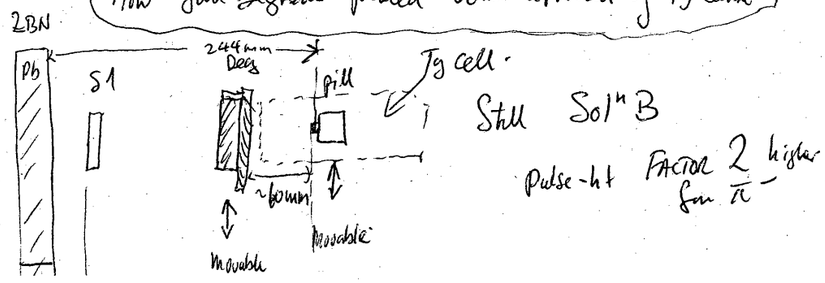
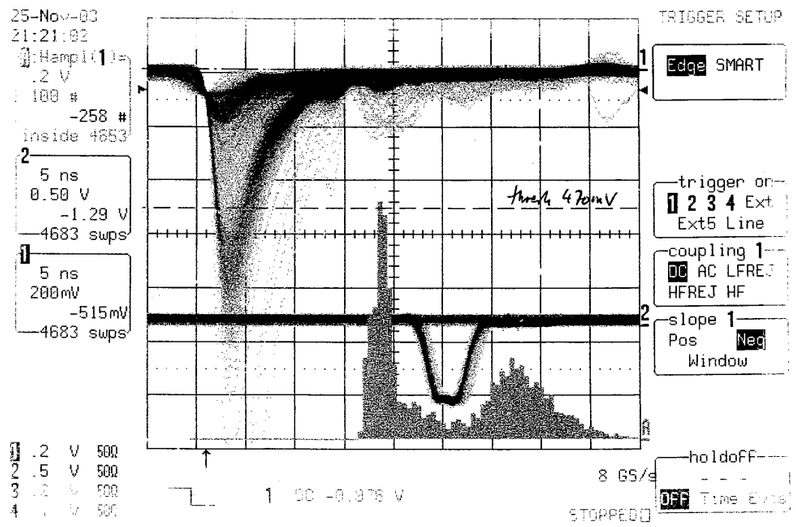
25/11/2003

Continuation of Beam Tuning in Preparation for Placing Degrader Inside Vacuum Chamber

IMPORTANT FINAL Soln

Now full Degrader placed 6mm upstream of Tg Centre





IMPORTANT : Final Sol^{n} B with Deg in Vacuum

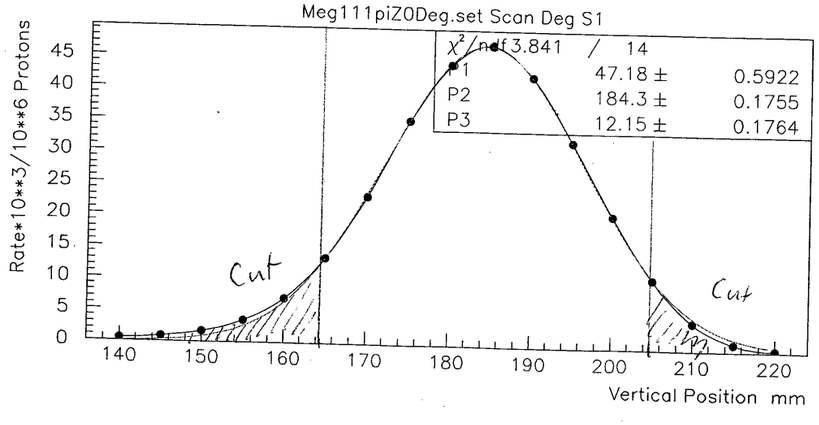
New Vertical Scan · for H = 154.7 mm (Full Degrader = Entrance Tg Cell) (55)

Sol^{n} B.

Vertical position	Pill·RF/10^6 p
185.0	47.23 k
190.0	42.38 k
195.0	32.18 k
200.0	20.73 k
205.0	10.88 k
210.0	4.30 k
215.0	1.15 k
220.0	0.26 k
180.0	44.08 k
175.0	35.18 k
170.0	23.16 k
165.0	13.36 k
160.0	6.97 k
155.0	3.43 k
150.0	1.65 k
145.0	0.82 k
140.0	0.44 k

17 pts

$\bar{X}$ = 184.3
σ = 12.15 mm
Σ = 288.20 k/10^6 p·



Important : Final Sol^{n} B with Deg in Vacuum

(56)

New Horizontal Scan with V: 184.3 mm · Sol^{n} B S1 + full degrader ≡ inserted Tg cell.

Horizontal position	Pill·RF/10^6 p
155.0	47.42 k
160.0	40.75 k
165.0	29.27 k
170.0	16.64 k
175.0	8.23 k
180.0	3.19 k
185.0	1.23 k
190.0	0.49 k
195.0	0.21 k
150.0	45.90 k
145.0	37.82 k
140.0	26.20 k
135.0	15.37 k
130.0	7.66 k
125.0	3.37 k
120.0	1.37 k
115.0	0.53 k
110.0	0.32 k

18 pts

$\bar{X}$ = 153.0 mm
σ = 11.87 mm
Σ = 285.97 k/10^6 p

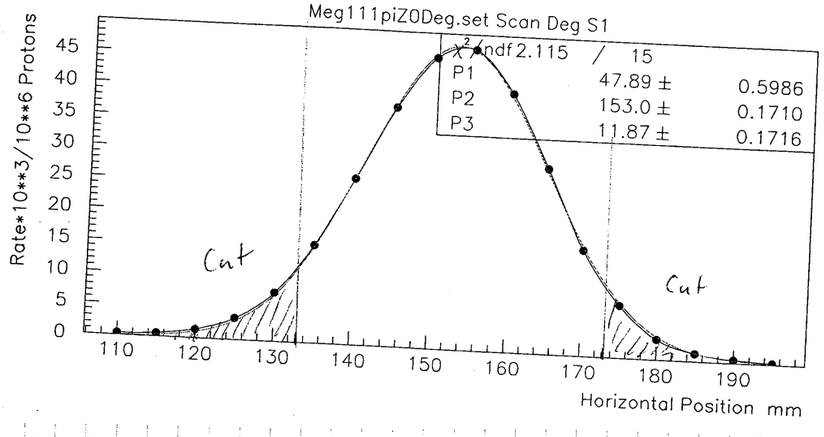
Rate @ Optimum V: 184.3
H: 153.0
$S1_\pi$ = 48.41 k/10^6 p
$S1_\pi \cdot RF$ = 47.67 k/10^6 p·

Rate Estimate : Gaussian $R_\pi = \frac{2\sigma_x\sigma_y R_{pul}}{v_{p.\pi}} = \frac{2 \times 12.15 \times 11.87 \times 47.67 \text{ k}/10^6}{1^2}$

R_π = 1.38·10^7/10^6 p·

Sol^{n} B. degrader IN Tg

$R_\pi = 1.38 \cdot 10^6\ \pi^- \cdot RF/\text{mA s}$.



Low Rate Version of Sol^{4}B with Deg in Vacuum

FSH52 = 125

New Repeat Scan Sol^{4}B with Full Degrader + S1 but FS52 = 125 Low Rate

Vertical Scan	H = 153.0	pi11.RF/10^6p
185.0	17.55 k	
190.0	15.85 k	
195.0	11.87 k	
200.0	7.88 k	
205.0	4.134	
210.0	1.55 k	
215.0	0.37 k	
220.0	0.08 k	
180.0	16.45 k	
175.0	13.31 k	
170.0	9.07 k	
165.0	5.27 k	
160.0	2.73 k	
155.0	1.29 k	
150.0	0.58 k	
145.0	0.27 k	

(16 pts)

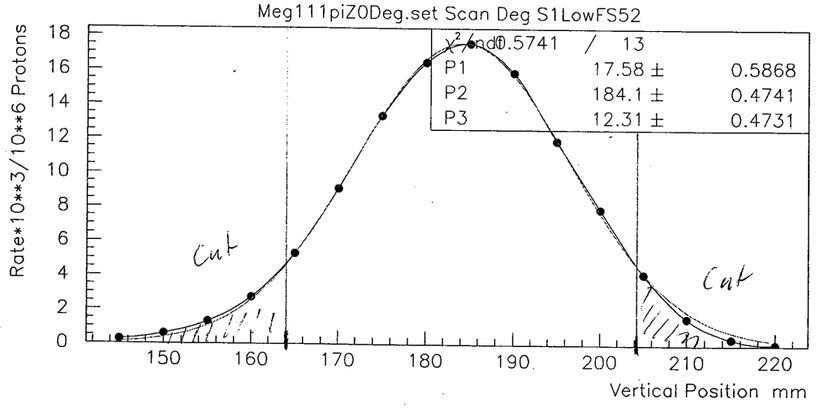
Vert
$\bar{x}$ = 184.1
σ = 12.31
Σ = 108.25 k/10^6p

Hor
$\bar{x}$ = 153.2
σ = 11.95
Σ = 105.92 k/10^6p

Horizontal position	pi11.RF/10^6p
155.0	17.53 k
160.0	15.22 k
165.0	11.66 k
170.0	6.32 k
175.0	3.14 k
180.0	1.25 k
185.0	0.51 k
190.0	0.19 k
150.0	16.95 k
145.0	13.66 k
140.0	9.65 k
135.0	5.77 k
130.0	2.85 k
125.0	1.17 k
120.0	0.50 k
115.0	0.21 k

(16 pts)

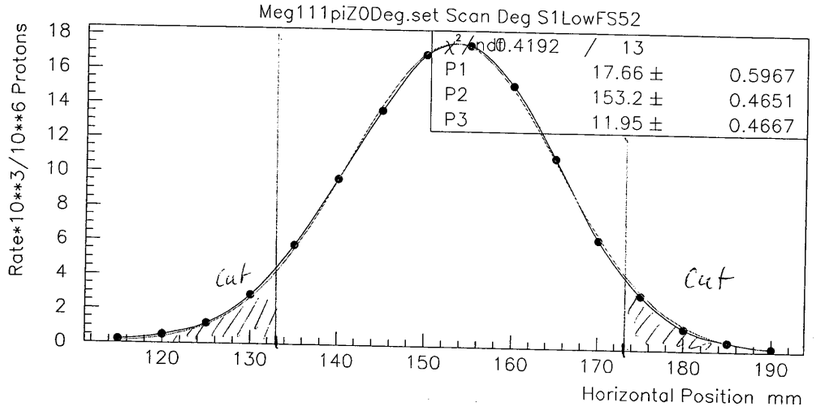
Rate Measurements @ optimum
$S1_\pi$ = 17.76 k/10^6p
$S1_\pi \cdot RF$ = 17.64 k/10^6p
5.52 sec



Low Rate Version of Sol^{4}B with Deg in Vacuum

FSH52 = 125

Low Rate FS52 = 125 continued



Rate Estimate Gaussian $R_{\bar{\pi}} = \frac{2\sigma_x\sigma_y R_{pi11}}{\nu_{p,11}^2} = \frac{2 \times 11.95 \times 12.31 \times 17.64\,k/10^6p}{12}$

$R_{\bar{\pi}} = 5.2 \cdot 10^6/10^6 p$

FS52 = 125 $R_{\bar{\pi}} = 5.2 \cdot 10^5\ \bar{\pi} \cdot RF/mA$

FACTOR 2.6x less than FS52 = 350

Test of Soln A with Deg in Vacuum

Now Test of Soln A Meg 111 piS1g. Set.
Full deg @ Tg Coil FS52 = 350

Vertical Scan H: 153.2

Position	p.11. RF/10^6p
185.0	28.29 k
190.0	26.81 k
195.0	23.58 k
200.0	18.01 k
205.0	12.68 k
210.0	7.64 k
215.0	3.45 k
220.0	1.40 k
225.0	0.40 k
230.0	0.14 k

21 p5

$\bar{x}$ = 184.3
σ = 15.94
Σ = 227.15 k/10^6p

Position	p.11. RF/10^6p
180.0	27.00 k
175.0	23.99 k
170.0	19.40 k
165.0	13.54 k
160.0	9.41 k
155.0	5.34 k
150.0	3.07 k
145.0	1.60 k
140.0	0.80 k
135.0	0.41 k
130.0	0.19 k

Horizontal Scan V: 184.3

Horizontal position	p.11. RF/10^6p.
155.0	27.81 k
160.0	24.53 k
165.0	17.77 k
170.0	10.83 k
175.0	5.61 k
180.0	2.36 k
185.0	0.95 k
190.0	0.37 k

$\bar{x}$ = 153.2
σ = 12.26
Σ = 173.59

Horizontal	p.11. RF/10^6p
150.0	27.11 k
145.0	22.33 k
140.0	15.70 k
135.0	9.52 k
130.0	4.80 k
125.0	2.26 k
120.0	1.02 k
115.0	0.41 k
110.0	0.21 k

17 p4

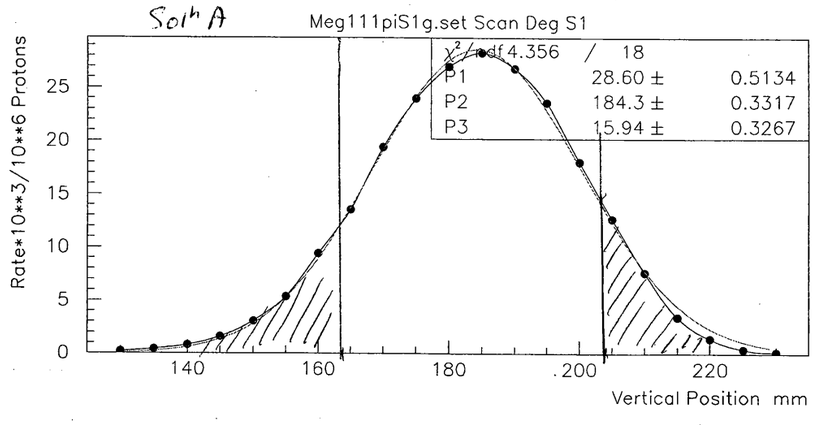
Rate @ Optimum $S1_\pi$ = 28.41 k/10^6p
$S1_\pi$ · RF = 28.03 k/10^6p
5.525 secs 1840 μA

Rate Calculation Gaussian.

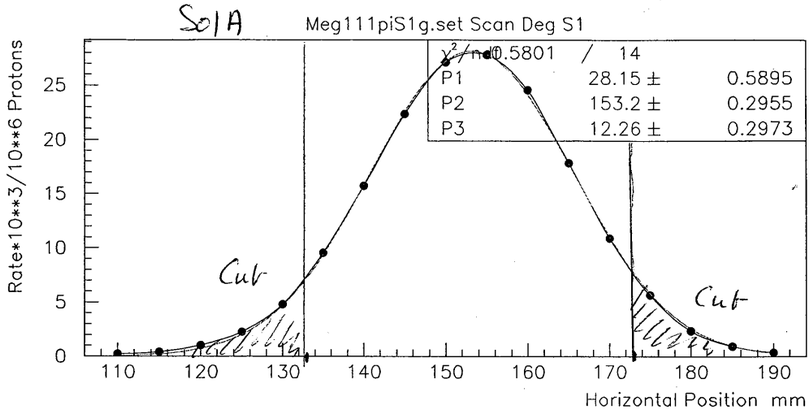
Soln A Deg @ Tg $R_\pi = \frac{2\sigma_x\sigma_y R_{p.11}}{r_{p.11}^2} = \frac{2 \times 12.26 \times 15.94 \times 28.41 k/10^6 p}{T^2}$

$R_\pi = 1.1 \cdot 10^7 \bar{\pi} \cdot RF/10^6 p$

Soln A $R_{\bar{\pi}} = 1.1 \cdot 10^6 \bar{\pi} \cdot RF / m\,AS$



Soln A Horizontal Scan Continued:



Conclusions

(A) Soln B better than Soln A from (i) Absolute Rate in S1
(ii) Tg acceptance.

Soln B = $1.38 \cdot 10^6$ $\bar{\pi}$·RF/μAS
Soln A = $1.1 \cdot 10^6$ $\bar{\pi}$·RF/μAS

(B) Both Rates Somewhat Lower than optimization ~ 17%
So Could be due to ZBN Collimator being Closed more
+ focusing on Tg $\bar{E}$

(C) We gain appreciably in Tg Acceptance & Rate if
We Place Degrader INSIDE Vacuum Chamber &
Use Soln B
Meg III piZO Deg. Set

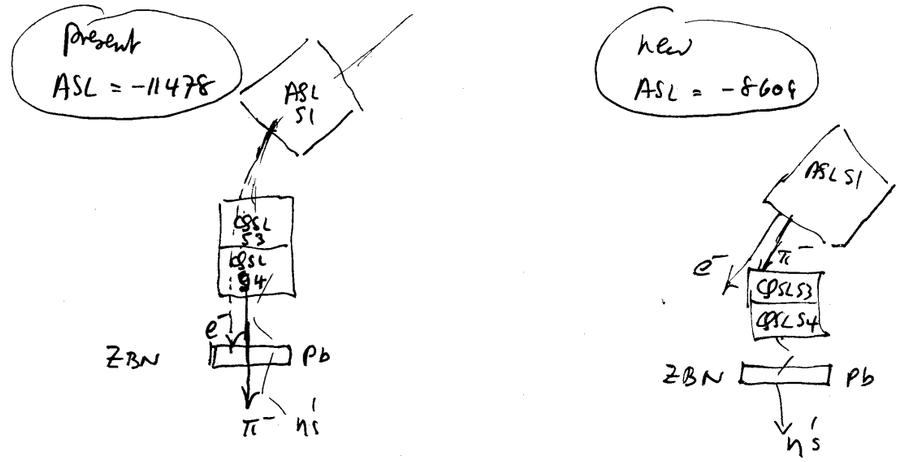
(D) Confirm that closing FSH52 only changes Rate Not Profile
i.e Not a dispersive focus !!! (Good)

Suggest:

(i) Set Soln B Meg III piZO Deg. Set
Move Scanner table out of beam Replace Degrader
@ Old location

(a) take data with NO Tg.

(b) Change ASL 51 present value −11478
to Say −8609 i.e 25% lower
take data.



If background in Calo due to neutrons from beam like
Changing ASL will Not Change n-background.
if background from Scattered beam e⁻ @ Pb or bremsstrahlung
Changing ASL Will Change background !!!

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~0:40 **BB open.** FSH 52 = 350"

S1 Set to -1900V Degrader replaced to original position

Pill removed from beam

- electronics should to restored to previous situation before beam optimization Rates checked ok

1:34 RUN #6761 pedestal, BB open. w/o TARGET.

SCFE tripped → restarted. ↳ JUNK RUN

1:36 RUN #6762 pedestal, BB open. w/o TGT.

1:38 RUN #6763 LED : :

1:44 RUN #6764 alpha BB open. w/o TARGET

proton 1837 μA

NIM Threshold changed from -75 mV to -40 mV

2:10 RUN #6765 alpha. BB open. w/o TGT, NIM thre -40 mV.

2:20 RUN #6766 Xe 8 cluster trigger

trigger rate	25.2 kHz
proton	1838 μA
S1	16.9 M/10^6p

2:36 **BB closed**

Removed S1 counter and degradors from the Beam line. S1 HV turned off (was: 1900V)

2:50 **BB open**

3:23 RUN 6767 pedestal. BB open, NO TGT, NO S1.

3:25 RUN 6768 LED : : :

~~found~~ SCFE was found to be dead. → restarted.

6767 & 6768 ⇒ JUNK.

3:28 RUN # 6769 pedestal. BB open, NO TGT, NO S1, NIM thre -45 mV

3:29 RUN # 6770 LED : : : :

3:34 RUN # 6771 alpha : : : :

proton 1839 μA.

3:48 RUN # 6772 Xe 8 cluster BBopen. NO TGT, NO S1, NIM thre -40 mV.

trigger rate	26.9 kHz
proton	1839 μA.

4:00 **Change ASL51 from -11478 To -8609**

4:30 RUN #6773 pedestal BB open. No {TGT, S1}, ASL51: -8609

NIM thre -40 mV.

4:31 RUN # 6774 LED : : :

4:37 RUN # 6775 alpha : : :

proton 1840 μA

4:52 RUN # 6776 Xe 8 cluster

trigger rate 8.6 kHz.

proton 1837 μA

7:00 Beam Stopped. Maintenance Till 4:00 PM : MV 2

(2-day maintenance : RING

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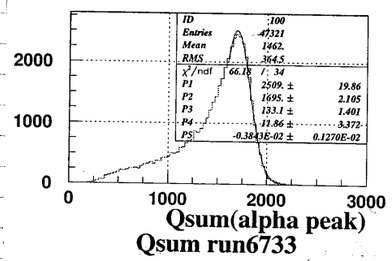
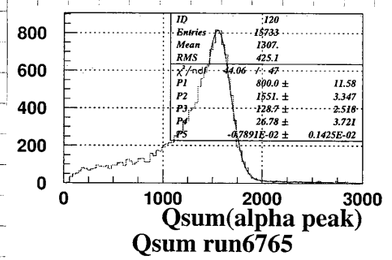
7:19 Refrigerator Status

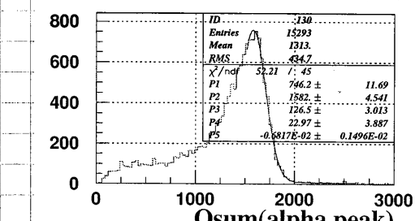
Temp 169.98 K

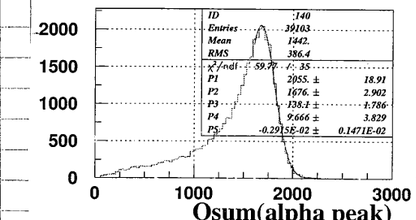
Heater POWER 39.84%





- BB closed
  - Target in Position
  - ~~Hydrogen Gas~~ Water
  - Empty target
- BB opened
  - No target chamber





- BB opened
  - No target chamber
  - No degraders
  - S4 removed
- BB opened
  - ASL 51 25% reduction of current

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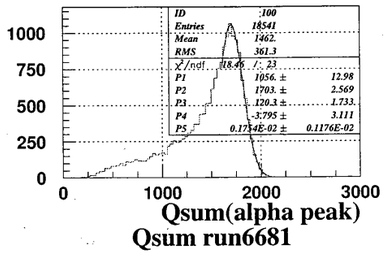
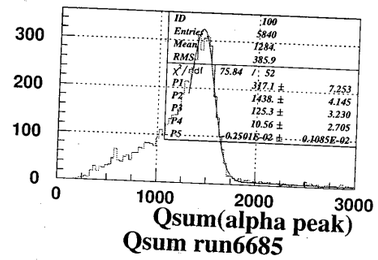
Proton ~1900nA. PSH52 = 350

~~Hydrogen Gas~~ Empty Target

BB ~~opened~~ closed. (chamber in position)



BB opened



SUMMARY (S4, IT, SM)

Beam line Effect (RUN 6733 - RUN 6771) : 6.7%

1.8% [Beam line ⊕ (S4 degrader) (RUN 6733 - RUN 6765) : 8.5%

6.5% [Beam line ⊕ (S4 degrader) ⊕ Target Chamber (RUN 6733 - RUN 6685) : 15%

1: Beam line effect contributes by 6.7% reduction of α peak position. This is not due to "neutrons" from upperstream of ASL51 but due to "particles" produced after ASL 51. because peak position was restored when ASL51 current was reduced

2. S4 & degrader could be a source of background. Their contribution is estimated to be 4.8%.

3. Target Chamber also could be a source of background Their contribution is estimated to be 6.5%

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To-do list in this 2-days shutdown

- Target
  - X - degrader support in the chamber (Wed)
  - alignment (Thu) — morning
  - filling (Thu) — afternoon

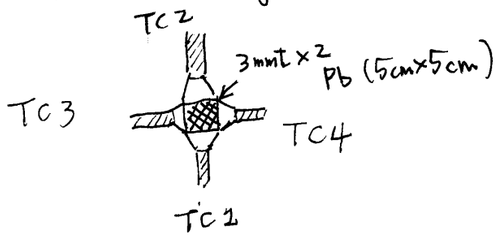
- X PMT
  - new HV setting for higher gain (2×10^6 (1×10^6 but with higher gain for low QE PMTs))

- X TDC
  - Installation of another VME TDC.
    Test (Wed)
    Installation (Thu)
    - base address setting
    - on-line code

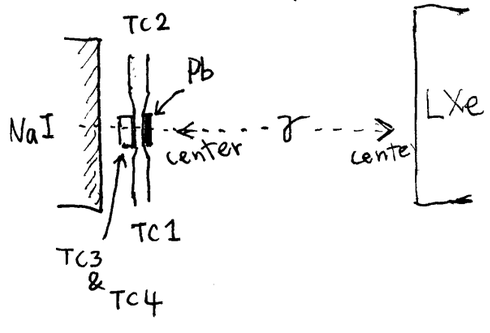
- AMPLIFIER/SPLITTER. Test

- Timing counter set up

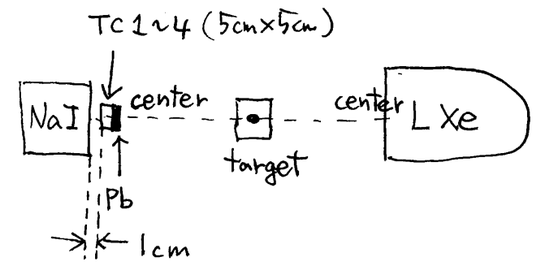
<view from target>



<view from side>



<view from the top>



12:06 RUN# 6777 COSMIC ~2.0 Hz

13:03 stop 6777

Start making new HV settings

13:05 # 6778 pedestal

changed LED_N_EVENTS 1000 (from 5000) temporary
in ledrun.h

(compile analyzer
compile frontend

13:11 #6779 LED (events for each steps is still 5000) why ?

clean & build frontend

13:18 #6780 LED (LED_N_EVENTS = 1000)
O.K. now events of each steps is 1000.
Window of HV Edit is invisible. ⇒ fixed
save current HV setting as run06780.hv
make next hv data of "QE normalized le6"
on offline computer

14:20 load next 6780.hv

14:20 #6781 LED same as 6780 (failure) logger didn't work.

14:25 #6782 LED same as 6780

load next6782.hv

14:33 #6783 LED same as 6780

14:43 load next 6783.hv (difference of voltage between next6783.hv and next6784.hv is less than 4V

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change LED_N_EVENTS 5000

14:48 #6784 LED (LED_N_EVENTS = 5000)

O.K. difference between next6783.hv and nex6784.hv is less than 3V.

converged.

Save as "le6_qe_031126.hv"

load next6784_3e6.hv for 3×10^6 gain (not taking in to account Q.E.)

15:30 #6785 LED

15:41 load next 6785.hv

15:43 #6786 LED

15:58 load next6786.hv

15:58 #6787 LED gain seems converged. at 3e6.

change LED_N_EVENTS to 5000

load next6787.hv

16:16 #6788 LED

#6789 LED

load next6789.hv (gain converged to 3e6)

Save as "3e6_031126.hv"

17:56 HV adjustment to 3×10^6 with QE.

18:04 next 6789_qe.hv loaded.

18:08 #6790 LED w/ next 6789_qe.hv

#6791 pedestal "

18:32 next 6790_qe.hv loaded

18:35 #6792 pedestal

#6793 LED

Difference converged within 3V ⇒ saved as

18:51 #6794 pedestal 3e6-qe-031126.hv

#6795 LED (5000 evts per each step)

HV adjustment to 5×10^6 w/o QE correction

- LED intensity setting changed ~~to {87, 89, 91, 93, 96, 98}~~ from {91, 92, 94, 96, 98, 100} to {90, 92, 94, 96, 98, 99}

in frontend.c

19:30 next 6795.hv loaded

#6796 pedestal

19:52 #6797 LED (1000 evts/step)

20:08 next 6797.hv loaded

#6798 pedestal

20:10 #6799 LED (1000 evts/step)

⇒ 1000 evts is not enough to estimate gain accurately

⇒ ~~1000 evts~~ changed to 3000 evts/step

20:20 #6800 LED (3000 evts/step)

⇒ it looks converged. ⇒ next 6797.hv is saved as 5e6_031126.hv

21:32 #6801 LED (5000 evts/step)

#6802 pedestal

HV adjustment to 5×10^6 w/ QE correction

22:11 next 6801.hv loaded

22:15 #6803 pedestal

22:16 #6804 LED (5000 evts/step)

22:47 # next 6804 loaded

22:52 # 6805 pedestal

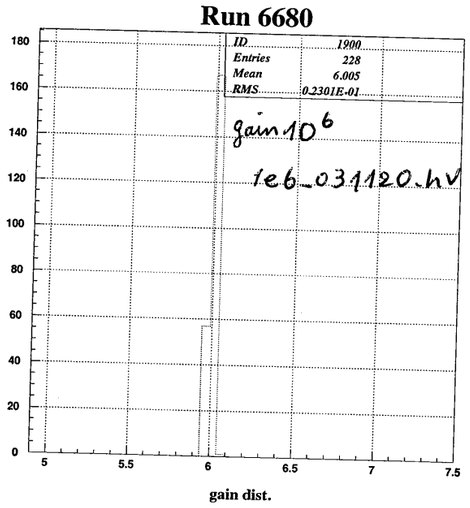
#6806 LED ⇒ converged

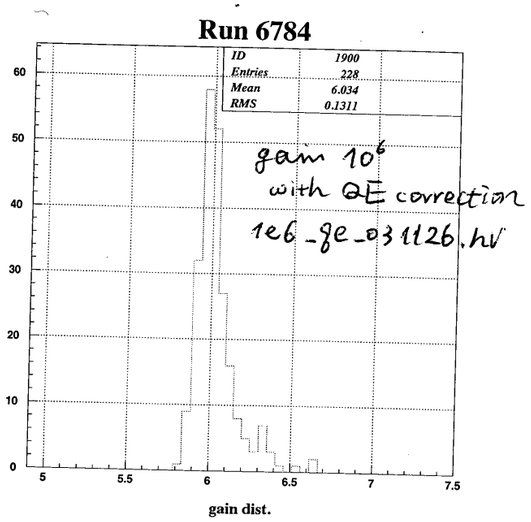
23:25 next 6806.hv loaded next 6806.hv is saved as 5e6_qe_031126.hv

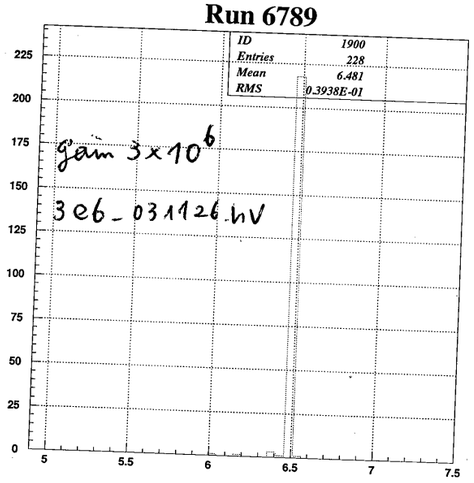
23:27 # 6807 pedestal

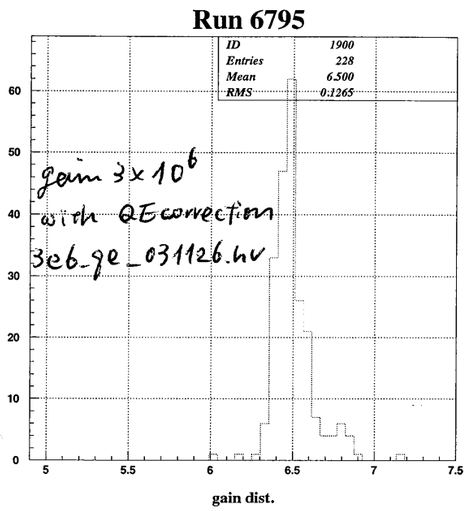
23:27 # 6808 LED

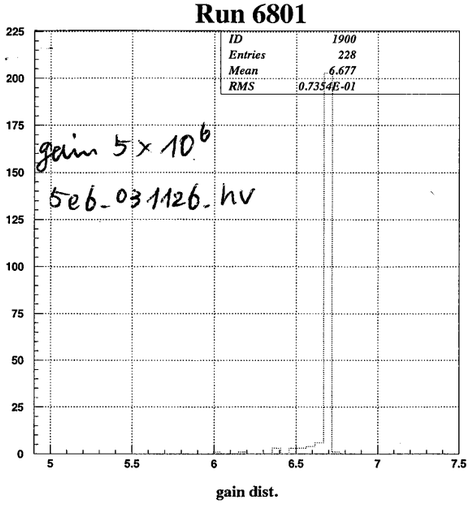
Summary of gain setting.

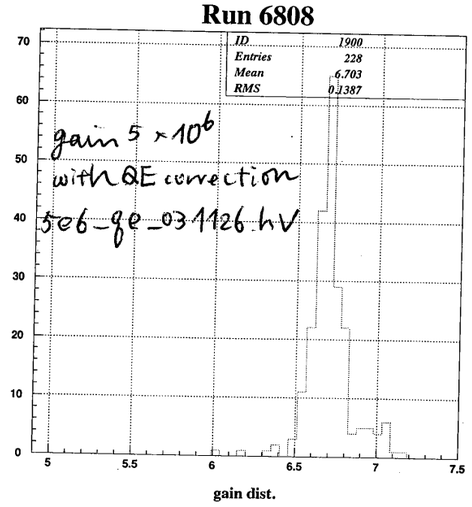




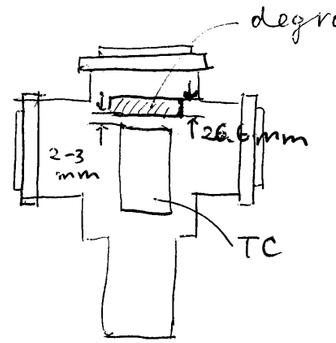








* Degrader is placed just in front of the target cell inside the chamber (done by P.-R.)



* ~ 17:00 on Nov. 24 Evacuation started.

24:20 * Hv setting file 1e6_031120.hv loaded (10^6)

* LED intensity setting changed back to 191.92.94.96.98.100 in frontend_C

* NIM threshold changed from −40 mV to −25 mV.

* ASL57 changed from −8609 to −11478.

27/Nov/03

7:10

Refrigerator status.

Cold head Temp. 170.04 K

heater power 37.42%

Target status

insulation vacuum 3.4×10^{-5} mb

Ready to cool and fill.

· 27/Nov/2003

0:58 RUN #6809 pedestal w/o beam.

1:00 RUN #6810 LED

1:06 RUN #6811 alpha

1:14 RUN #6812 cosmic ray

trigger rate ~ 2Hz.

5:15 RUN #6813 cosmic ray.

10:00 ~ 12:30 S1 & Target alignment done...

14:10. Pre-cooling of the target started

14:26 RUN #6814 Cosmic Ray

18:15 SCFE not running. Restarted

20:48 RUN #6815 Cosmic Ray

LH_2 target filled

22:05 end Run #6815

22:06 RUN #6816 pedestal

22:07 RUN #6817 LED

22:13 RUN #6818 alpha

23:40 BB open

28/NOV/2003

01:00 Still no beam.

05:30 Beam tuning during the whole night, with beam-on / beam-off cycles shorter than 10 min.

7:31 BT29 HV error. 1458 (Rev01) Logical Unit 8 channel 9

Impossible to apply target voltage 1189V

Switch off and wait for a while...

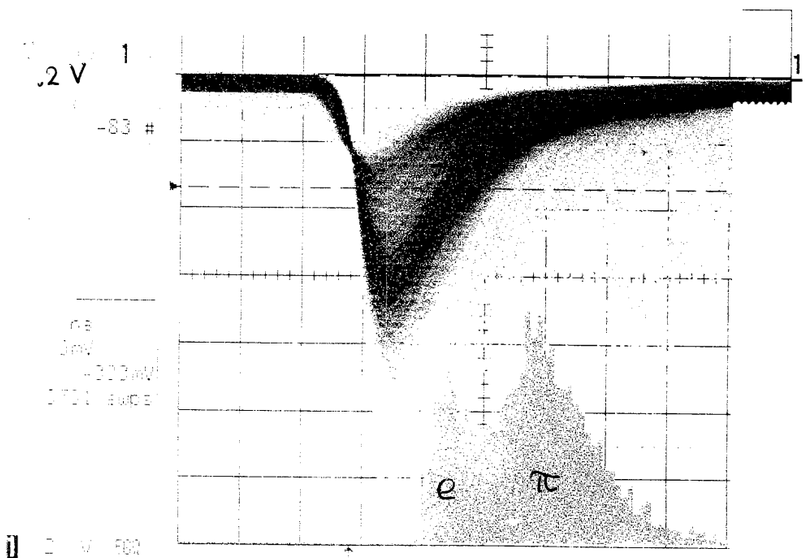
7:36 STOP PUMP RUN, #6820.

7:38 Refrigerator status

Cold head Temp. 170.0K

heating Power 41.52%

9:09 Beam is rather unstable still...



- S1 signal after changing the degrader position
- Pulse height seperation between electrons & πs as worse than previous

S1 threshold (CF) changed from -485mV to -327

28/Nov/03

10:33 beam looks to be stabilized

RUN 6821 π^0 trigger (of course)

take π^0 data to check all things

This RUN was started immediately after beam was back.

TRIGGER Request 15.8 Hz !!!! proton current

1.762 mA

FSH52 = 350.

2.5 MHz π^- from visual scaler. (S1 rate 1.3 MHz from CAMAC scaler ?)

1×10^6 gain setting

10:59 Beam is stable now. take calibration data

RUN 6822 pedestal FSH52 350
proton 1.792 mA

RUN 6823 LED +SH52 350
proton 1.805

In these RUN, F23 signal was not in to study the amplifier (also S1 for beam line study)

Take calibration data again

11:25 RUN 6824 pedestal FSH52 350
proton 1.798

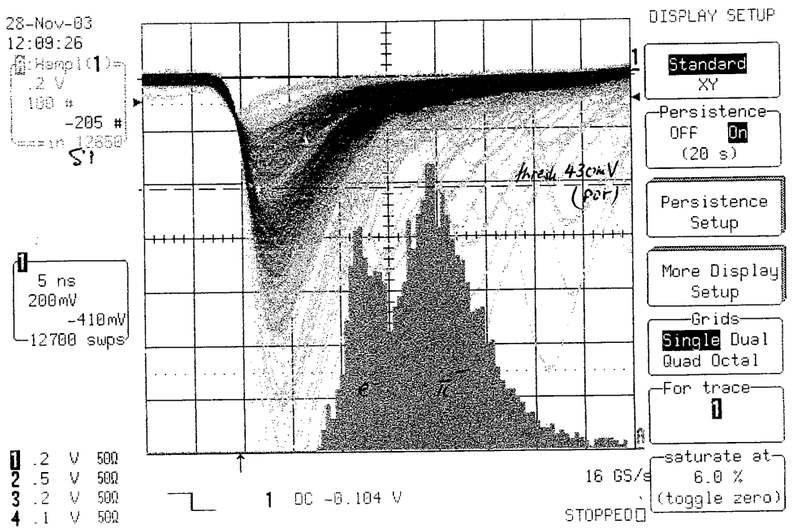
RUN 6825 LED "

RUN 6826

11:44 alpher "

Final Beam Measurements

Measurement with S1 Degrader INSIDE Tg 28/11/2003 (61)



S1 HV = -1900V
DS1 timer = 430 par.

Beam electronics.

Meg III pi20 deg
FS52 = 350

$S1_\pi$ = 19.785 M/10^6p
$S1_\pi$·RF = 15.266 M/10^6p.
$S1_\pi$·RF·γ = 14630 /10^6p.
in 5.679 Secs 1790 μA

$S1_\pi$ = 19.861 M/10^6p
$S1_\pi$·RF = 15.241M/10^6p.
$S1_\pi$·RF·γ(No $\bar{1}$) = 14932/10^6p.
$S1_\pi$·RF·γ·2P = 176/10^6p
in 5.662 Secs 1795 μA

∴ Conclusion

P.11 Scan gave $1.4 \cdot 10^6$ π^-·RF/mA·s ⇒ 2.5 MHz π^-·RF @ 1800μA

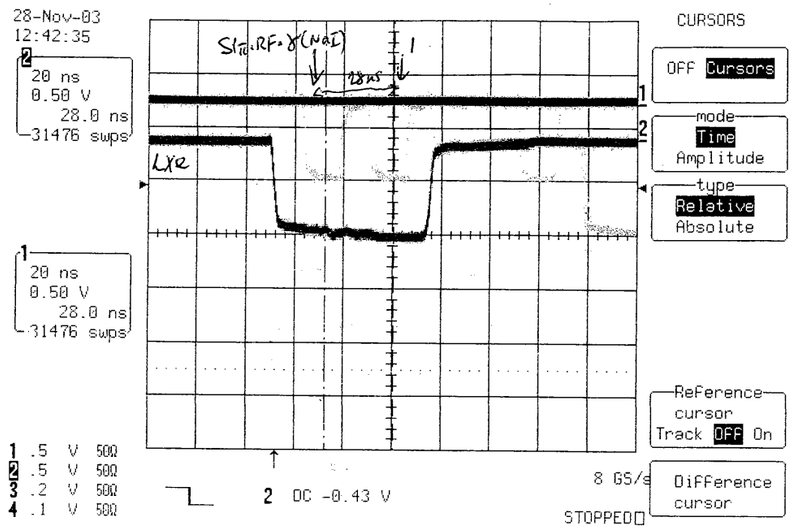
Now S1 measures (above) 2.69 MHz @ 1800μA

Expect ~ 6.4 Hz events / 1 MHz Stopped π^- in Tg.

∴ Expect Trigger Rate ~ 17 Hz

Measured Trigger rate ~ 15 Hz

Beam electronics (62)



above Shows LXe 2P gate with $S1_\pi \cdot RF \cdot \gamma(NaI)$
Which displays 2 signals in gate 28ns apart
≡ TOF of 8.8 MeV γ from $T_g \rightarrow NaI$
this explains (maybe) the Rate of $S1_\pi \cdot RF \cdot \gamma(NaI) \cdot LP$
of 31.1 Hz i.e 176/10⁶p in 5.662 sec.

So Beam Side all Consistent with Expectation.
Rate achied ~ 2.7 MHz Stopped π^-
15 Hz good trigger rate

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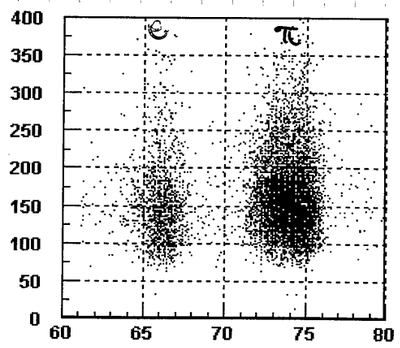
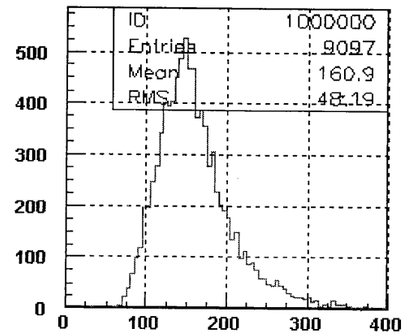
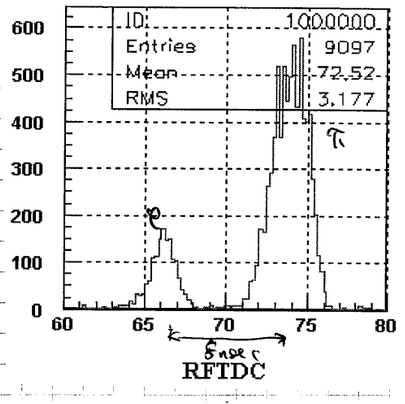
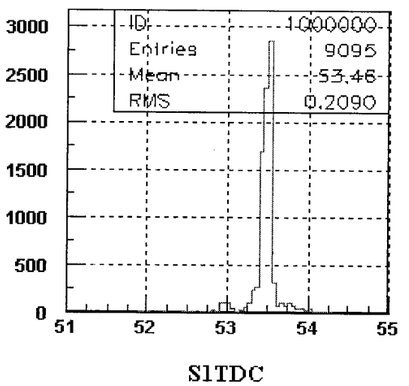




← RUN 6822





12:11 RUN 6822

S1 alone trigger To check new degrader Configuration

See the figure above. Reasonable.

12:41 RUN6828

S1 * NaI * Xe (Front 4 / Back 8) ? ⇒ (Front 8 / Back 4)

FSH52 : 350
proton 4.804μA

~18:20 TDC Set up

CAMAC TDC operation mode is changed from COMMON STOP to COMMON START.
To fit the delay cable, discriminator, TDC combination
Several delay cables added for VME TDC.

28/Nov/2003.

18:28 Pedestal @ 1e6 FSH52 : 350
Run # 6829 proton : 1.819 mA

18:30 Run # 6830 LED

18:37 Run # 6831 alpha

18:47 Run # 6832 Si * Xe (F8 / BK4) * NaI 4. → π^0 trigger

19:49 Run # 6833 Same as #6832 ✓

20:36 SCFE reconnected to LRS1454

20:57 Run # 6834 Same as #6832 ✓

The lamps on the CAMAC TDCs do not always synchronize. Any problem?

21:55 Run # 6836 Same as #6832 ✓

23:11 Run # 6837 Same as #6832 ✓

skip run #?

Things to do.

① alpha with BB closed ⇒ #6848

② ~~low~~ normal intensity (FSH52 : ~~125~~ 350), 5×10^6 gain ⇒ #6849

③ low intensity, (FSH52 : 125). 5×10^6 gain

00:15 Run 6838 Same as #6832 ✓

01:30 Run 6839 Same as #6832 ✓

Beam intensity stable at 1800 in the last 7 hours.

02:45 Run 6840 Same as #6832 ✓

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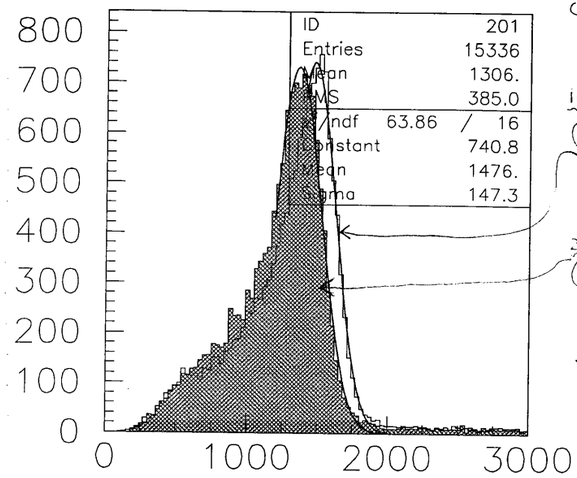


CUT : $-2<x<2$ & $9<y<13$ .or. $-2<x<2$ & $-13<y<-9$ .or. $9<x<13$ & $-2<y<2$ .or. $-13<x<-9$ & $-2<y<2$

16. Nov → Sorry. this α data w/ BB closed !

#6487 w/ BB open calib (ped 6480, LED 6489) FSH 350 α-peak 1476

23. Nov

#6831 w/ BB open calib (ped 6829, LED 6830) FSH 350 α-peak 1362 (7.7% down)

The difference between #6487 and #6831 is the position of degrader.

3:45 Run #6841 Same as #6832. ✓

4:55 Run #6842 Same as #6833 ✓

5:56 Run #6843 pedestal **LED unstable.**

5:59 Run #6844 LED ← **DO NOT USE.**

6:07 Run #6845 α.

Statistical LED calibration data is re-taken as #6850. (⇒ next page)

6:19 BB closed

6:51 Run #6846 pedestal BB closed.

6:52 Run #6847 LED BB closed

7:06 Run #6848 alpha BB closed

7:20 BB open

Refrigerator Status :

T = 170.06 K. / Heater Power : 41.25 %

29/Nov./2003.

09:01. RUN # 6849. pedestal run.) @ Beam ON.
RUN # 6850. LED calibration.)

Suddenly. SCFE down. ⇒ restart, OK. 08:15.

We start the DAQ @ High GAIN mode. GAIN. $1.0\times10^6 \Rightarrow 5.0\times10^6$.

08:30. high gain setting file: Se6_031126.hv loaded.

We have to wait for a moment until gain stabilized.....

HV error occured.

- HV #1-1. (BT9) } enabled via web interface.
  #8-9. (BT29) } ⇒ OK.
  #10-8 (R35).)

09:02. HV error happened again @ BT29, enabled again.

09:10. HV error. Again, Again, ... and again. (It was 1250 V)

⇨ High voltage value of PMT BT29 set to 0 V during high gain run.
(high voltage setting file "Se6_031126.hv" is modified)

09:30. It seems stable....

RUN # 6851. pedestal run @ Se6, Beam ON. (FSH52=350).
RUN # 6852. LED run @ Se6. Beam ON.
RUN # 6853. Alpha run @ Se6, Beam ON.

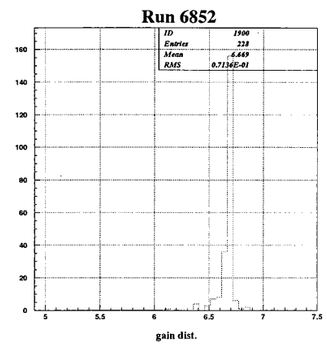
09:57. RUN # 6854 π^0-trigger @ Normal Intensity (FSH52=350)
- Trigger: S1*(NaI 4)*(Ke Fr8/Bk4)
- Proton beam current : 1.827 nA
- Counting rate (after PC veto) : 27 ~ 28 Hz

Smell something burning ....., is it my imagination ??

29/Nov./2003.

10:33 RUN #6854. end. 50000 events taken.
10:33 RUN #6855, π^0 RUN, same as previous run.
11:06. stop the # 6855. - 50000. events taken.
11:09. RUN # 6856, π^0 run. same as before.
11:48. #6856 end.

→ RUN # 6857 ✗ π^0 run same as before.
12:26. # 6857 end.
→ RUN # 6858 ✗ π^0 run. same as before.
13:06. # 6858 end.
→ RUN # 6859 ✗ π^0 run.
13:48 # 6859 end.



≪ Current Gain distribution ≫
$10^{6.669} = 4.667\times10^5$

These run, Lower HV (1458). down!! → RUN # 6854, 5, 6, 7, 8, 9
Now, we took 300 K events in total as "High GAIN", "Normal Intensity".

150 K events in total

≫ Let's change to Low Intensity RUN.

13:59 DAC value for FSH52. : 350 ⇒ 125.

and. Beam Blocker. closed.

~~14:33 RUN # 6860. pedestal @ Se6. Beam Blocker CLOSED.~~
~~RUN # 6861. LED calibration. "~~
~~RUN # 6862. Alpha. run "~~

LRS1458 didn't work in #6852 ~ 6860. I realise this problem just now. I'm so sorry.....
But SCFE said, "Successfully reconnected"!!
Restart the SCFE, but HV supply does not work.
⇒. HV rebooted! → LRS1458 was not turned ON!!

29/Nov./2003.

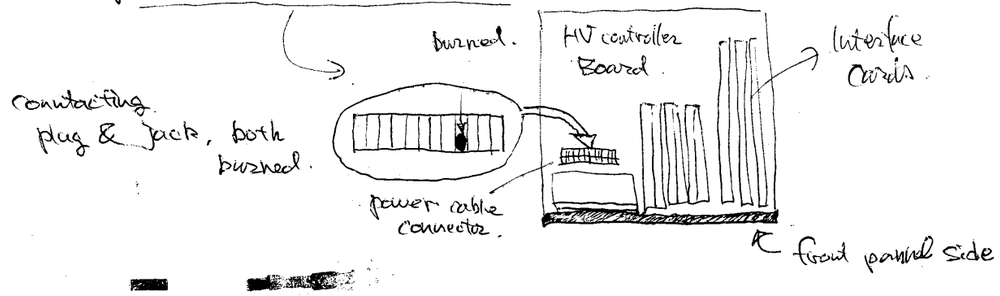
14:43.

- HV power supply LRS1458 is not turned ON.....
- SCFE doesn't say any error message.
- I switched "LOCAL" mode. (from NETWORK mode), then tried to HV turned ON pushing the HV ON button at front panel, but, LRS1458 has no response and NOT turned ON.
- So, let's try to restart all the system for high voltage supply.
- Trying again..... but failure to turn ON HV.
- Then, trying to access via TERATERM,

  HV supply said: "BAD 24V, Thermal overload?"

  So, we wait for a moment & power off.....

  .....
- We tried again.... unfortunately, failed.
- We opened front pannel of LRS1450, and we found that one of power cable seems to burn.



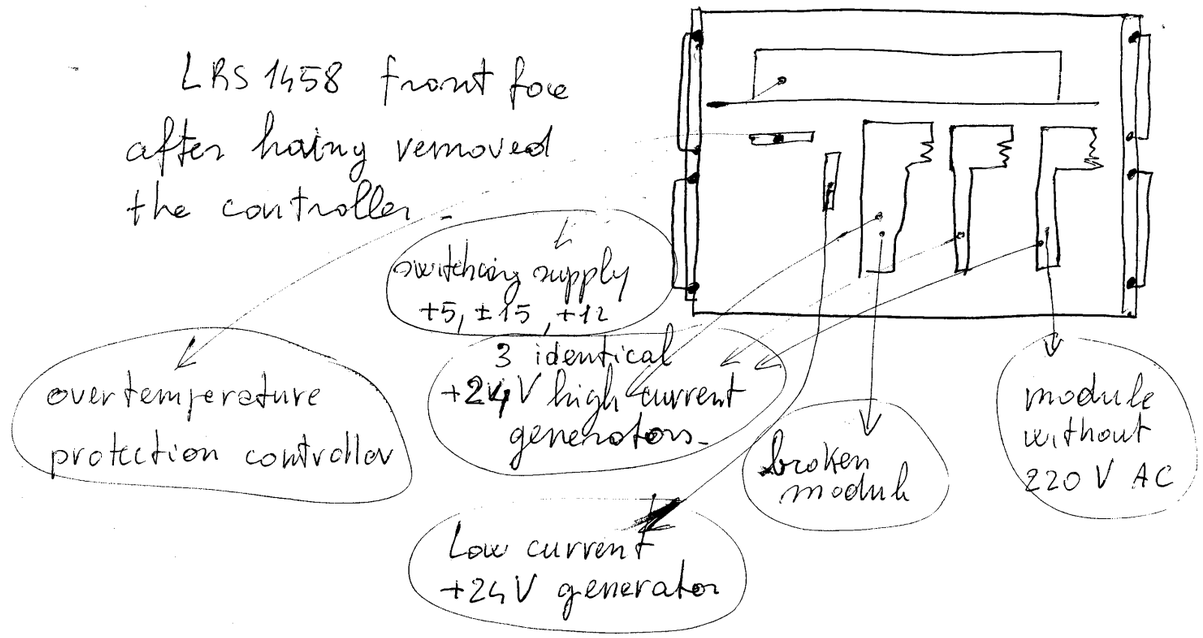
⇒ We repaired this problem, connecting by bipas cable directly. and reboot.... ⇒ failure...

- HV power supply removed from the rack! (Really a painfull job)

21:30 finally we found the problem:
Two high power 5Ω resistors were so hot that burned the printed circuit underneth. A connection of the overtemperature protection layed under the two resistors, and due to the high temperature, it was interrupted — A wire was used to establish again the continuity.

Two questions:
① Why the two resistors were so hot?
② Why one out of 3 power supply of +24V lost the 220V line disconnected?

LRS 1458 front face after having removed the controller.



30/Nov/2003

01:00 unit assembled again, installation in the rack just started.

04:00 HV turned on, but this time we got the red front panel sign, named "HV error", blinking.

04:05 LRS 1458 ch9 of LUN8 → BT29 is something wrong.
So I changed target V to 0V from 1250V.
→ "HV error" signal was turned off.

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07:20. DISK FULL @ DAQ PC

⇒ Disk cleanup is finished.

Fiber cables corresponding to VME TDC. and HV cable of TC are re-connected! HV applying to Timing Counter.

Front end. restart. All system comes back again!

07:40. DAC value of FSH52 is changed to 350.

due to take the data of "High gain", "Normal intensity", again.
Yesterday condition

~ 08:30. Test DAQ.

We found some broad pedestal distribution.

⇒ Slot #9 - 33, 34, 35, 36. @ FastBUS ADC.

> Replacement mini card. ⇒ OK.

RUN # 6860 ~ #6863. are Junk, (DAQ test).

08:40. DATA TAKING. RESUMED!

- RUN # 6864. pedestal @ 5e6, Beam Blocker CLOSED.
- RUN # 6865. LED calibration "
- RUN # 6866. Alpha run "

→ Junk data, Since ADC delay cable for slot#33 was unplugged.

We have to calibrate, again.

09:09

RUN # 6867	pedestal	@ 5e6, Beam Blocker closed.
RUN # 6868	LED calib.	
RUN # 6869.	Alpha.	

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09:22. Beam Blocker, OPEN.

09:55

RUN # 6870.	pedestal	@ 5e6. Beam Blocker. OPEN
RUN # 6871.	LED calib.	
RUN # 6872.	Alpha.	

10:14 RUN # 6873. π^0 RUN.

- Trigger : S1 * (NaI4) * (Xenon Fr8/Bk4)
- Gain : 5e6.
- Beam Intensity : Δ proton current, = 180 nA. Δ FSH52 DAC = 350. --- Normal Intensity. Δ S1 counting rate : 1.9M/10^5 protons.
- DAQ counting rate : 25~28 Hz (after PC veto)

10:48 End of #6823. 50000 events taken (incl. ped.).

RUN # 6874 same as previous run. (50000 events)

11:24 RUN # 6875 same as # 6873

11:56. End of # 6825.

We took 150k events in total. (# 6823, 6874, 6825).

12:00. DAC value of FSH52 was changed. 350 ⇒ 125.

and Beam Blocker CLOSED.

12:03. HV error occured. @ HV 13-9. (Bk 5).

Enabling via web. ⇒ OK.

Lunch time .....

30/Nov./2003.

13:08. RUN #6876. pedestal
RUN #6877. LED calib.
RUN #6878. Alpha.
} 5e6. Beam Blocker CLOSED.
(low intensity : FSH52 = 125.)

13:33. Beam Blocker, OPEN.

High GAIN ⊛ Low INTENSITY

13:55 RUN # 6879. pedestal
RUN # 6880. LED calib.
RUN # 6881. Alpha.
} 5e6, Beam Blocker, OPEN.

14:16. RUN # 6882. π^0 run @ low intensity.
- Trigger : S1*(NaI 4)*(Xenon Fr8/Br4).
- Gain : 5e6.
- Beam : ◦ proton current . 1.80 mA
◦ FSH52. = (125)
◦ S1 counting rate : 2.48 M / 10^6 proton
- DAQ. counting rate : 10 ~ 12 Hz

15:26. RUN #6883. same as previous run.

15:30 SCFE down, suddenly. ... restart .... ok.
during this procedure ~~the~~ current run (#6883) was paused.
RUN #6883 resumed.

16:44. RUN #6884. same as previous run.

16:45 ~ beam down, unstable
17:30

18:26 #6885 same as 6884

19:39 #6886 same as 6885

20:56 #6887 same as 6886

22:12 BB closed
let Marco get in to pick some boxes...

22:25 BB open
CFD threshold −80 mv → −240 mV
to reduce trigger rate for 5×10^6 gains

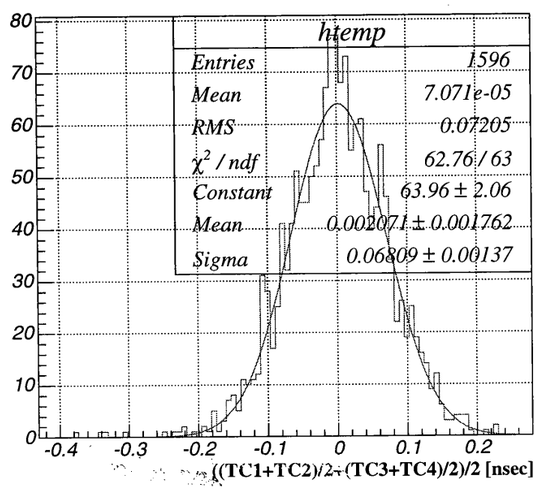
22:36 test run

22:39 #6888 same as 6887 but CFD th was changed.
trigger ~ 7Hz (used to be ~ 12Hz)

1/Dec/2003

0:53 #6889 same as 6888

3:06 #6890 same as 68~~88~~89



resolution of TC
corrected with
- $1/\sqrt{ADC_i}$ $(i=1,4)$
- $(TC_1 - TC_2)$
- $(TC_3 - TC_4)$

$\sigma = 68$ psec

not so good....
Can Yuri's Amp improve it?

5:28 #6891 same as ~~6887~~ 6890

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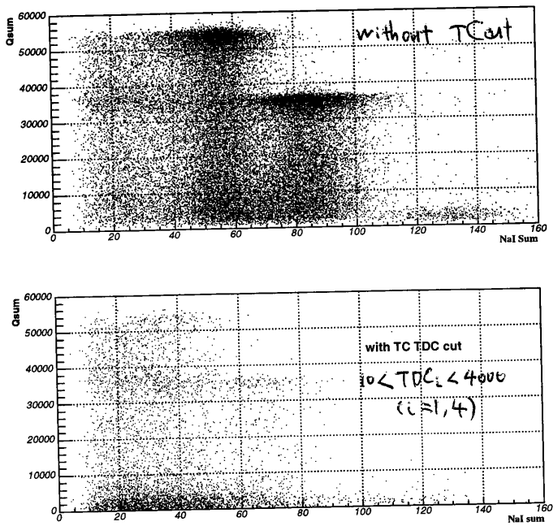

- gamma loses ~20 MeV in lead and counters.
  Is lead too thick?

7:30 Refrigerator STATUS

Cold head Temp 169.96 K

heating power 34.77%

7:44 RUN 6892 Pedestal

RUN 6893 LED

RUN 6894 α

beam on
FSH52 = 125
proton = 1.843 mA

8:03 RUN 6895 π° RUN @ low intensity

TRIGGER SY * (NaI) * Xe (F8, B4)

Gain 5×10^6

Beam 1.816 mA

FSH52 125

50000 events

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10:49 RUN 6896 NaI off Trigger @ low intensity

TRIGGER SY * Xe (F8, B4)

Gain 5×10^6

Beam 1.847 mA FSH52 : 425

TRIGGER request 1.23 M (?) Hz

50000 events

10:30 RUN 6897 Same as RUN 6896

50000 events

10:40 RUN 6898 Xe off Trigger @ low intensity

TRIGGER SY * NaI

Gain 5×10^6

Beam 1.846 mA FSH52: 425

TRIGGER request 1.22 M (?) Hz

50000 events

10:49 RUN 6899 Same as RUN 6898

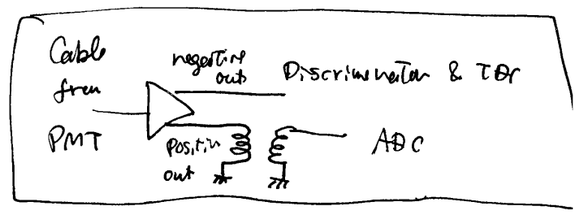
11:09 RUN ~~6899~~ 6900 Same as RUN 6898

11:20 ~ Installation of Turgis AMP.

The amplifier is installed for the following channels

F8	——	3-2
F9	——	3-5
F13	——	3-8
F16	——	3-3
F19	——	3-4
F22	——	3-7
F26	——	3-6
F27	——	3-1

MAERO FAN OUT station & channel



Amplification gain ×10

ADC, TDC assignment is not changed at all.
Only F16 has 3db attenuator for ADC

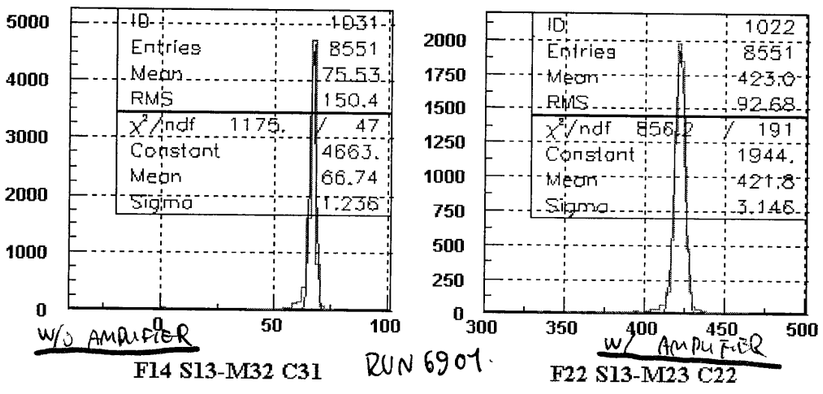
4/Dec/2003

Yuri's AMP STUDY

12°.29 RUN 6901 Pedestal with Yuri's AMP
for 8 channels listed in the previous page

Beam ON
FSH52 = 725
proton 1.843 nA

12°,37 RUN 6902 LED. Beam ON
12°.45 RUN 6903 " "



RUN 6901.

×10 AMPLIFICATION
BUT ONLY ×8 larger pedestal width.
2.54

12°.51 RUN 6904 π^0 RUN, low intensity with Yuri's AMP
TRIGGER S1×(NaI) × X0 (F8 B4)
Gain 5×10^6
Beam 1.816 nA
FSH52 725

Found that several channels with Yuri's AMPLIFIER do not have TDC signals. After investigation of them, we found that this problem is due to base-line shift of Yuri's AMPLIFIER.

Channels without TDC signal
F19
F16
&
F22.

We found that this can be fixed by inserting a capacitor in the output. Yury will modify the module in a couple of hours.

Interruption of Yuri's AMP STUDY

Things to be done by FRIDAY (START of Recovery)

- Yuri's AMP Test.) 5×10^6 / 1×10^6 gain setting.
- Lecce AMP Test.)

FSH52 = 350, FSH52 = 125 if possible.

- TRIGGER efficiency study
  No NaI trigger
  No Xenon trigger. With sufficient statistics
- Remove collimator in front of NaI ?
  NaI QUAD × Xenon.

(• Cold gas data during recovery)

4/Dec/03

14:52 RUN 6905 Pedestal RUN
6906 LED
6907 α
} beam ON, FSH52 425, proton 1.843μA

15:11 RUN 6908 π° S1 * NaI4 * LXe F8BK4. low-intensity (FSH52 = 125) 5×10^6 gain proton 1844μA.

Discrim Threshold −25mV → LeCroy CAMAC TDC

17:44 RUN #6909 π°. Same as #6908. proton 1849μA.

Frontend complains "Invalid VME TDC header! count=60"

Run #6909 Stopped. & restarted Frontend

17:52 RUN #6910 π°. Same as #6908. proton: 1845μA.

17:58 RUN #6910 Stopped to install Yury's amplifier.

Amplifier installed

19:59 RUN #6911 pedestal
20:00 RUN #6912 LED
20:08 RUN #6913 alpha
} beam on, FSH52 : 125, proton 1825μA.

All ~~the~~ channels from the Amplifier was OK!
the TDC

20:15 Run #6913 Stopped.
HV error @ LRS1454.
↳ restarted SCFE.

SCFE couldn't connect to LRS1445.

BB ~~open~~ close

The LRS1445 module was tested using a notebook and found to be ok.

~~pstmp17~~ pstmp17 usb-card was loose. screwed the card and rebooted. → seems O.K.

21:20 BB opened

21:56 RUN #6914 pedestal.
21:59 RUN #6915 LED
22:07 RUN #6916 alpha
} BB open, FSH52 : 125, proton 1815μA
↳ beam was unstable during π-run.

22:28 RUN #6917 π°. S1 * NaI4 * LXe F8BK4
FSH52 = 125
5×10^6 gain
proton 1830μA.

CAMAC Discr-s threshold=25m

Must be collected 100.000 events.
Set the gain = 10^6, send

{ped-s, LED, alpha, π° = 100.000 events.

2 / Dec / 2003

0:48 #6918 same as 6917

3:06 load "leb_031120.hv"

(HV error hvol 8-9 BT29
~~[redacted]~~ change H.V. value of BT29 to 0 V

same channel as 30/Nov 9:00

changed CFD threshold of Xe ~~16~~ 12 sum
from −240 mV to −80 mV
(refrigerator heating power 32.33 %)

3:18 #6919 pedestal
3:19 #6920 LED
3:25 #6921 α
3:35 #6922 S1 * (NaI 4 PMT) * (Xe ~~16~~ 12 PMT)

(gain leb ; Discr-s' thresholds = 25 mV
FJH52 125
with Yuri's Amp
event rate ~ 6 Hz

3:51 stop 6922 to take LED run one more time

change LED Intensity setting
from {90, 92, 94, 96, 98, 99}
to {91, 92, 94, 96, 98, 100}
It is already changed.

3:57 #6924 same as 6922

4:06 stop 6924

Some PMT's gain is strange

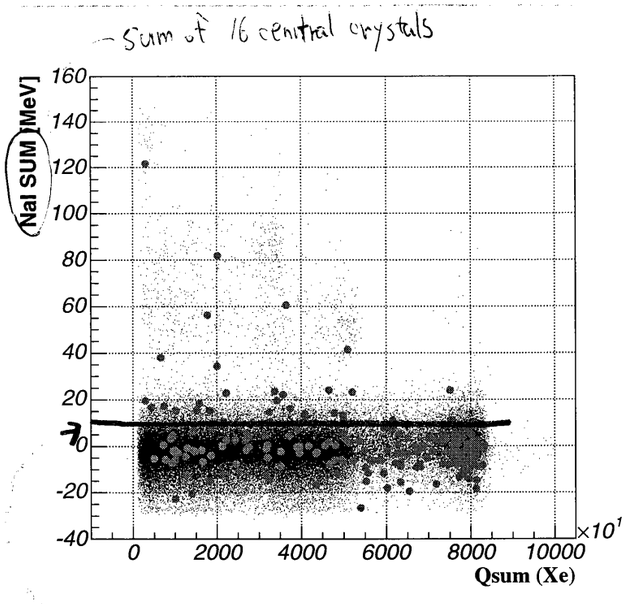
ADC#		
16	F27	? → Due to Yuri's Amp ?
61	L4	→ known
111	F12	~~?~~ → known problem
127	R22	very low → HV setting is 0V
172	L24	→ known
178	BT29	→ known
17 ~ 23		gain1 x10⁸ ⇒ due to Yuri's Amp ? O.K.

(changed HV setting of BT29 to 0V in "leb_031120.hv"
and save as "leb_031201.hv"
recompile frontend
!

4:17 #6925 pedestal
4:18 #6926 LED
4:25 #6929 α
4:40 #6928 same as 6924

Gains = 10^6
CAMAC
Discr-s
threshold = 25mV

S1 * Xe triggered run
(#6897, 6898)



small points - 99785 events
cut: not pedestal

large points - 215 events
cut: not pedestal
∩
10 < TDC(TC1) < 4000
10 < TDC(TC2) < 4000
180 < ADC(TC1)
200 < ADC(TC2)

NaI threshold

2/Dec/03

7:11 RUN 6929 Same as 6922 Gain = $1 \cdot 10^6$; Discr. thresh = 25mV

7:16 Refrigerator STATUS

Cold head temperature 4 69.99K

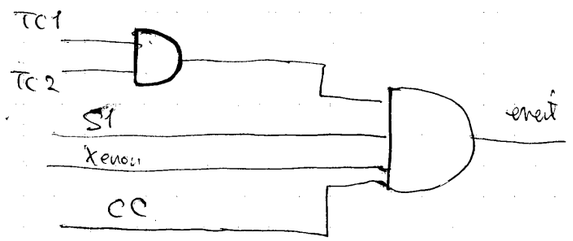
heater power 35.31 %

09:34 Run#6929 stopped by 50.000 events limit.

10:38 RUN 6930 TC is in the trigger instead of Vn1

$S1 * (TC) * Xe \begin{pmatrix} F8 \\ B4 \end{pmatrix}$

FSH52 = 125
proton 4848 μA
trigger rate 2.2 Hz



11:20 RUN 6931 Same as 6930

12:31 Threshold level for the LeCroy CAMAC TDC is found to have been set at −25mV from RUN 6908.

⇨ Changed to −12mV

12:32 RUN 6932

$S1 * (TC) * Xe \begin{pmatrix} F8 \\ B4 \end{pmatrix}$

LeCroy CAMAC Threshold −12mV

FSH52 125

proton 4839 nA

Calibrations for this setup were done after the run See below.

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18:15 RUN # 6933 pedestal

18:16 RUN # 6934 LED

18:24 RUN # 6935 alpha

Beam on
proton = 1859
FSH52 = 125
CAMAC TDC thre. = −12mV

LED unstable.
DO NOT USE !

18:32 RUN # 6936 LED.

18:52 RUN # 6937 LED - test.

19:10 RUN # 6938 pedestal

19:11 RUN # 6939 LED.

use this pair for the Calibration

19:23 RUN #6940 TP $S1 * TC * LXe FSBK4$ (Same as 6932)

Gains = 10^6
LeCroy CAMAC Discr thre = −12 mV.
FSH52 = 125
proton 1866 nA.

19:51 Run paused for repairing Yury's Amp.
Stopped, for installing Lecce's Amp.

21:24 BB Closed

21:40 BB opened

Pb collimeter for NaI are removed.

2/Dec/2003

Lecce's Amp

22:33 Run #6941 pedestal.

22:37 Run #6942 ← LED

22:44 #6943 same as

22:50 #6944 alpha

SCFE died → restarted.

Gains = 10^6

Discr. thresh = 12 mV

proton 1848 μA.

pedestals for ADC ch 16, 17, 18, 20, 21, 22, 23 are not present. (too low)

7 channels out of 8 channels where the Lecce's amp. is installed.

pedestal for ADC ch 19 is too high. (~800 counts).

23:15 Run #6945 test run.

un-plugged the Lecce's Amplifier.

23:31 Run #6946 pedestal

23:32 Run #6947 LED

23:38 Run #6948 alpha.

SCFE died → restarted.

FSH52 = 125

Gains = 10^6

Discr. thre = −12 mV

proton = 1845 μA

w/o AMP

w/o NaI-Pb collimator

23:45 #6949 α

23:55 #6950 S1 * (NaI Quad) * (Xe F8Bk4)

w/o Amp
with TC
w/o NaI Pb collimator
FSH52 = 125
gain = 10^6

event rate ~55 Hz

3/Dec/2003

0:19	#6951	same as 6950	comments of these files are wrong "w/o Yuri's Amp" is correct
0:35	#6952	same as 6951	
0:57	#6953	same as 6952	
1:18	#6954	same as 6953	
1:36	#6955	same as 6954	
1:53	#6956	same as 6955	
2:11	#6957	same as 6956	SCFE crashed during this run
	#6958	same as 6957	
2:51	#6959	same as 6958	

3:46 load "le6_qe_031126.hv"

change HV of BT29 to 0

save as "le6_qe_031203hv"

3:48	#6960	pedestal @ le6_qe gain (Q.E. normalized)
3:49	#6961	LED
3:55	#6962	α (refrigerator heating power = 38.47 %)
4:05	#6963	(S1)*(TC)*(Xe F8Bk4)
6:38	#6964	(S1)*(TC 3*4)*(Xe F8Bk4)
7:01	#6965	(S1)*(TC 2*4)*(Xe F8Bk4)
~7:16		BB close
		lead plate of TC has dropped!! ⇒ put lead on TC again
~7:46		BB open (It falled off 29/Nov 0:15)
7:54	#6966	same as 6965 but with lead of TC

3/Dec/2003

8:58 stop 6966

13:00 Xenon controls: all O.K.

14:55 " : still O.K.

~~The~~ The Gain of the splitter for the Lecce's amp was changed from ×10 to ×1.

16:00 Run #6967 pedestal.

16:04 Run #6968 LED

) the amplifier was not powered-on. ↳ powered-on.

16:19 Run #6969 pedestal

16:24 Run #6970 LED.

18:09 Run #6971 LED

18:34 #6972 LED

} A reasonable ADC data appear starting from step 3. Probably output signals' baseline shift spoils the whole channel operation.

Lecce's Amp. removed for inserting capacitors into outputs.

Lecce's Amp back again with Capacitors, Gain (×10)

19:05 Run #6973 pedestal

19:05 Run #6974 LED

22:00 BB open

22:31 Run #6975 pedestal

22:33 Run #6976 LED ← LED unstable.

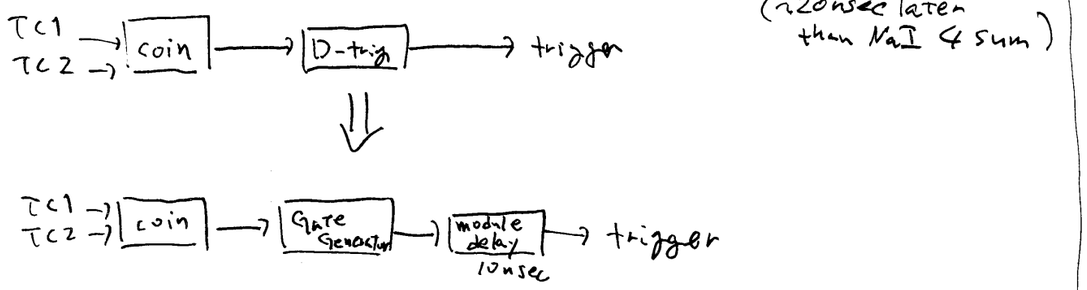
22:36 Run #6977 LED

22:42 Run #6978 alpha

10^6, ge corrected gain
BB open.
proton 1822μA.
FSH52 = 125.

3/Dec/2003.

changed logical circuit to make TC1&2 trigger because D-triger is too slow (~20nsec later than NaI 4 sum)



Timing is adjusted so that timing of TC1&2 and NaI Central 4 is same

Amplifier removed: pedestals of ~~ADC~~ ADC ch 17, 18, 19 are still low.

23:25 Run#6979 pedestal w/o Amp

23:26 Run #6980 LED. 10^6, ge corrected gain proton 1845 nA FSH52 = 125

23:32 Run #6981 LED. test ← LED unstable

6982 LED test.

23:47 Run #6983 LED test.

23:54 Run #6984 LED

24:00 Run #6985 alpha.

24:20 Run #6986

frontend.c was modified to flash all the 6 chs of CAEN LED driver.
LEDs are now connected to ch 2 & 3. (it was ch 0&1)

SI * TC(1&2) * Xe (F18. BK4) w/o Amp.

trigger setting was not correct. (TC input was off at coincidence module). proton 10^6_ge corrected gain.

→ fixed. run stopped.

4/Dec/2003.

0:24 Run #6987 Si * TC (1 & 2) * Xe (F8. BK4)
- w/o Amp.
- 10^6 ge corrected gain.
- proton current 1.841 mA
- FSH52 = 125.

1:33 Run # 6988 pedestal
- w/o Amp., 10^6 ge corrected. FSH52 = 125.

1:34 Run # 6989 LED

2:15 PMT HV value changed to 5×10^6 with ge correction value.
(load 5eb_ge_031126.hv).

2:45 Run # 6990 pedestal
- 5×10^6 ge.cor.
- proton current 1.848 mA
- FSH52 = 125
- W/O Amp.

2:45 Run # 6991 LED ← Junk.
↑ mistake.

Run # 6992 LED

2:50 Run # 6993 alpha

3:00 Run # 6994 Si * TC(1 & 2) * Xe (F8. BK4)

High gain, low intensity run.
5eb_ge. FSH52 : 125
proton 18~40 μA

$\frac{4312-3545}{3545} = 4.7\,Hz$

HV error occured. — HV #8-9 (BT29) → fixed.
again, HV error occurred. at the same channel.
this time. we couldn't fix the channel. → set to 0 V.
same channel as 30/Nov, 2/Dec. → modified.
5eb_ge_031126.hv

4/Dec/2003

4:50 Run # 6995 Si * TC (1&2) * Xe (F8, BK4)
same as #6994.
SC FE stopped. abnormally. → restarted. ⇒ O.K.
CFD threshold of Xe (F8, BK4) sum was changed from -80mV to -240mV.
for 5×10^6 gain HV setting.

5:13 Run # 6996 Si * TC(1&2) * Xe (F8, BK4)
same as # 6994 except for CFD thre. -240mV.

HV settings:
1e6_031201.hv
Loaded → [illegible]

10:?? Run #6997 pedestal
10:?? #6998 LED ← unstable?
10:16 #6999 Alpha

} Gain = 10^6
Discr. thresh = 12mV
Beam OFF
Lecce Amp. x10

No Beam FROM ~~9:39~~ 8:07
" Iy-2 Proton source not OK"

13:54 Beam available

14:12 Run # 7000 pedestals
RUN # 7001 LED RUN COMMENT WRONG INTERRUPTED

14.17 RUN # 7002 LED

14:25 RUN # 7003 alpha.

RUN # 7004
Si * TC(1&2) * Xe (F8. BK4)
10^6 gain. Lecce AMP x 10
FSH 52 = 125

4/Dec/2003

22:40 BB ~~closed~~ opened — to check the TCs.
↳ No problem.

22:50 BB opened

Yury's Amplifier installed

23:?? Run #7005 pedestals ; ped-s ≈400..500! ??!
23:56 Run #7006 LED

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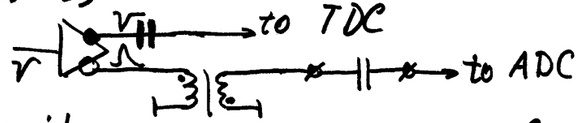
00:12 Run #7007 pedestals

Channel F13 :



Insertion of the capacitor into the ADC signal path made the F13 (ADC #23) pedestal = 131.5 (instead of ~513)
Conclusion: ADCs have their own „Input offset voltage".
They require input signal to be fed through a DC-decoupling capacitor!
Decision: to take data with ADC signal paths „as is".

00:37 Run #7008 pedestals
00:40 #7009 LED ← a little unstable
#7010 LED
00:56 #7011 LED ← GOOD
#7012 α

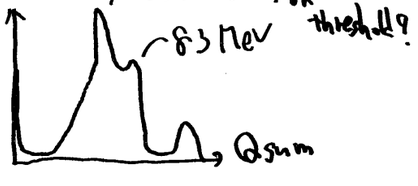
Gains = 10^6
Discr. thresh = 12mV
BB ON; proton = 1.838mA
FSH52 = 125
Trigger = S1*TC(1&2)*LXe

00: Run #7013 JT0

stop 7013

CFD threshold for Xe12Sum
-240 → -80 mV

CFD threshold was too high from 10:00 yesterday to take leb gain data



It is necessary to take leb gain with Yuri / Lecce Amp one more time.

6:54 #7014 S1 * (TC 1&2) * (Xe F8 Bk4)
leb with Yuri/Lecce Amp.

- proton current 1.898 mA
- FSH52 = 125

12:41 Run #7015 JT0 — ~~start~~ stopped for making Calibrations.

12:44 Run #7016 pedestals
12:46 #7017 LED
12:52 #7018 α
12:59 Run 7019 Pi0

Gains = 1.10^6
Discr. thresh = 12mV with Yury's Amp.
BB = ON, proton = 1.834
FSH52 = 125
Trigger = S1*TC(1&2)*LXe(F8 Bk4)

14:39 RUN 7019 end for installing Italian Timing center prototype to the area.

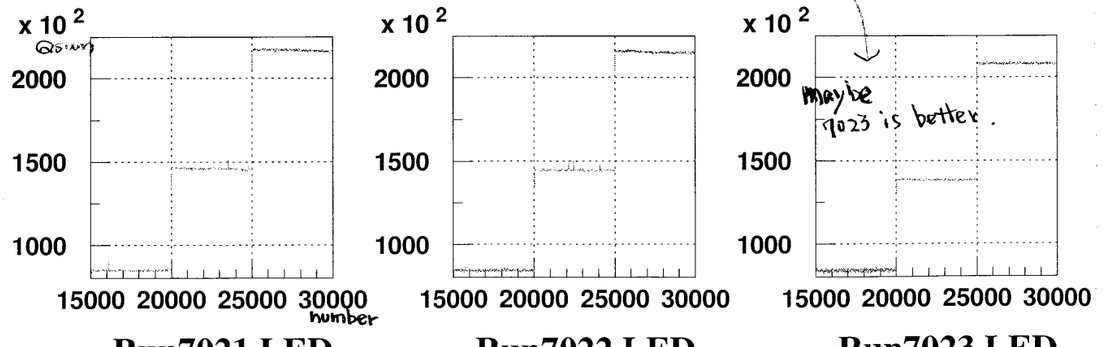
14:40 BB closed
14:52 BB opened

?? BB closed
15:30 BB opened

Lecce's Amplifier installed

15:52 Run #7020 pedestals
15:55 #7021 LED ← unstable
16:02 #7022 LED ← sligtly unstable } which is better?
16:08 #7023 LED ← unstable }
16:16 #7024 α epha
16:21 Run #7025 JT0

Gains = 1.10^6
Discr. thresh = 12mV
BB = ON, proton = 1.877
FSH52 = 125
Trigger = S1*TC(1&2)*LXe(F8 Bk4)
with Lecce's Amp.



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21:46 Run #7025 end. (50000 evts taken)

21:47 RUN#7026 TC0 same as 7025

22:55 Run #7026 stopped. (10.000 events taken).

23:00. BB closed

23:05 BB opened

Lecce's Amplifier removed.

23:20 Run #7027 pedestals
23:22 #7028 LED ← unstable
#7029 LED ← good
23:34 #7030 α

23:40 BB closed — From Italian group's request.
23:52 BB opened

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0:10 Run #7031 pedestals — Gains = $1 \cdot 10^6$
0:12 #7032 LED ← unstable — Discr. thresh. = 12mV
0:17 #7033 LED
0:24 #7034 α — BB = ON, proton = 1.856
FSH52 = 125
00:29 Run #7035 π⁰ — Trigger = S1 * NaI(Quad) * LXe(F8 Blk 4)
00:51 #7036 π⁰ same as #7035 — event rate ~55Hz
1:10 #7037 π⁰ same as #7035 → total 150,000 events taken. #7035, 7036, 7037.
1:55 Run #7038 π⁰ trigger = S1 * NaI4 * Xe 8clusters
→ trigger setting was wrong. → stopped.
2:10 #7039 π⁰ same as #7038
2:30 #7040 π⁰ same as #7038 event rate ~ 38 Hz
2:55 #7041 π⁰ "

6/Dec/2003

★ Run comments from 6997 ~ 7036 was wrong.
HV setting was not ge corrected value.
" " @ leb_ge should be " @ leb

3:20 load " 5eb_ge_031126.hv "
CFD threshold of Xe(F8 Blk4) sum was changed −80mV → −240mV
for high gain run.

3:45 Run # 7042 pedestal
3:46 #7043 LED
3:54 #7044 alpha
4:03 #7045 π^0 trigger = S1 * TC(1&2) * Xe(F8 Blk4)
High gain, low intensity run
5eb_ge, FSH52: 125
proton 1.856 mA
$\frac{915-362}{362} = 1.5$ Hz

7:00 Refregirator Status
170.05 K / 34.7% power.

9:02 #7045 stopped to start recovery of Xe
@ ~ 31000 evts w/o pedestal events

9:29 #7046 pedestal Beam OFF
#7047 LED "
#7048 alpha "

~~to be continued~~

6/Dec 2003

start recovery

10:00 stop compresser

bottom heater on @ 30V ~ 4.3 A

11:00 start Xe gas flow

11:30 fill Outer vessel with 0.3 atm of N_2 gas (99.9999%)

".mid" files are sychronized between {pstmp17, llc, archivftp} up to #7044

HV error 7-5 BT19 → enabled O.K.

22:40 HV error 7-5 BT19 → N.G. → set to 0V.
16-4 F7 → enabled. O.K.

0:11 HV error BT19 182.1 μA !!
HV for BT19

HV error 6-2 L21 → 0V

~~1:15 HV error 6-2 L21.~~

2:10 HV error 17-3 F8 → N.G. → set to 0V

3:00 HV error 18-0 F33 → enabled O.K.

2:30. MSCB control seems to be disconnected (monitor value something wrong).
MSCB crate rebooted.
All Monitor values except for temperature values recovered.

7/Dec/2003.

- temperature related value is connected to "SCS700" module3 in MSCBcrate.
- this module seems to be no response.
  → should be checked.
  → address was changed to 0xFFFF → set to 3 O.K.

4:40 HV error 17-2 F27 → enabled O.K.

4:50 HV error 17-2 F27 → N.G. → set to 0V (198 μA)

5:25 HV error 2-4 R10 → ok.

5:50 HV error 1-4 R4 → ok

5:55 HV error 8-4 R28 → ok

8:50 HV error 8-[redacted] R29 → ok.

Xe level is lower than "Level meter = 0%"

11:20 loaded hv setting 5e6_031126.hv for cold GXe α Run

11:50 reboot PC, ~~stop~~ pause recovery, start compresser control 1.8~1.82atm
load "5e6_031126.hv"

HV error
6-2 L21 → 0V
7-5 BT19 → 0V
~~15+2~~ [redacted]
17-2 F27 → 0V
17-3 F8 → 0V

11:56 #7046 pedestal
11:58 #7047 LED
} during these runs logger didn't run. temperature holder up -65°C holder low -83°C

start logger

12:04 #7048 pedestal
12:06 #7050 LED Bad
12:12 #7051 α
} with 5e6 — beam off

7/Dec/2003

12:21 #7051 load ┐ 5e6_ge_031126.hv
12:24 #7052 pedestal │ with 5e6_ge
12:25 #7053 LED Bad │
12:31 #7054 α ┘ 0.174 after MPa holder up -82.9°C low -80.8°C

changed LED intensity to {90.92.94.96.98.99}
~~{91.93.95.97}~~
from {92.94.96.98.100}
91.

12:54 #7055 LED Failure
12:54 #7056 LED HV error 17-6
12:57 #7057 LED Bad F12

LED run # 7050 was bad so take 5e6 data again.

load 5e6_031126.hv

L21
BT29
F8
F27
→ 0V

5e6

13:07 #7058 pedestal
13:08 #7059 LED Bad → Failure

changed intensity
{89.90,91,92.93,94}
{87,88.89.90.91,92}
⇒{88.89.90,91.92.93}

13:27 #7063 LED
13:33 #7064 α holder up -92.9
holder low -83.25
press 0.186 MPa

13:42 #7065 pedestal

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~~LED~~ LED run # 7057 was bad so, take 5e6_ge again.

load 5e6_ge_031126.hv

L21
BT29
F8
F27
⇒ 0V ✓

5e6_ge

13:49 #7067 pedestal
13:50 #7068 LED ⇒ failure
13:52 #7069 LED
13:58 #7070 α

holder up -86.2 °C
" low -81.4 °C
press 0.184 MPa

14:01 load 1e6_ge_031203.hv

L21
BT29
F8
F27
⇒ 0V

#7071 ~~pedestal~~ LED failure.
changed LED intensity
{91,92.94.96.98.100}

#7072 LED failure.
changed LED intensity
{90.91.92.93.94.95}

14:27 #7073 LED
#7074 α → failure. (threshold seemed high)

1e6_ge

NIM threshold -75mV → -40mV

14:34 #7075 α
14:47 #7076 pedestal
14:49 #7077 α
14:57 #7078 α
15:06 #7079 α
15:16 #7080 α ← during this run
SCFE stopped. restarted

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15:27	#7081	α	← during this run HV error accured
15:30	HV.error	6-2	
		7-5	
15:36	#7082	α	
15:44	#7083	α	
15:52	#7084	α	
16:01	#7085	α	

16:09 load leb_031201.hv

L21
BT29
F8
F27
⇒ 0 V

HVerror

16-6 F25
7-5 BT19 (190μA)
⇒ 0V

16:24 #7086 pedestal

16:26 #7087 LED

16:33 #7088 α

↓ # of bottom events was very few.

holder up -83.8°C
" low -77.8°C
pressure 0.185 MPa

16:59 HV error BT8 → 0V
BT9 → 0V

F16	896V → 996V	bottom α events trigger PMT.
F17	988V → 1088V	
F22	1078V → 1178V	
F23	992V → 1092V	

(#7089 ~ 7091 ... test run)

17:10 #7092 pedestal

17:12 LED #7093

17:21 alpha #7094

17:30 alpha #7095

17:39 alpha #7096

17:48 alpha #7097

17:57 alpha #7098

18:06 alpha #7099

18:15 alpha #7100

18:25 alpha #7101

Disk full. ▶ Some files were removed on C:\

18:50 Alpha #7102.

18:50 " #7103.

18:58 " #7104.

19:06 " #7105.

19:16 " #7106.

19:24 " #7102.

19:35. HV of all PMT. turned off.

19:50. front end, down.
All equipment for DAQ, turned off.

Refrigerator Stop.

16

7/~~Dec~~./2003.

19:41. Recovery resumed.

20:13 outer vessel ~~evacuation~~ started.
heater turned off

22:17 Xe Tank valve closed

Recovery finished

8/Dec/2003

11:30 fill chamber with N_2 gas inner 0.8 atm
outer 0.5 atm

Start heating
setpoint = 30°c

(Valves between chamber and Xe line are open.
Pleas close before disassembling Vacuum lines.

16:30 mscb trouble module 3 (temparature moniter)
set address to "3" from wrong address "0XFFFF"

[c /midas/mscb/msc.exe
Scan → ad 0XFFFF → sa 3 3 → o.K.]

Data Storage

ftp://archivftp//archiv/project/meg/2003_1/
- data ... .mid
- online ... online program etc.
- slowcontrol ... slowcontrol program / data

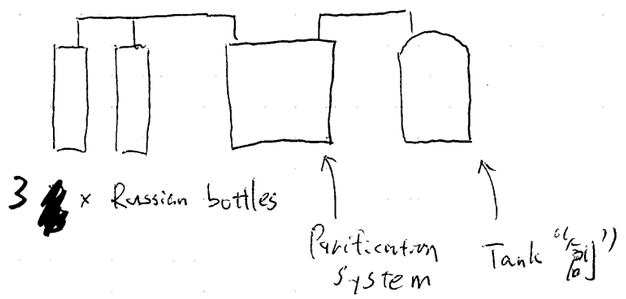
afs//afs/psich/project/meg/2003_1/
- .mid
- offline program etc
- calibrated rz
- calibration files

ftp://archivftp//archiv/project/meg/2003_1/
- data .mid
- online online program and data
- slowcontrol slowcontrol program and data

afs://afs/psi.ch/project/meg/2003_1
- data .mid
- calib caribrated .rz , constants, data
- odb .odb
- online online program, data
- offline offline program, data
- slowcontrol slow control program, data

5/Jan/2004

16:00 assemble of Xe transfer line → start evacuation



16:20 Xe Transfer line 5.5×10^{-4} Pa

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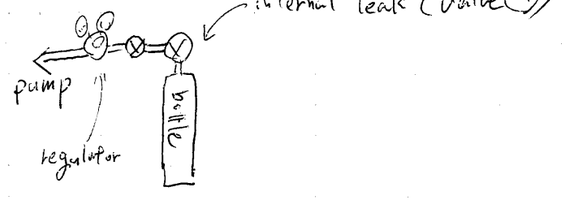
10:00 Xe transfer line 2.7×10^{-4} Pa

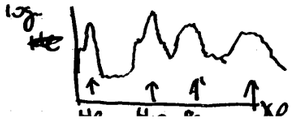
An internal leak is found at the valve on Russian bottle.

Purge with Xe



① Evacuation 4.0×10^{-4} Pa
② open valve-1 → ~ 59 atm
③ evacuation ~ 3.0×10^{-1} Pa
④ open valve 1
⑤ evacuation ~ 3.3×10^{-1} P

checked contamination of Air in Xe



Contamination is not so much.

15:00 baking of vacuum line between Purification System and Tank.
60.

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8:40 4.4×10^{-4} Pa ⇒ baking off

re-tighten volts (bolts?)

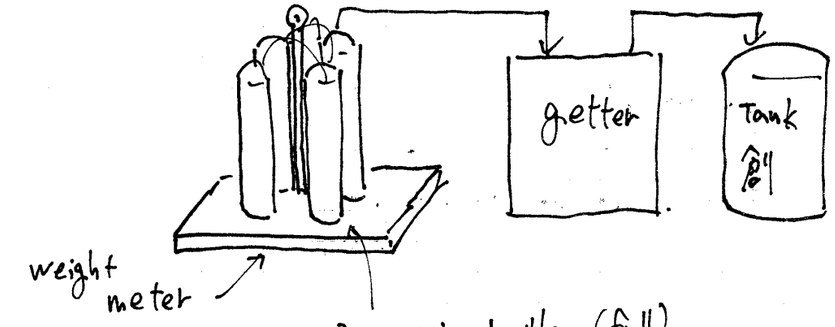
10:05 3.7×10^{-4} Pa

russian Xe re-bottling

450.12 kg

(We will move transfer 55 l × 2.957 = 162.5 kg Weight will be 287.7 kg)

15:40 start re-bottling (59 atm)



19:05 the first bottle is finished

426.28 kg (1atm of Xe is remaining in the 1st bottle)

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9:00 remained 1atm of Xe in the 1st bottle
is moved to Tank #9

426.14 kg

(24 kg of Xe was present in the 1st bottle)

9:45 start rebottling of the 2nd bottle
~70 atm

10:30 rebottling of the 2nd bottle is finished
(but 0.15 atm of Xe is still remaining bottle 2)

360.64 kg

("close Tank and fill transfer line" with ~1.1 atm of Xe from bottle 3
~67 atm)

(65.5 kg of Xe was in the 2nd bottle)

360.50 kg

getter off

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15:10 360.40 kg

15:20 start rebottling the 3rd bottle
~65 atm

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1:10 rebottling of the 3rd bottle is finished

306.10 kg

open valves on the top of three bottles → collect remaining Xe

306.06 kg

close all valves
getter off

(53.8 kg of Xe was in the 3rd bottle)

Sammery of Xe rebottling.

(summary?)

1st	bottle	240 kg
2nd	"	65.5 kg
3rd	"	53.8 kg
total		143.3 kg ~ 48 l (liquid)