.



2:56 Run #8069 ~~pedestal~~ LED beam off.

3:02 Run #8070 α beam off

3:11 Run #8071 α beam off

3:46 beam blocker OPEN

3:24 Run #8071 Stop

added back α trigger

#8072 α beam on ← BB close

#8073 α beam off

6:16 polyethylene put back to ~~arrangement~~ arrangement of pp.125

6:19 #8074 pedestal beam off.

#8075 LED beam off.

6:27 #8076 α beam off

6:30 #8076 Stop.

Beam Blocker OPEN

6:50 #8077 pedestal } beam on.

#8078 LED

#8079 α

7:10 #8080 π^0.

12:03 #8081 π^0

- We check the timing of NaI to take it in the trigger instead of LFSO

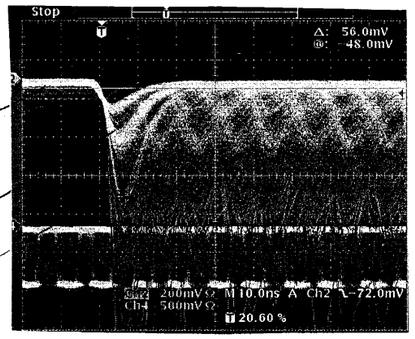
But it is found to be difficult to do that because of late timing and large jitter of NaI even after shortening the cable (64nsec → 32nsec).

8/Oct/04

New S1 counter installed.

- Scintillator size 4 × 5 cm² "6mm"
- PMT XP2020.

This counter has better light collection efficiency resulting in clear seperation of π from electrons in the beam. See the picture below.

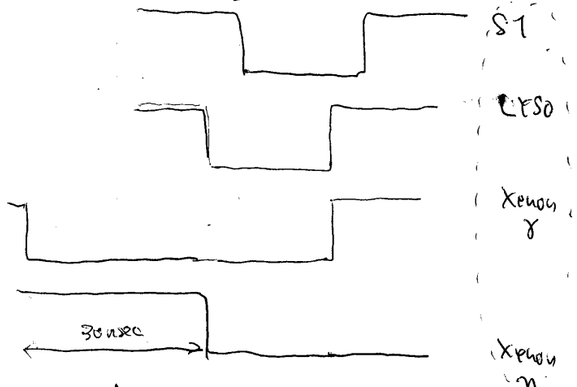


e

π

π - pile up

3-fold Coincidence timing is modified to cover all regions including neutron in xenon.

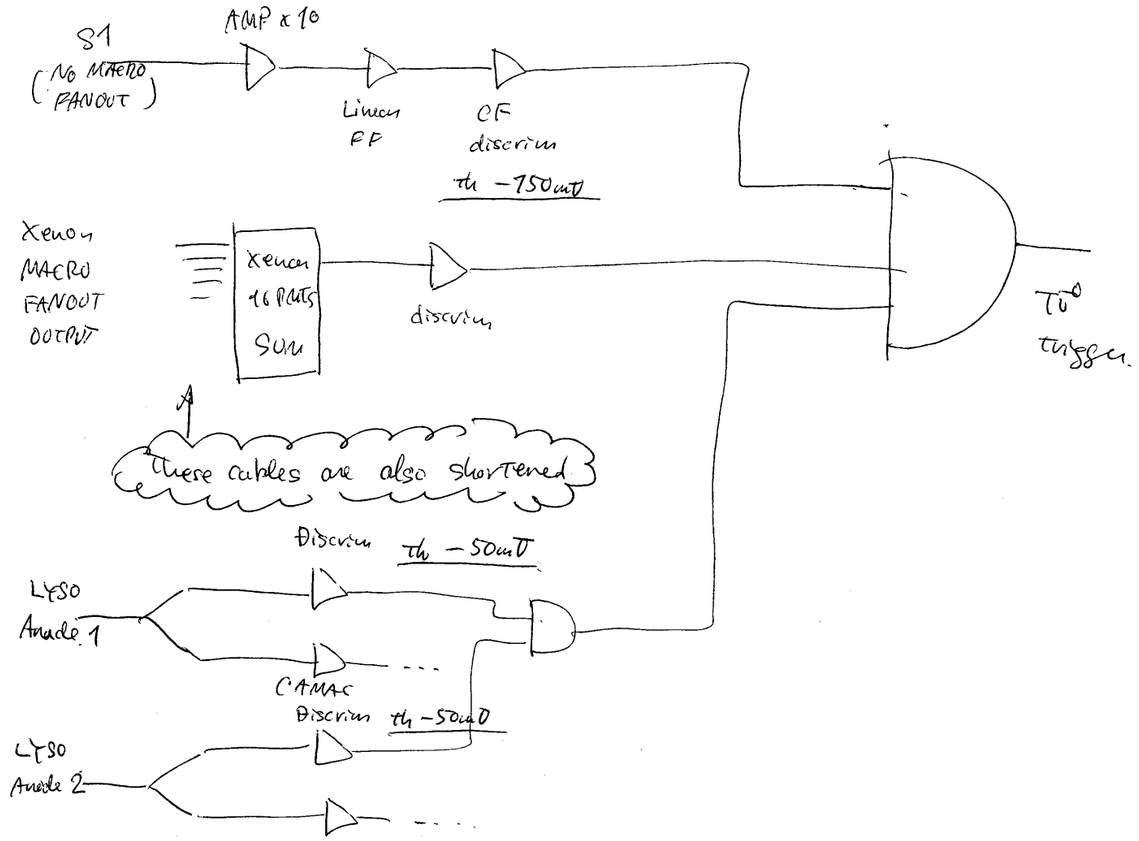


↑ Oscilloscope image triggered with LYSO signal.

- For doing this cables for S1 & LYSO anode signals were shortened from 64 nsec to 32 nsec
- And anode signal from LYSO is used for coincidence instead of Dynode signal.

We were misunderstanding

See p131. SM.



- RF timing is also adjusted to fit this modification.

! Because trigger timing is now earlier by ~30nsec, we added 32nsec delay in the start signal of FB-TDC's and CAMAC-ECL input TDCs.