RIBF017-2

NIRS

HIMAC

Log #2 RIBF17/K

001 5/11(月) 朝 7:30

8:20

板橋さん : 終わり.

8:25〜
中で状況の確認をする

① K

水 in 9気圧 29°C

out 3気圧 35°C

流量 250ℓ/min

1100A (のはず)

② DC

He+CH4 48気圧 / 0.3気圧

BDC 5cc/min

FDC1 6

FDC2 7

FDC3 6

アルコール レベル OK

6.4°C (室 24.8°C)

③ He

残 7気圧 ← 注

0.5気圧 → 少し下げる しばらく見る. 8:30〜 0.35気圧 8:45 一応安定した.

taget 5 (He)

F23 15 (He)

下 10 (Ar+iC4H10)

バブラーはすべてリターンあり

HOD 1380V − X

後から見て

H 7 ←—— H 1

- - - - Hegasをあてている間.

ΔEL, ΔERと beamのtimingはあっているので targetを(4mm↑)をはずす.

targetをはずして ΔEを±39°にset.

ホゴ板は作業中につけてから はずす.

° beam stopper 13.5°

° FDC2/3/hod +440/13.5°

HOD +240

下流側 キビう 閉 8:50」

標的

0

"200mg" HO2 (193mg)

"400mg" HO1 (386mg)

"600mg" #11+12+13+14+15+16 〜600mg.

"800mg" は"600mg"+(#17+18)
↓
上流側にはりつける

9時ヒ負 ～

上流から　板橋モード ⟶ 通常モード
　　↓
FOまで cross talk

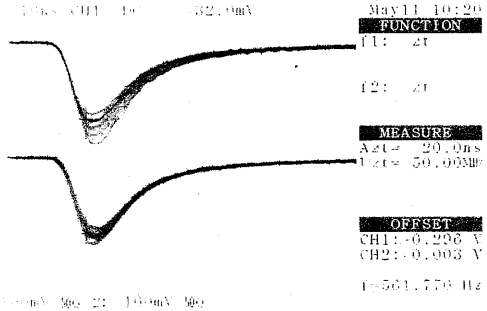
～10:00

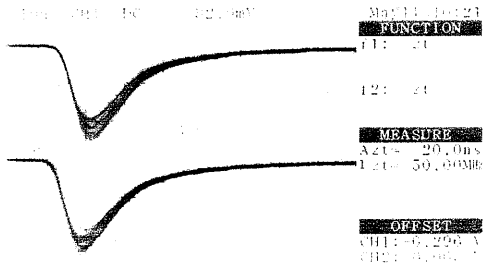
SF12A,B on　1100V, 980V , 1100V　1100V　～1KHz

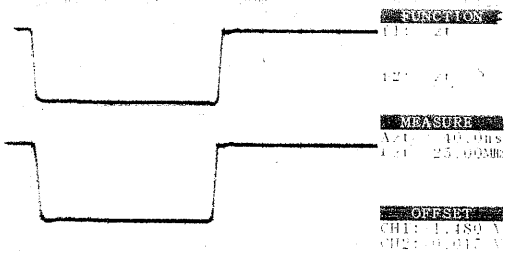
Aは ≈200mV ⟶ 230mV　200mV
　　1100V　980V
　　⇓
　　980V
　　200mV

Bは 300mV, 200mV
　　1100V　1100V
　　↓　↓
　　1070V　1120V
　　200mV　200mV

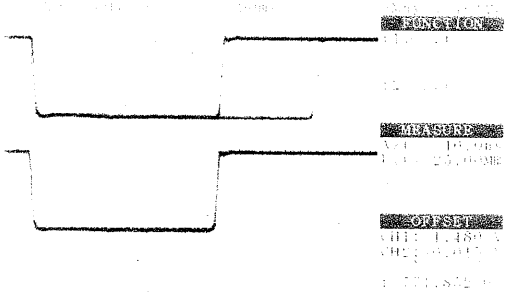
F12 A	980V	980V
B	1070V	1120V



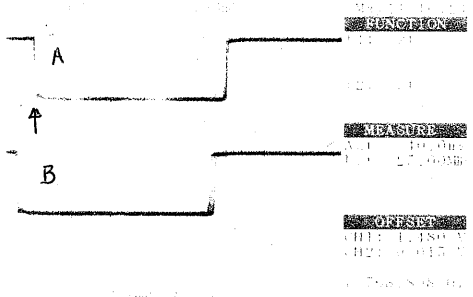




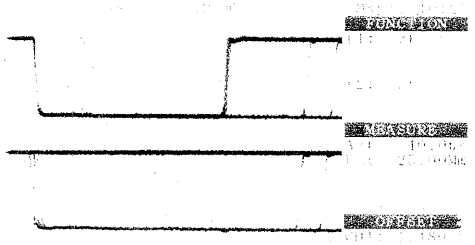
AL × AR



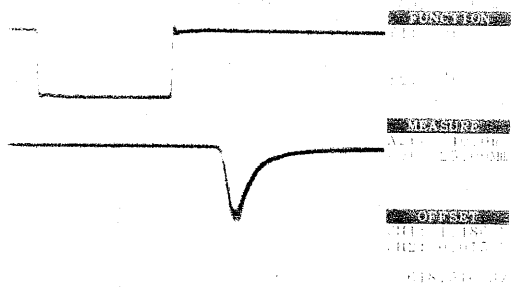
BL × BR



A × B

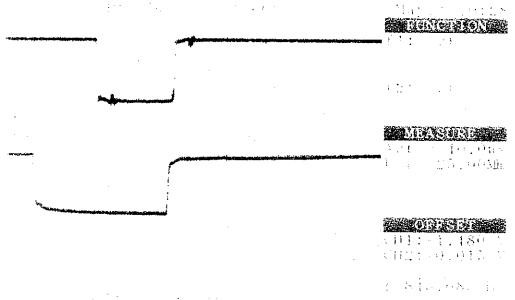


ΔEL × R

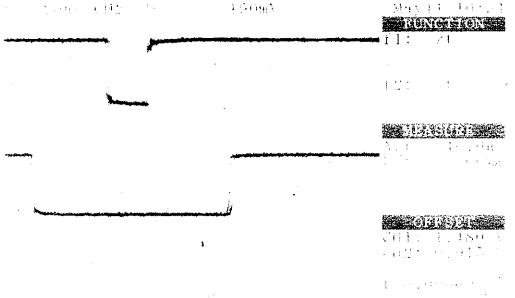


W → かなり広くsetしてある

ΣL·R 100μsec delayed



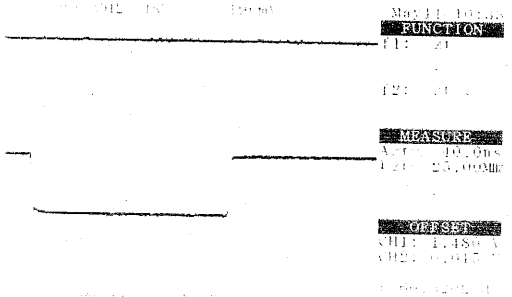
A*B
W
→ Beam ‖ (A*B)*W



Beam delayed

ΔEL*R

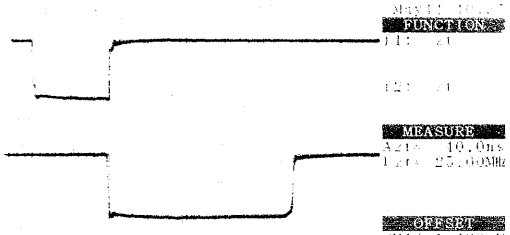
ΔEL or Rは
20Hzくらいある.
@beam=1kHz



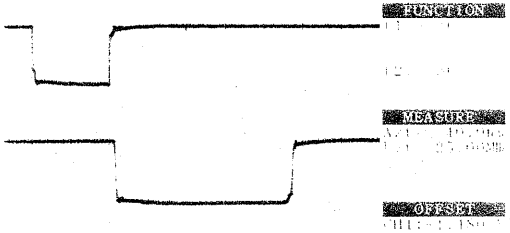
beam

ΔEL or ΔER

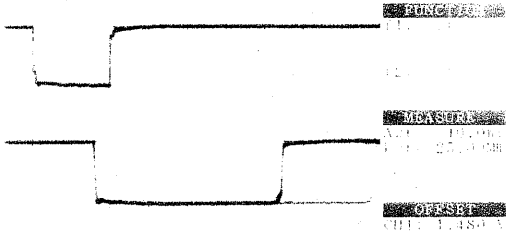
TDC



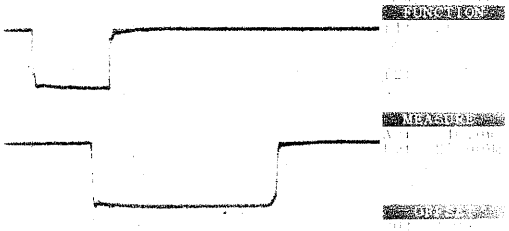
step 1



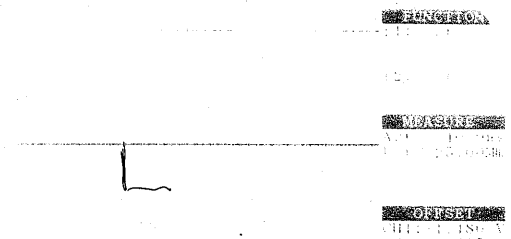
2



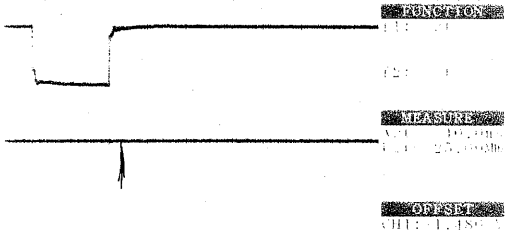
3



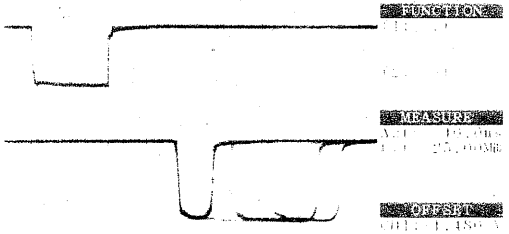
4



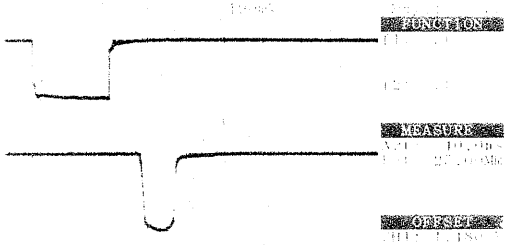
step 5



6

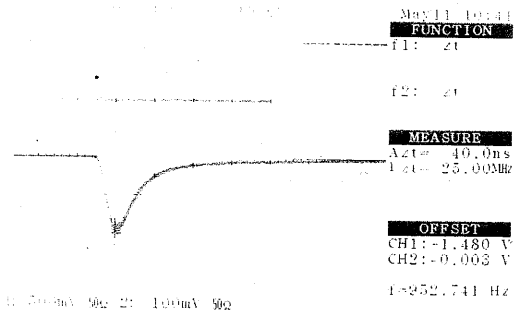


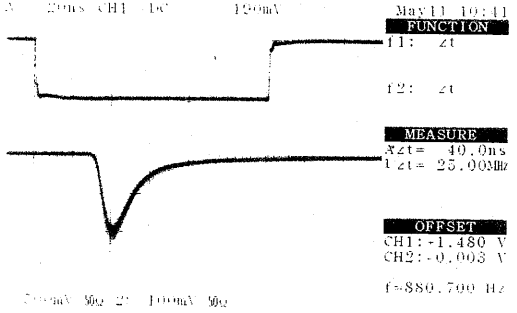
7 T-F3

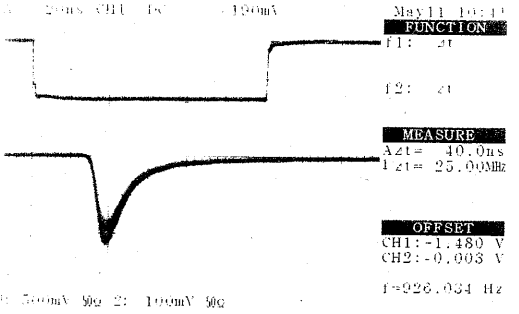


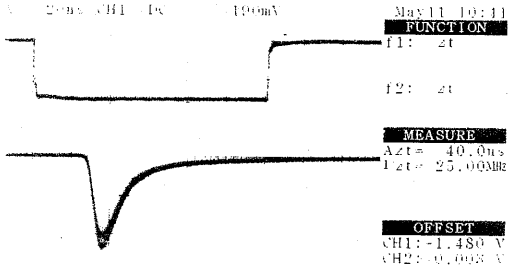
8 T-F1

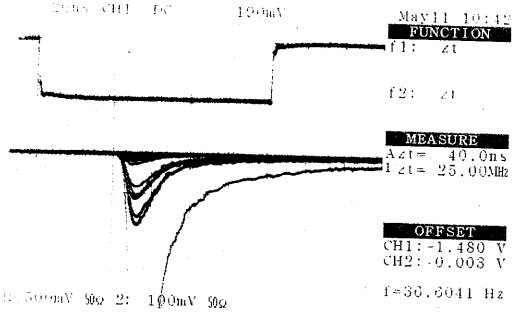
ADC

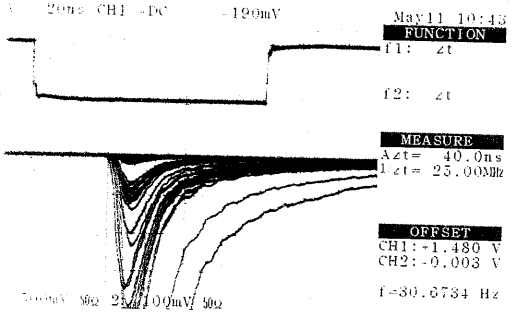

FUNCTION
f1: Zt
f2: Zt
MEASURE
Δzt= 40.0ns
1/zt= 25.00MHz
OFFSET
CH1:-1.480 V
CH2:-0.003 V
f=952.741 Hz


May11 10:41
FUNCTION
f1: Zt
f2: Zt
MEASURE
Δzt= 40.0ns
1/zt= 25.00MHz
OFFSET
CH1:-1.480 V
CH2:-0.003 V
f=880.700 Hz

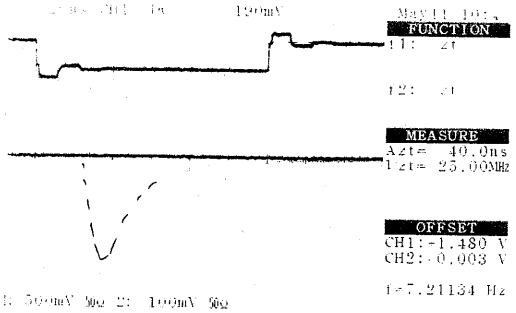

FUNCTION
f1: Zt
f2: Zt
MEASURE
Δzt= 40.0ns
1/zt= 25.00MHz
OFFSET
CH1:-1.480 V
CH2:-0.003 V
f=926.034 Hz


May11 10:41
FUNCTION
f1: Zt
f2: Zt
MEASURE
Δzt= 40.0ns
1/zt= 25.00MHz
OFFSET
CH1:-1.480 V
CH2:-0.003 V


May11 10:42
FUNCTION
f1: Zt
f2: Zt
MEASURE
Δzt= 40.0ns
1/zt= 25.00MHz
OFFSET
CH1:-1.480 V
CH2:-0.003 V
f=30.6041 Hz

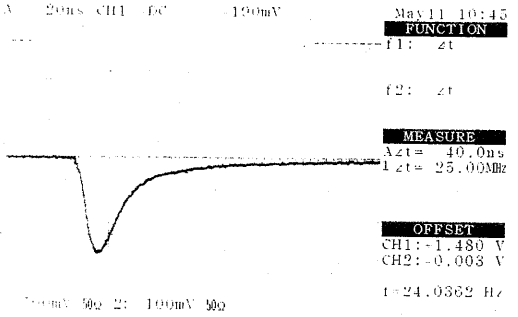

May11 10:43
FUNCTION
f1: Zt
f2: Zt
MEASURE
Δzt= 40.0ns
1/zt= 25.00MHz
OFFSET
CH1:-1.480 V
CH2:-0.003 V
f=30.6734 Hz

FERA



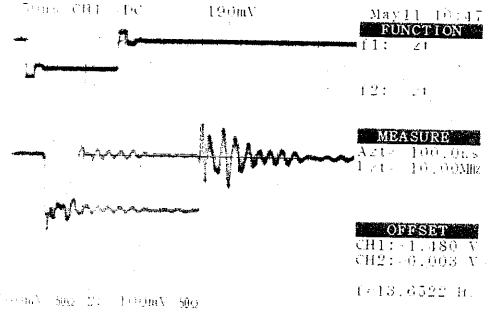
← FERA gate
(NIM-ECL 変換かる)

H4 up



H4 dn

10db
1380V-α) 後。



Fera_ADC gate (ref)

TFC out

~10:30

DC-HV かける

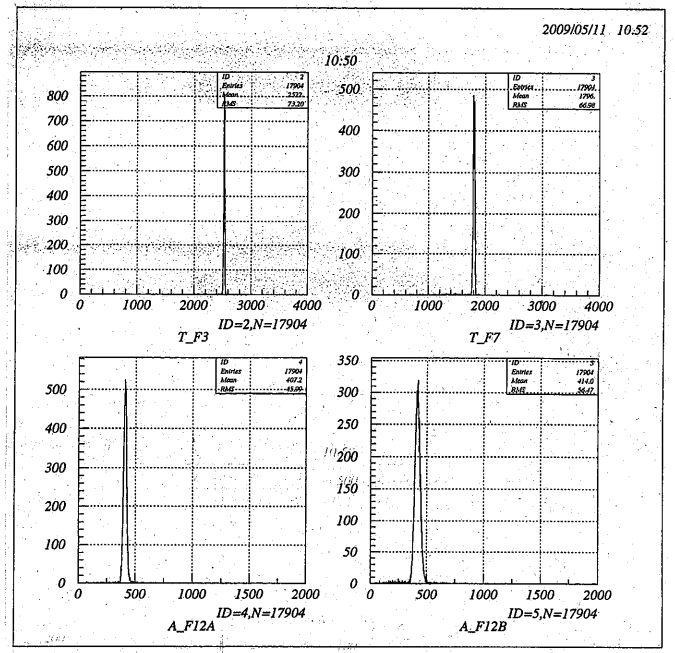
Run 423 と同じHV

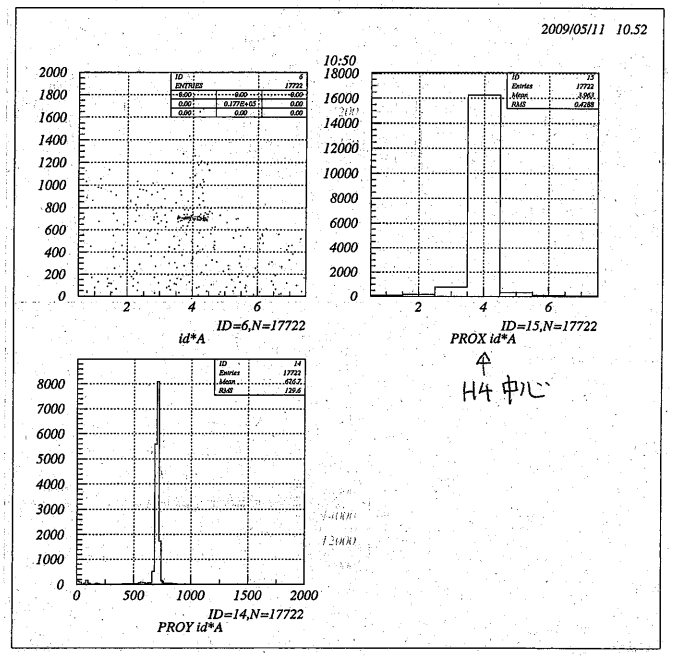
beam ~ 1.7kHz

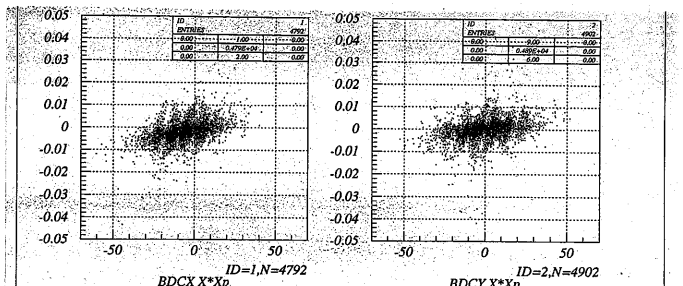
BDC	-2050	~40nA
FDC1	+1150/-2500 (5.95mA)	~30nA
FDC2	-2300/-1442	~30nA
FDC3	+875/-2500 (3.34mA)	15~20nA

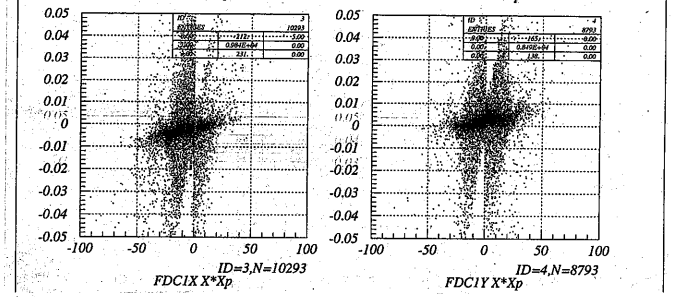
~10:45

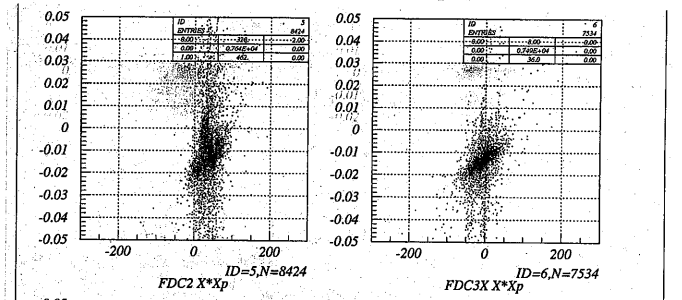
beam の phase space を見る



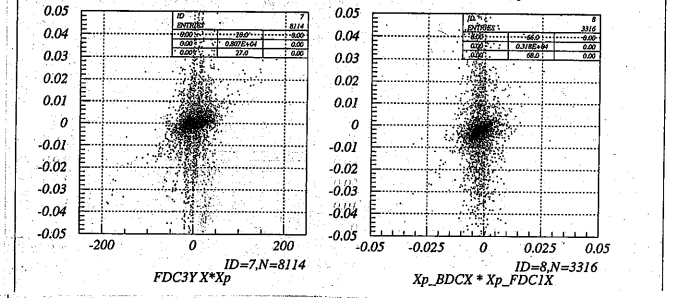


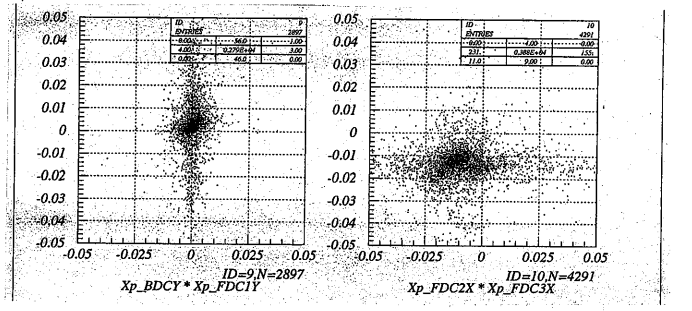




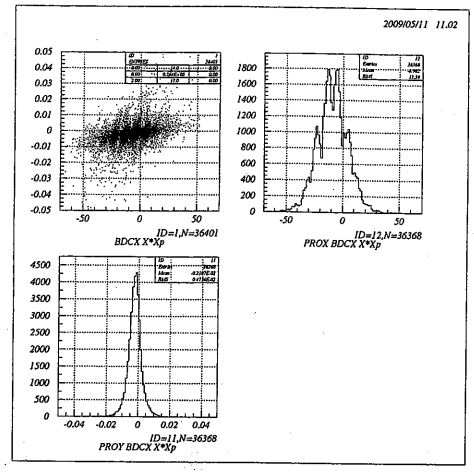


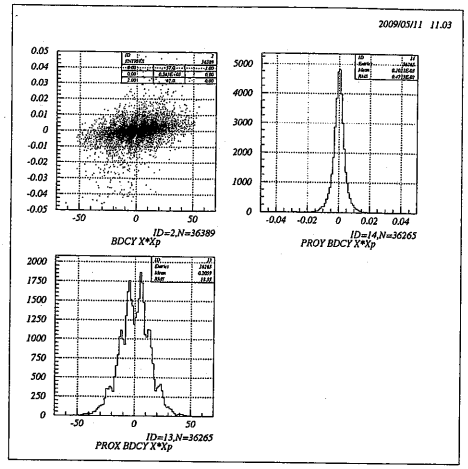
FDC3 の X, Y とも 中心

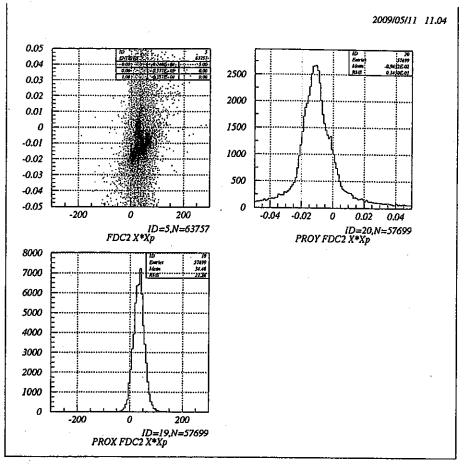


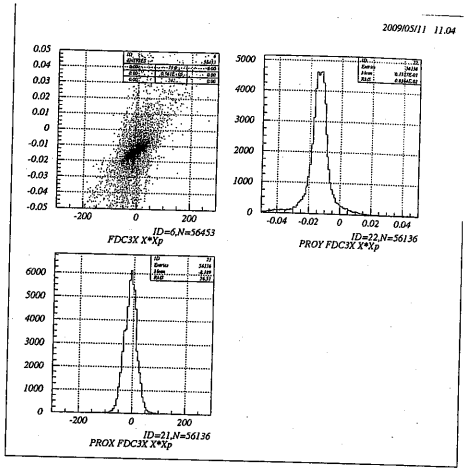


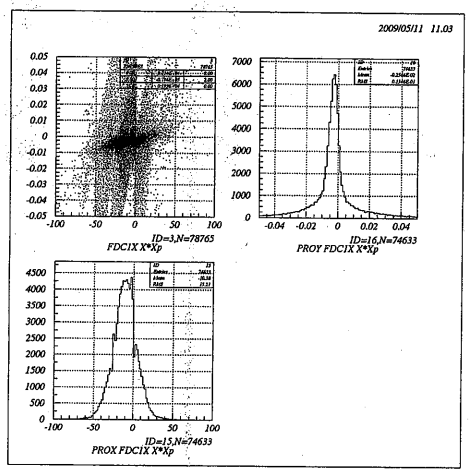
5/9 条件と同じで.

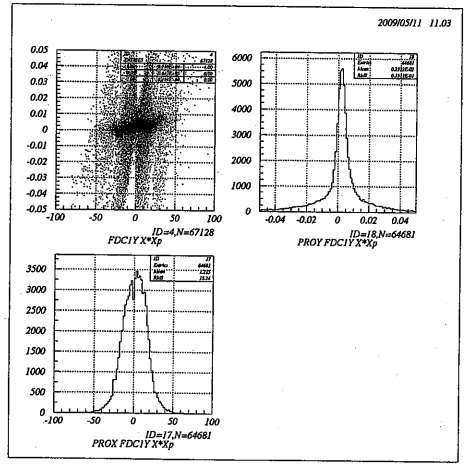

2009/05/11 11.02
ID=1,N=36401
BDCX X*Xp
ID=12,N=36368
PROX BDCX X*Xp
ID=11,N=36368
PROY BDCX X*Xp

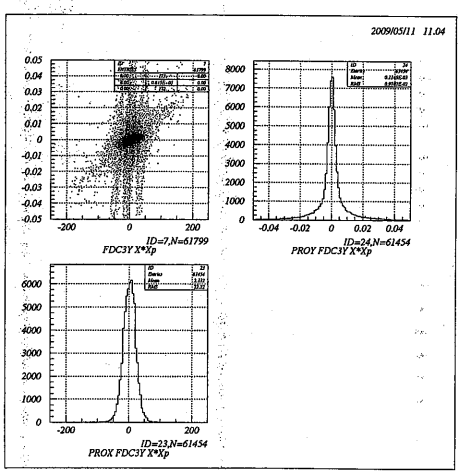

2009/05/11 11.03
ID=2,N=36389
BDCY X*Xp
ID=14,N=36265
PROY BDCY X*Xp
ID=13,N=36265
PROX BDCY X*Xp


2009/05/11 11.04
ID=5,N=63757
FDC2 X*Xp
ID=20,N=57699
PROY FDC2 X*Xp
ID=19,N=57699
PROX FDC2 X*Xp


2009/05/11 11.04
ID=6,N=56453
FDC3X X*Xp
ID=22,N=56136
PROY FDC3X X*Xp
ID=21,N=56136
PROX FDC3X X*Xp


2009/05/11 11.03
ID=3,N=78765
FDC1X X*Xp
ID=16,N=74633
PROY FDC1X X*Xp
ID=15,N=74633
PROX FDC1X X*Xp


2009/05/11 11.03
ID=4,N=67128
FDC1Y X*Xp
ID=18,N=64681
PROY FDC1Y X*Xp
ID=17,N=64681
PROX FDC1Y X*Xp


2009/05/11 11.04
ID=7,N=61799
FDC3Y X*Xp
ID=24,N=61454
PROY FDC3Y X*Xp
ID=23,N=61454
PROX FDC3Y X*Xp

RUN428 以前の condition と比較するため 同じ condition で データとる。

200k. で 終了.

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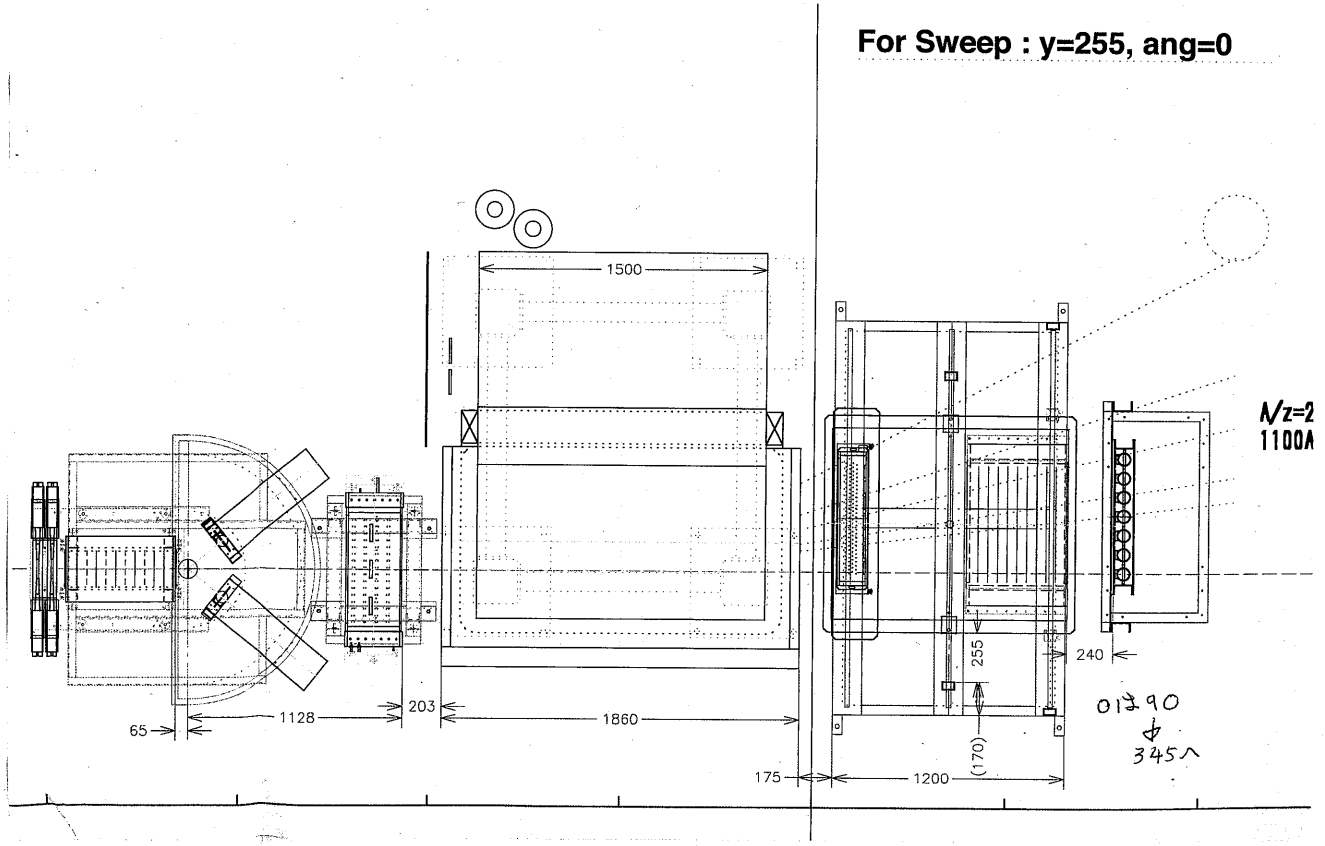
hodo 1~17 あてるために.

平行.

hodo #7 が 0°にくる

ようにした。



1100A　　H1 に当たる　　7 6 5 4 3 2 1

0A　　1100A.

0 A

run 429　0 → 1100

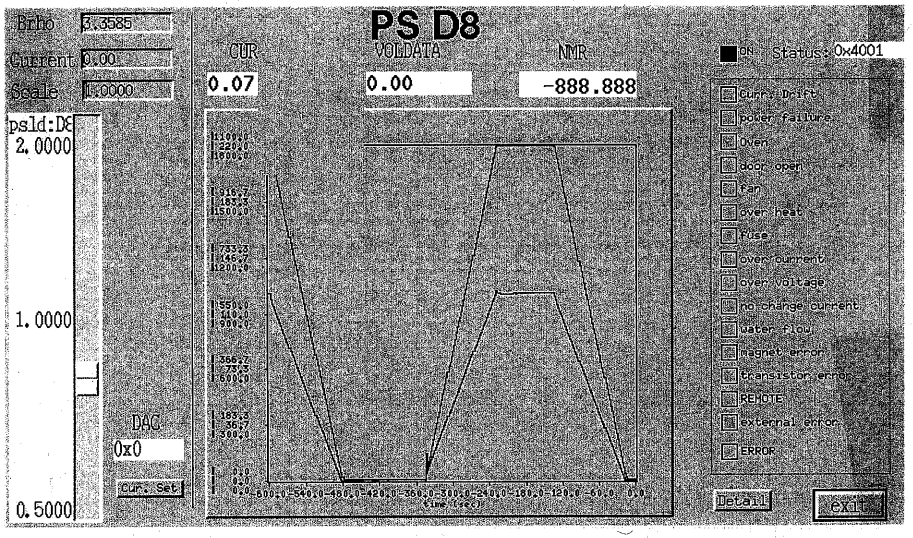
run 430　1100 → 0　　~134k events

1380V−X, 10db

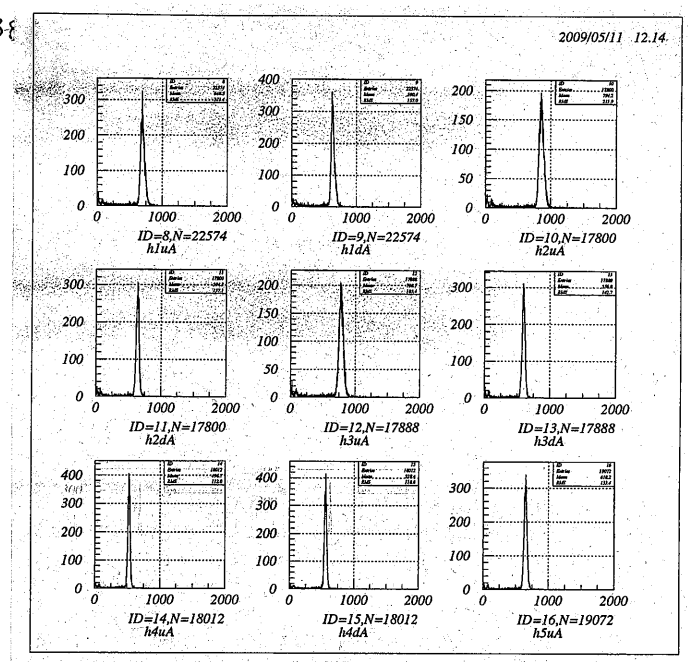
		U	D
H7	analog	200mV	280
6		320	250
5		300	220
4		240	240
3		450	280
2		400	300
1		320	300mV
		↓	↓
		500mV	450mV

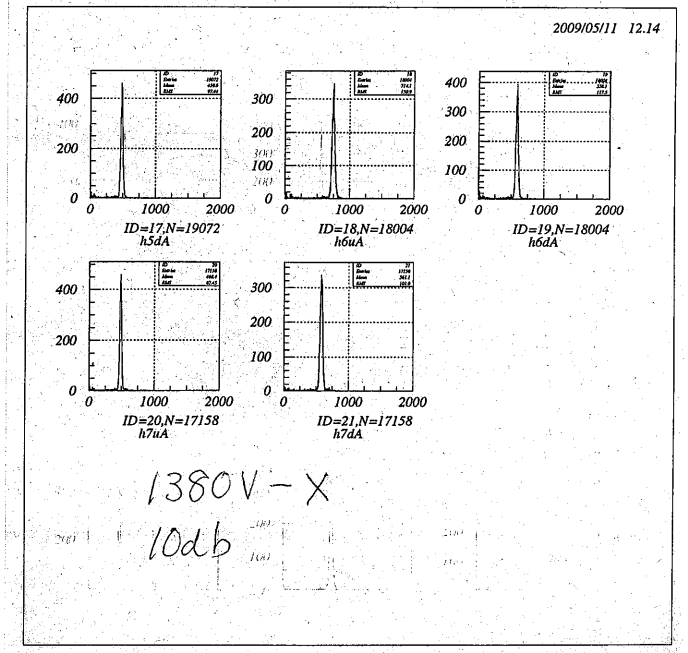
300mV → 1000mV w/o AH

>400mV 少し変形



138





1380V − X

10db

run 429
+
430

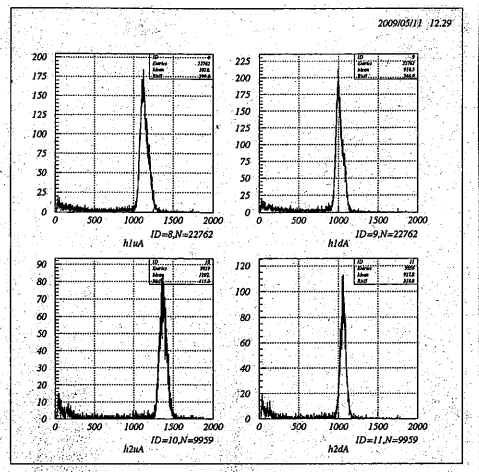
021 1380V → 1300V 変更 12:15

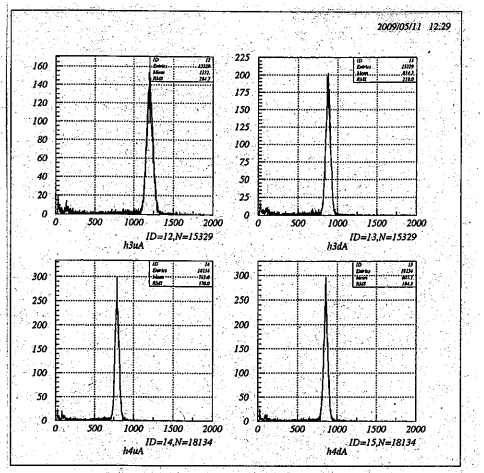
10db Att out

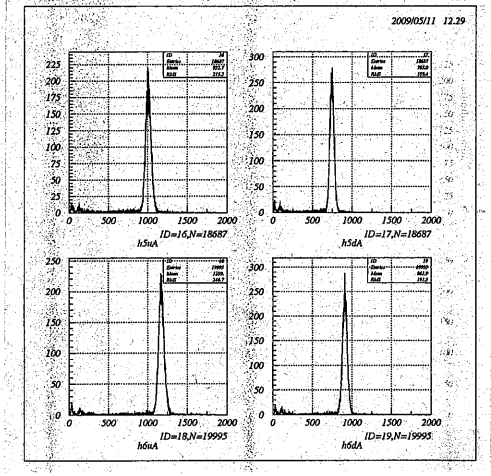
10 0A.

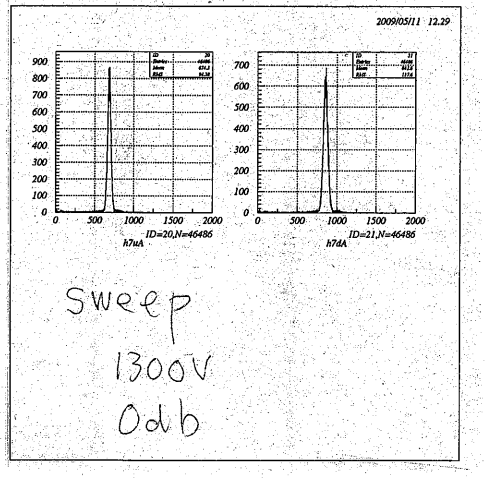
run431, sweep 1100A → 0A

0A → 1100A









sweep
1300V
0db

pedestal 引直す。 旧 → _090511.ped

May 11 2009 12:37 **cont_fera03_090511.ped**

```
 2
 19 0   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 1   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 2   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 3   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 4   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 5   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 6   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 7   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 8   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 9   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 10  0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 11  0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 12  0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 13  0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 14  0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 15  0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 21 0   35.7328796   0.396600157   3. 37   1.1898005   1.26712036
 21 1   35.2544022   0.32713899   3. 37   0.981416941   1.74559784
 21 2   33.4200172   0.304529905   3. 35   0.913589716   1.57998276
 21 3   29.0640221   0.391144693   3. 31   1.17343402   1.93597794
 21 4   40.1871262   0.340558439   3. 42   1.02167535   1.81287384
 21 5   42.928093   0.344035953   3. 44   1.03210783   1.07190704
 21 6   33.100853   0.3403368   3. 35   1.0210104   1.89914703
 21 7   34.5077972   0.225456759   3. 36   0.676370263   1.49220276
 21 8   37.101841   0.326310188   3. 39   0.978930593   1.89815903
 21 9   37.6680145   0.364778578   3. 39   1.09433579   1.33198547
 21 10   31.7222424   0.327458739   3. 33   0.982376218   1.27775764
 21 11   31.1631565   0.33465144   3. 33   1.00395429   1.83684349
 21 12   40.1192513   0.35198465   3. 42   1.05595398   1.88074875
 21 13   29.121788   0.338413596   3. 31   1.01524079   1.87821198
 21 14   35.0376053   0.344226718   3. 37   1.03268015   1.96239471
 21 15   36.4154091   0.289830267   3. 38   0.869490802   1.58459091
```

← 旧 RUN

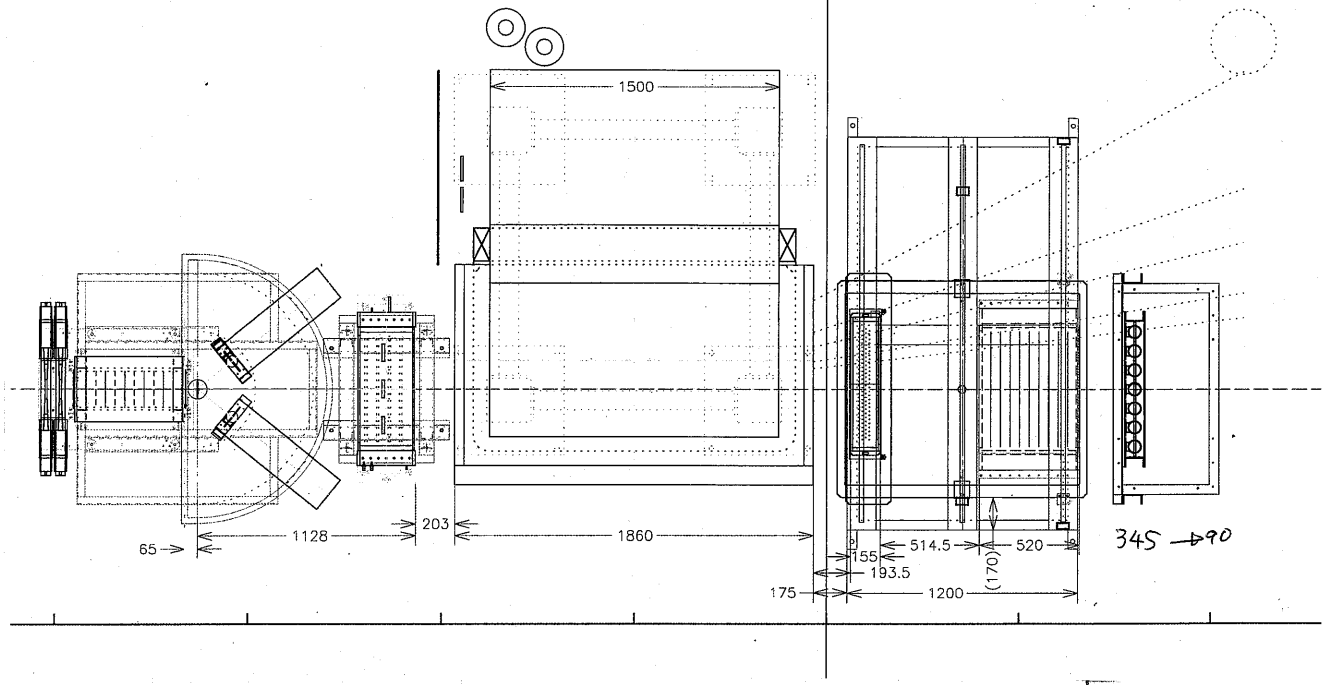
May 11 2009 12:36 **cont_fera03.ped**

```
 2
 19 0   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 1   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 2   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 3   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 4   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 5   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 6   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 7   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 8   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 9   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 10   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 11   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 12   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 13   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 14   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 19 15   0.468797386   0.174932331   3. 1   0.524796963   0.531202614
 21 0   36.6556053   0.828630984   3. 40   2.48589301   3.34439468
 21 1   35.9412079   0.706228673   3. 39   2.11868596   3.05879211
 21 2   34.3365669   0.605941653   3. 37   1.817824496   2.66343307
 21 3   30.8139687   0.687319994   3. 33   2.06195998   2.18603134
 21 4   42.4149017   0.696709037   3. 45   2.09012699   2.58509827
 21 5   38.7812004   0.694911361   3. 41   2.08473396   2.21879959
 21 6   25.4214802   0.523755431   3. 27   1.57126629   1.57851982
 21 7   34.5077972   0.225456759   3. 36   0.676370263   1.49220276
 21 8   38.767952   0.660476267   3. 41   1.98142886   2.23204803
 21 9   44.9009705   0.760515094   3. 48   2.28154516   3.09902954
 21 10   32.7045174   0.527051449   3. 35   1.58115435   2.29548264
 21 11   32.7814445   0.577748179   3. 35   1.73324454   2.21855545
 21 12   40.876606   0.607960701   3. 43   1.8238821   2.12339401
 21 13   33.6035004   0.780741394   3. 36   2.34222412   2.39649963
 21 14   28.9507008   0.919986367   3. 32   2.75995922   3.04929924
 21 15   36.4053345   0.279435664   3. 38   0.838307023   1.59466553
```

← 新

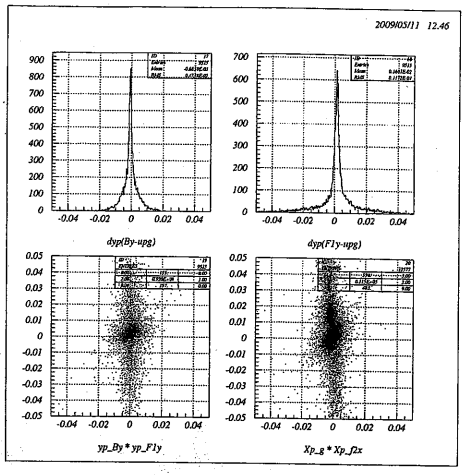
3chくらいずつ違う。

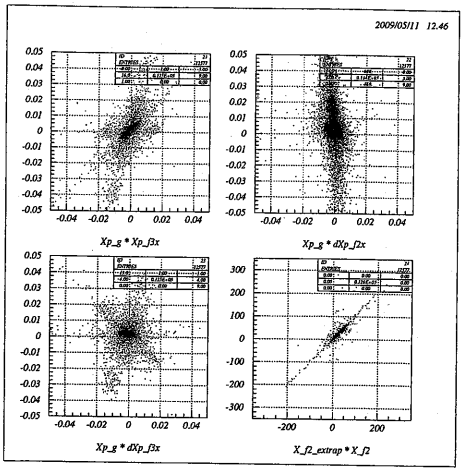
Straight : y=0, ang=0

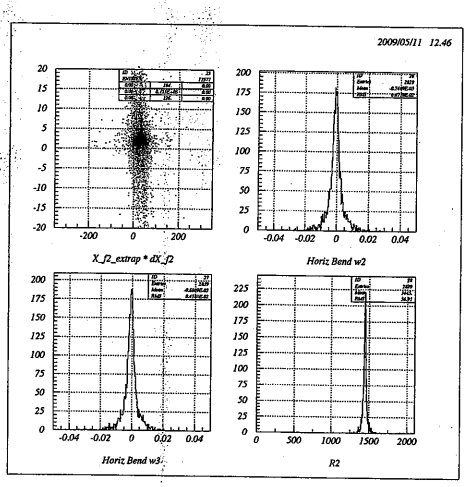


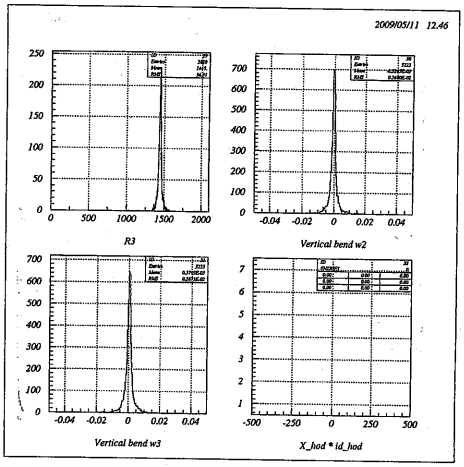
RUN433 0° alignment run.

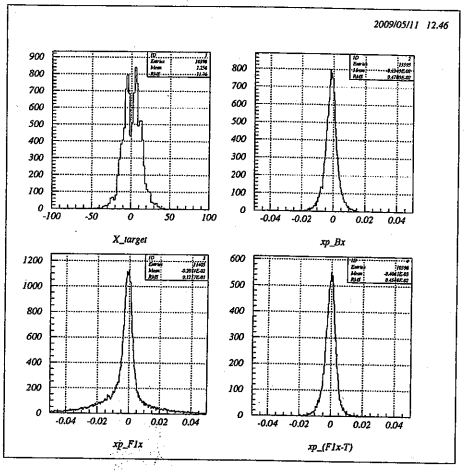
Kappa OA (PS はonaヂ)

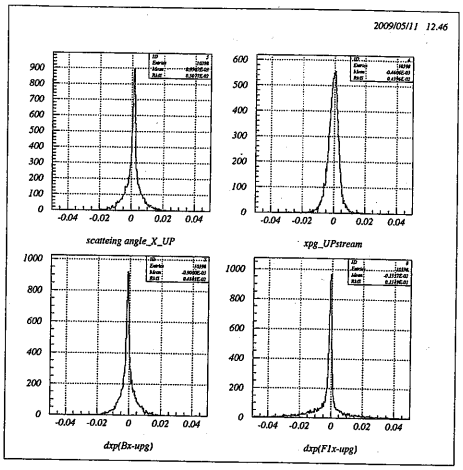

2009/05/11 12.46
dyp(By-upg)
dyp(F1y-upg)
yp_By * yp_F1y
Xp_g * Xp_f2x

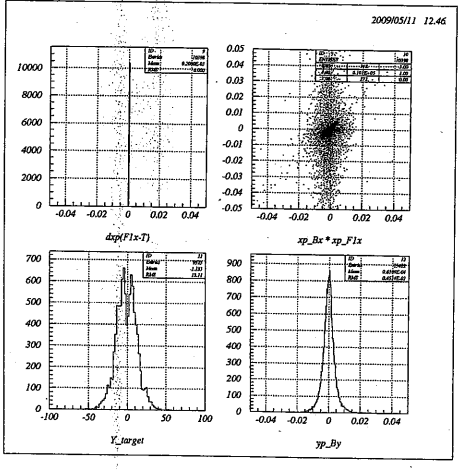

2009/05/11 12.46
Xp_g * Xp_fBx
Xp_g * dXp_f2x
Xp_g * dXp_fBx
X_f2_extrap * X_f2

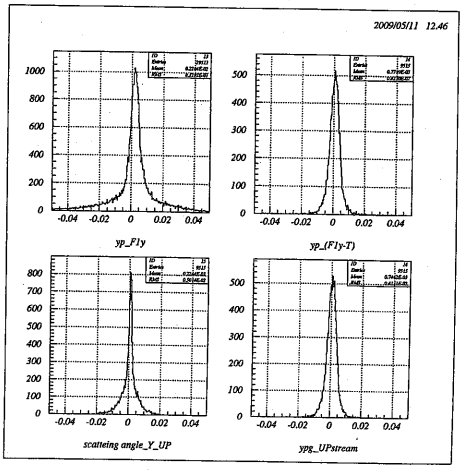

2009/05/11 12.46
X_f2_extrap * dX_f2
Horiz Bend w2
Horiz Bend w3
R2

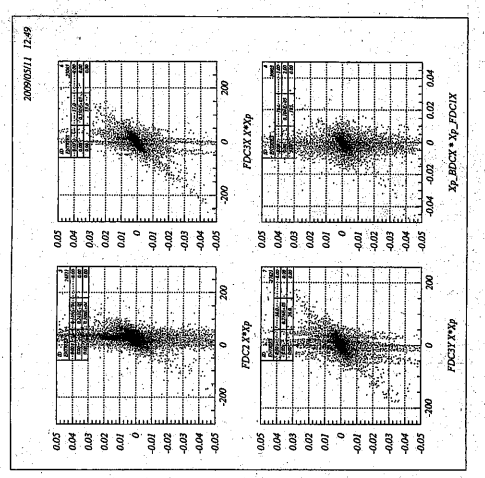

2009/05/11 12.46
R3
Vertical bend w2
Vertical bend w3
X_hod * id_hod

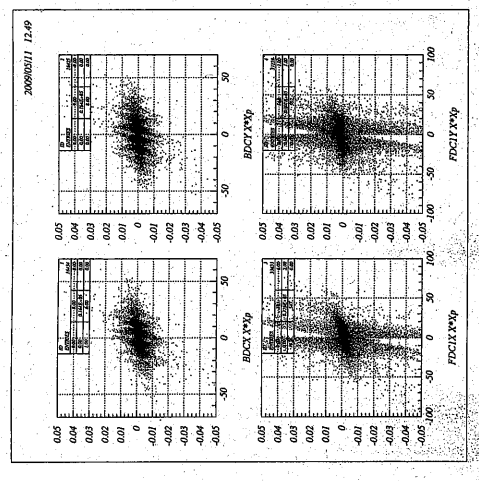

2009/05/11 12.46
X_target
xp_Bx
xp_F1x
xp_(F1x-T)

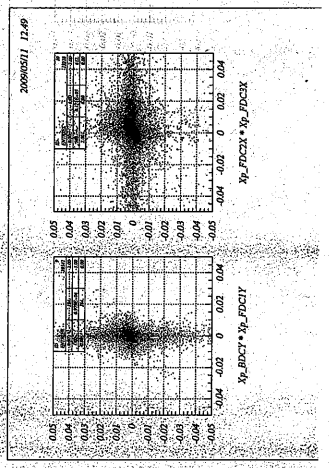

2009/05/11 12.46
scatteing angle_X_UP
xpg_UPstream
dxp(Bx-upg)
dxp(F1x-upg)


2009/05/11 12.46
dxp(F1x-T)
xp_Bx * xp_F1x
Y_target
yp_By


2009/05/11 12.46
yp_F1y
yp_(F1y-T)
scatteing angle_Y_UP
ypg_UPstream

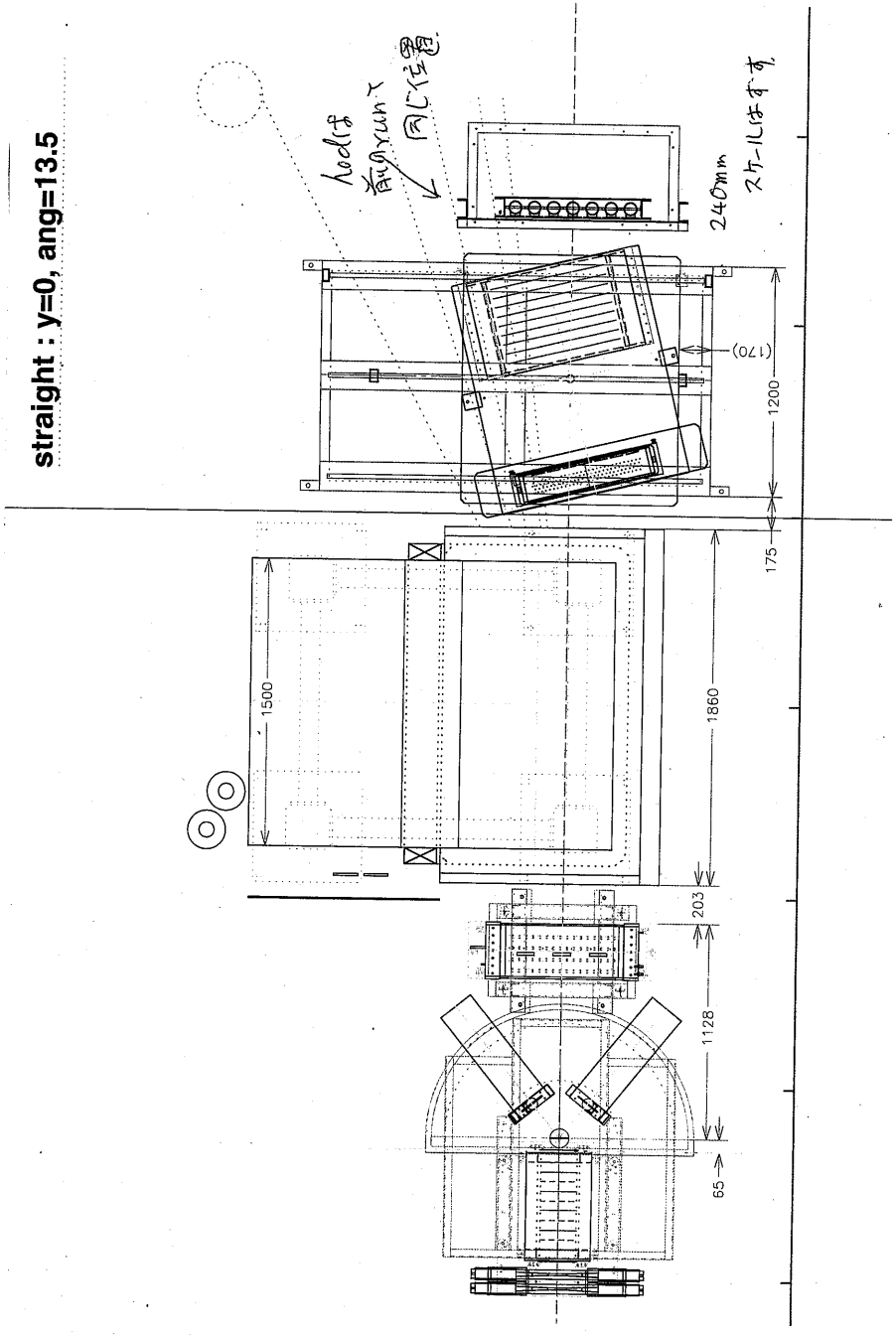






Run# 435 ~(256k) Kappa 0Å

straight : y=0, ang=13.5



13:10 ～ 14:00　見学

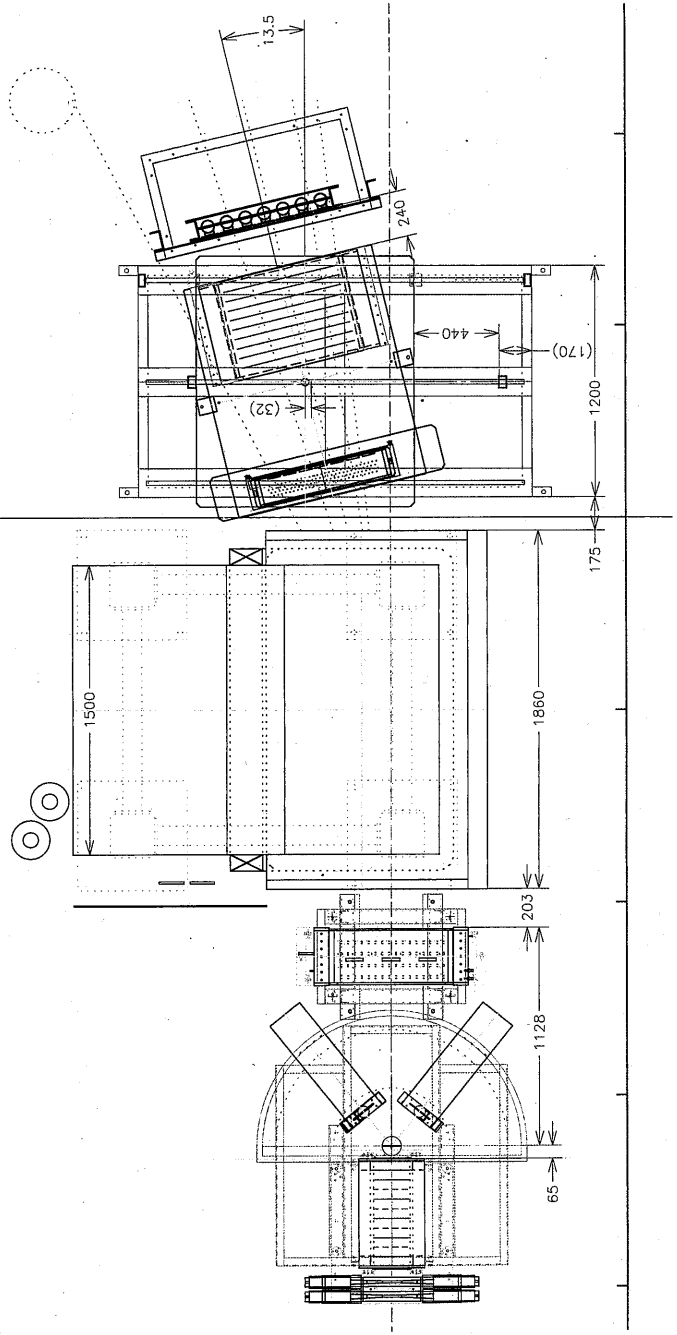
13:55　もどる

FDC2/3/hodを　+440/13.5° へ

2:07
D8　1100Aにset
2:10　1099.66A　122.82V
温度 2:12 33°C
2:15 34°C
14:18　123.11V
アルコール
5.3°C　(123.3V)

14:20　beam reg.
H4に当たる
他は>1ケタ落ち
beam ～ 100Hz.

1100A : y=440, ang=13.5

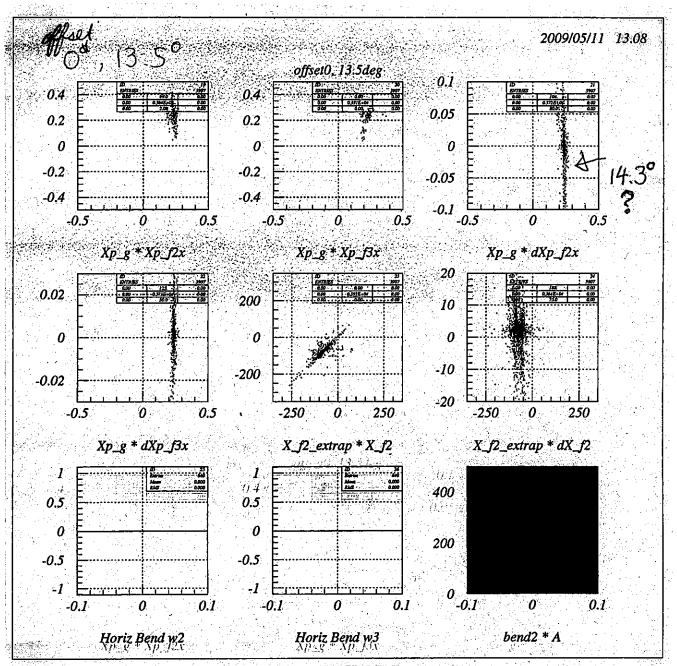


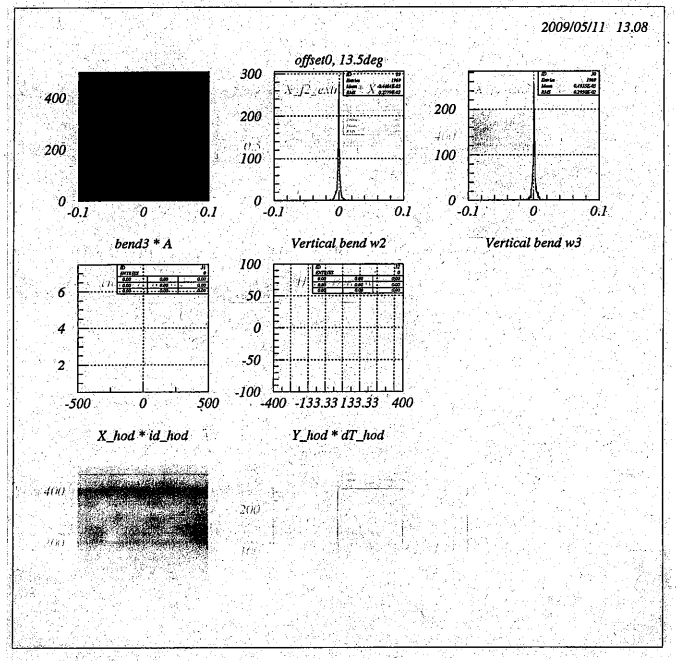
OA

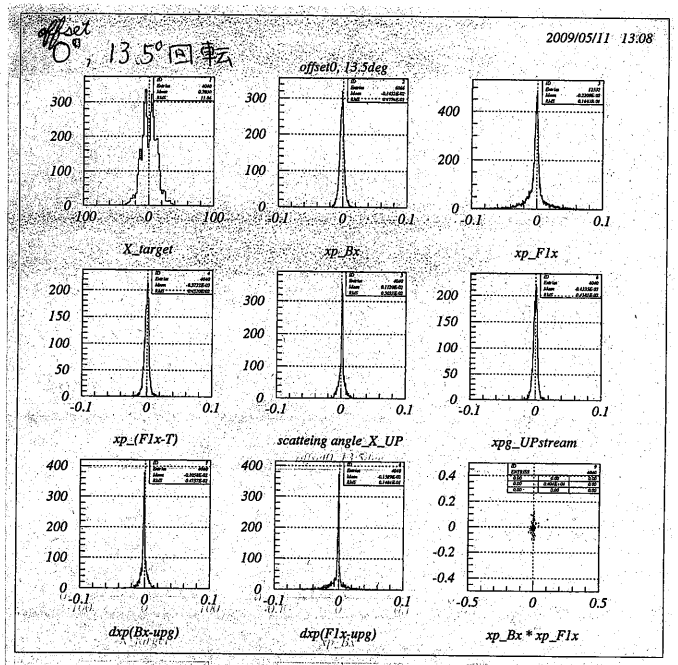
offset=0

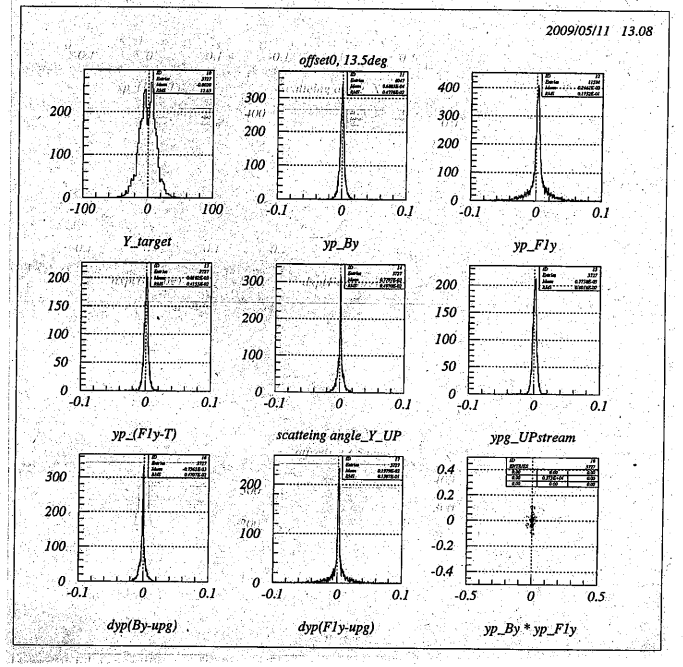
13.5° のrun

← 角度へんこ

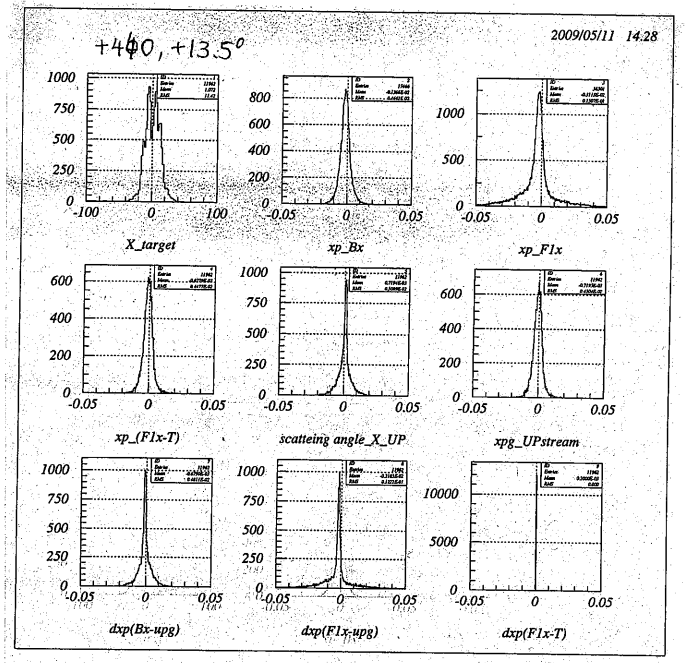


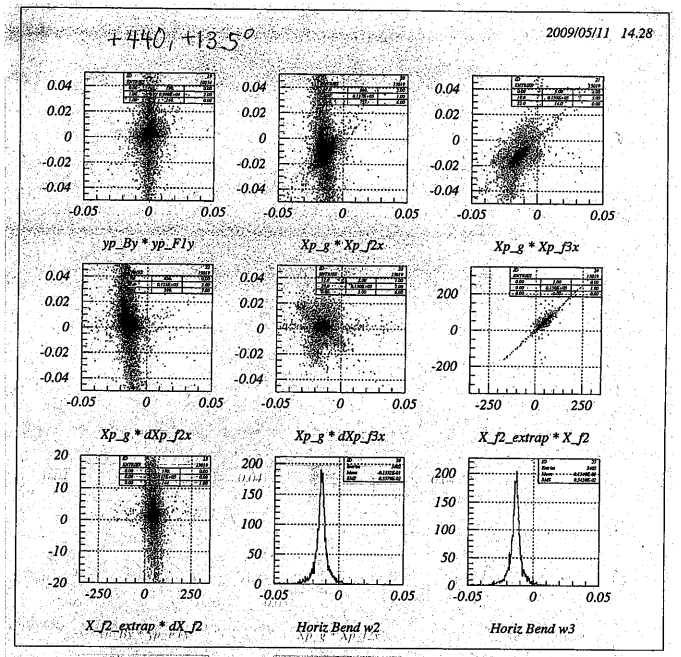


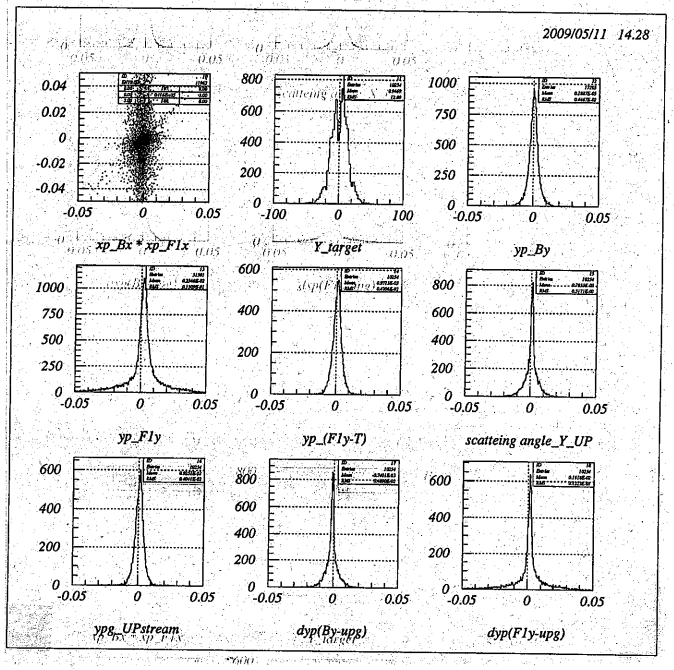


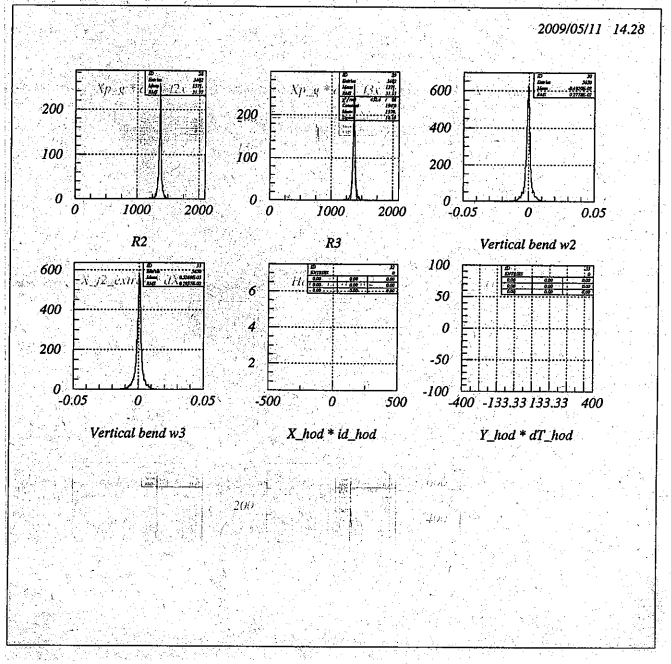


1100A


+440, +13.5°
2009/05/11 14.28
X_target
xp_Bx
xp_F1x
xp_(F1x-T)
scatteing angle_X_UP
xpg_UPstream
dxp(Bx-upg)
dxp(F1x-upg)
dxp(F1x-T)


+440, +13.5°
2009/05/11 14.28
yp_By * yp_F1y
Xp_g * Xp_f2x
Xp_g * Xp_f3x
Xp_g * dXp_f2x
Xp_g * dXp_f3x
X_f2_extrap * X_f2
X_f2_extrap * dX_f2
Horiz Bend w2
Horiz Bend w3


2009/05/11 14.28
xp_Bx * xp_F1x
Y_target
yp_By
yp_F1y
yp_(F1y-T)
scatteing angle_Y_UP
ypg_UPstream
dyp(By-upg)
dyp(F1y-upg)


2009/05/11 14.28
R2
R3
Vertical bend w2
Vertical bend w3
X_hod * id_hod
Y_hod * dT_hod

14:40 CH_2 Target IN ~~5~~ 4 mm 19.6 deg / 440

Run437 5/11 14:50 ~
(250k) beam ~1KHz

CH_2 Target is changed to 4 mm. I = 1100 (same as before)

Run 438 * コメントがペーストできなかったので stop に入れました。

15:22 CH_2 6+10 mm (1mm × 6 + 10 mm)

Run 439 (250k)

→ Target の前に 保護用の カバーが 残っていたことに気がついて. 同じ 6+10mmを もう一度.

Run 440 1mm × 6 + 10 mm 439と 同じ

15:45 CH_2 Target = 4 mm Trigger (ΔEL * ΔER)

ΔEL/R ±39°

bear 70/40K @1kHz ↓ 50K ≈40KHz 2Hz trig ~55Hz

Run 441 15:59 ~

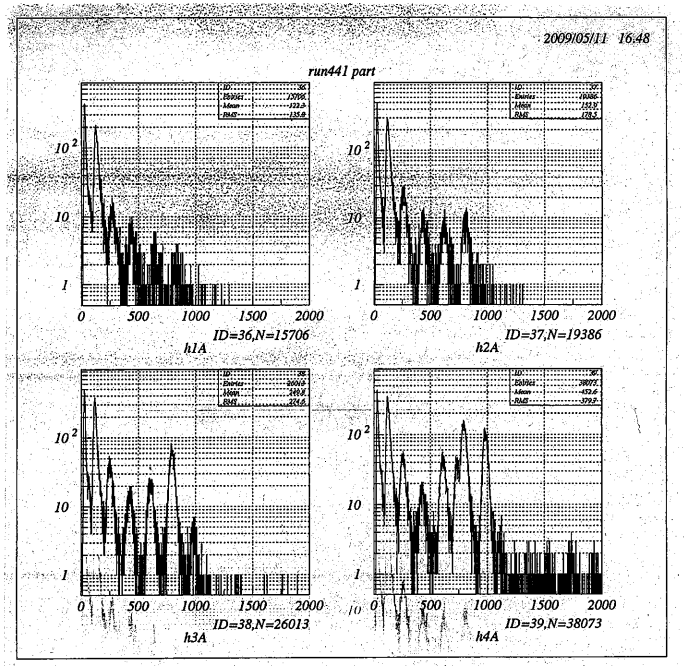
beam 強度; by operator ion-source - AVF 間
IH-10C $\frac{1}{100}$ 抜き
C22 $\frac{1}{1.8}$ 入れ.

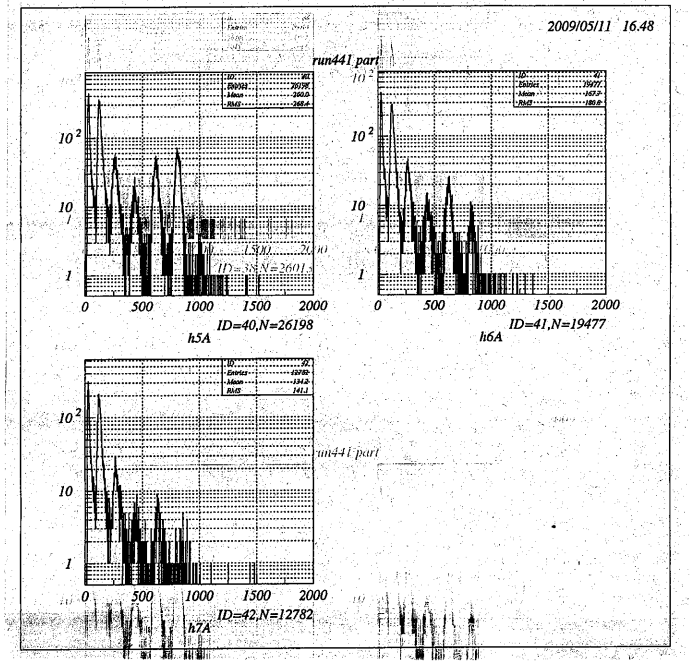
~40 KHz
BDC ~300nA
FDC1 180nA
FDC2 120nA
FDC3 150nA

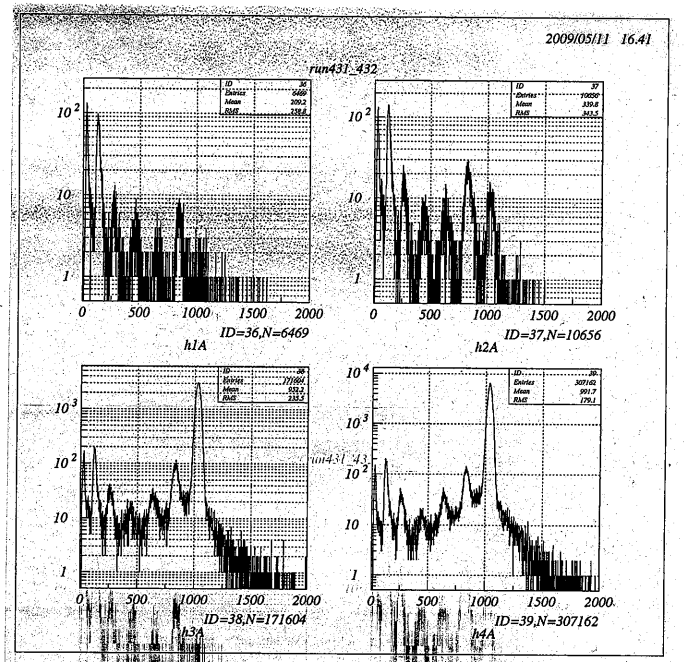
beam カレント 多くなって 80kHzくらい

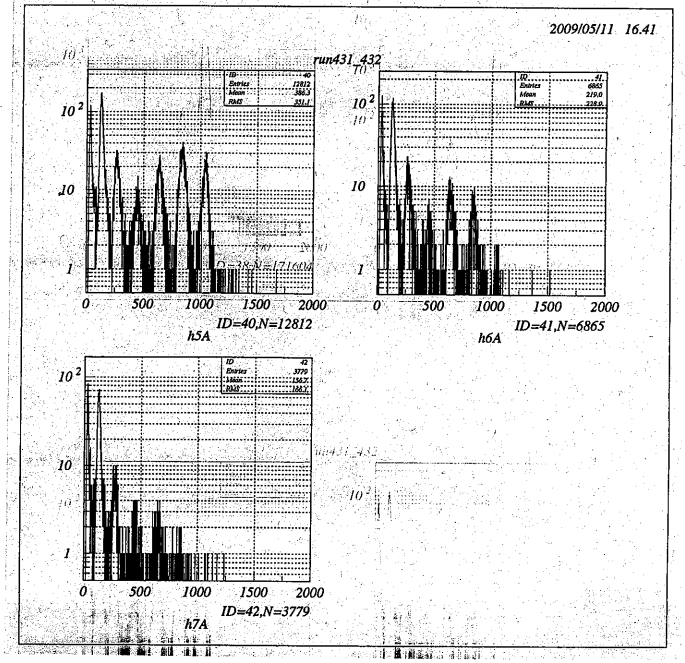
1度 RON にプって

RON 442.


2009/05/11 16:48
run441 part
ID=36,N=15706
h1A
ID=37,N=19386
h2A
ID=38,N=26013
h3A
ID=39,N=38073
h4A

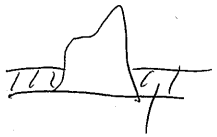

2009/05/11 16:48
run441 part
ID=40,N=26198
h5A
ID=41,N=19477
h6A
ID=42,N=12782
h7A


2009/05/11 16:41
run431_432
ID=36,N=6469
h1A
ID=37,N=10656
h2A
ID=38,N=171604
h3A
ID=39,N=307162
h4A


2009/05/11 16:41
run431_432
ID=40,N=12812
h5A
ID=41,N=6865
h6A
ID=42,N=3779
h7A

BDC 0.5μA
FDC1 0.3μA
2 0.25μA
3 0.3μA

~80kHz
DC TDC

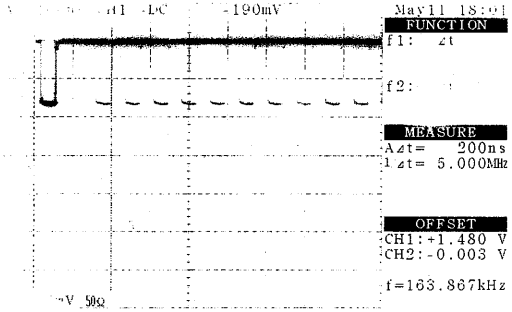


この条件で hardware buffer が overflow し、effが悪くなる？

r443
160kHz beamtrig

160kHz
BDC 1.3μ
1 0.8μ
2 0.5μ
3 0.8μ

r444
160kHz reactiontrig.



Beam 10kHz Reaction Trigger Trigger Rate 18Hz
Run 445 17:50~

BDC 0.1μA
FDC1 60nA
FDC2 60nA
FDC3 50nA

run445 途中
beam=10KHz
trig=Beam*(dE1*dER) about 17Hz

run445

Name	Sum(M)	M1	M2	M3	M4	M5+	MW1	MW2	MW3	MW4+	MC1	MC2	MC3	MC4+	:Tot/Ana :
13213	13213														
BDCx1	73.59	53.88	14.96	3.75	0.74	0.26	59.15	12.77	1.51	0.17	63.22	9.08	1.20	0.10	
BDCx2	78.23	55.16	17.39	4.16	1.19	0.33	60.12	15.54	2.27	0.30	66.56	10.32	1.19	0.16	
BDCx3	82.62	56.32	19.21	5.35	1.33	0.42	61.36	18.01	2.88	0.37	69.27	11.59	1.54	0.22	
BDCx4	84.66	57.85	19.62	5.44	1.41	0.33	63.07	18.60	2.65	0.34	71.13	11.73	1.63	0.17	
BDCx5	88.11	58.09	21.37	6.52	1.68	0.45	63.44	20.46	3.77	0.45	71.96	14.12	1.82	0.21	
BDCy1	78.48	53.95	17.71	5.15	1.27	0.40	58.87	16.65	2.63	0.32	66.56	10.29	1.45	0.17	
BDCy2	82.67	56.71	18.85	5.31	1.35	0.44	62.04	17.61	2.70	0.31	69.91	11.15	1.42	0.20	
BDCy3	85.29	58.12	19.88	5.61	1.29	0.39	63.21	18.94	2.75	0.39	72.41	11.30	1.41	0.17	
BDCy4	86.09	59.65	19.39	5.33	1.32	0.39	65.11	18.05	2.61	0.32	73.25	11.17	1.49	0.18	
BDCy5	84.82	61.01	18.29	4.34	0.95	0.23	67.01	15.83	1.81	0.17	72.41	10.85	1.36	0.19	
FDC1x1	41.01	32.88	6.89	1.04	0.15	0.05	36.21	4.46	0.33	0.02	35.03	5.41	0.53	0.05	
FDC1x2	42.71	33.39	7.53	1.51	0.22	0.06	37.26	5.15	0.28	0.02	36.30	5.63	0.67	0.11	
FDC1x3	39.93	32.51	6.12	1.16	0.13	0.01	35.06	4.49	0.37	0.01	34.60	4.72	0.56	0.05	
FDC1x4	44.76	35.19	7.91	1.38	0.23	0.05	39.31	5.04	0.40	0.01	37.61	6.27	0.79	0.09	
FDC1y1	44.86	35.32	7.67	1.43	0.36	0.08	39.20	5.35	0.30	0.00	39.70	4.62	0.49	0.04	
FDC1y2	54.58	40.06	11.49	2.28	0.55	0.20	45.03	8.78	0.74	0.03	45.81	7.72	0.92	0.14	
FDC1y3	55.75	40.19	12.00	2.85	0.52	0.19	45.47	9.30	0.92	0.06	45.86	8.58	1.18	0.13	
FDC1y4	37.72	30.67	6.01	0.88	0.13	0.03	34.00	3.57	0.14	0.00	33.44	3.88	0.37	0.03	
FDC2x1	27.11	22.14	4.09	0.69	0.15	0.03	23.68	3.05	0.36	0.02	23.51	3.19	0.36	0.05	
FDC2x2	28.20	22.64	4.64	0.73	0.16	0.03	24.35	3.44	0.38	0.03	24.17	3.59	0.36	0.08	
FDC2x3	28.63	22.93	4.62	0.86	0.19	0.03	24.65	3.48	0.47	0.03	24.40	3.75	0.41	0.07	
FDC2x4	29.24	23.20	4.93	0.86	0.17	0.07	24.79	3.91	0.50	0.04	24.96	3.77	0.42	0.09	
FDC3x1	29.58	23.99	4.50	0.89	0.14	0.05	25.53	3.59	0.40	0.05	25.84	3.42	0.28	0.04	
FDC3x2	31.14	24.57	5.39	0.98	0.14	0.06	26.11	4.48	0.49	0.05	26.85	3.81	0.40	0.07	
FDC3x3	29.76	23.86	4.86	0.86	0.14	0.05	25.37	3.83	0.52	0.04	25.77	3.63	0.33	0.04	
FDC3x4	29.45	23.61	4.67	0.96											
FDC3x5	28.37	23.12	4.29	0.80											
FDC3y1	31.16	24.85	5.03	1.07											
FDC3y2	29.55	23.95	4.43	0.98											
FDC3y3	29.23	23.41	4.84	0.77											
FDC3y4	30.46	24.45	4.88	0.88											

やはり低い。

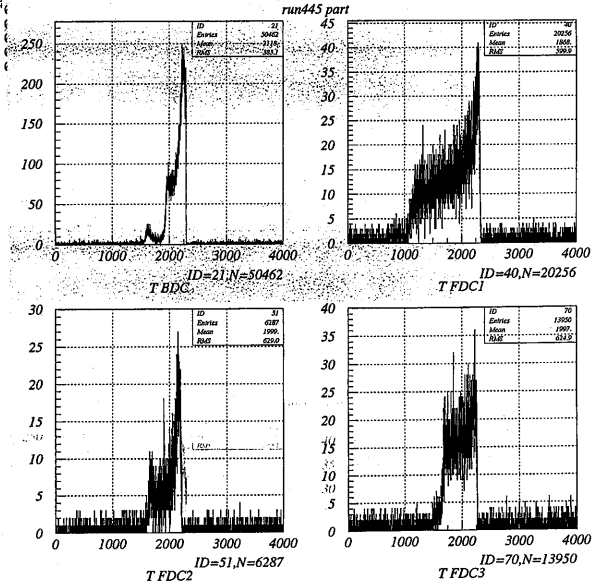
ratioはそこまで悪くない

10KHz

※P42は 40~80kHz
同じtrig. run441

FDC2,3のefficiencyが低い。

run445 part



HEADER: Run title:
RUN-0437 START => 14:50:17 STOP => 14:57:47 PRINT => xx:xx:xx May 11 2009
CH2-4mm, 13.5deg/440

1kHz

#Events : 252389
Next Raw Data File ? [y/n: n] > Name : Sum(M) M1 M2 M3 M4 M5+ MW1 MW2 MW3 MW4+
MC1 MC2 MC3 MC4+ :Tot/Ana : 252389 252389

BDCx1	:	98.67	78.05	17.07	3.04	0.44	0.06	84.27	13.42	0.94	0.04	88.13	9.44	1.02	0.09
BDCx2	:	98.99	74.99	19.19	3.98	0.70	0.13	80.67	16.64	1.57	0.11	87.89	9.90	1.09	0.10
BDCx3	:	99.19	73.31	20.40	4.47	0.84	0.16	78.61	18.48	1.95	0.15	87.74	10.25	1.10	0.10
BDCx4	:	99.26	73.90	19.97	4.44	0.79	0.15	79.32	17.99	1.81	0.14	87.95	10.08	1.13	0.11
BDCx5	:	99.45	72.21	21.21	4.87	0.95	0.20	77.52	19.49	2.25	0.18	87.15	10.94	1.23	0.13
BDCy1	:	99.04	73.91	19.78	4.39	0.81	0.14	79.26	17.84	1.80	0.13	87.92	9.88	1.13	0.11
BDCy2	:	99.19	73.07	20.37	4.69	0.88	0.18	78.39	18.64	2.01	0.15	87.89	10.06	1.12	0.12
BDCy3	:	99.26	73.37	20.30	4.59	0.83	0.17	78.47	18.60	2.03	0.15	87.89	10.16	1.09	0.11
BDCy4	:	99.26	73.69	20.10	4.50	0.82	0.15	79.64	17.69	1.81	0.12	87.40	10.48	1.25	0.13
BDCy5	:	99.12	77.34	17.95	3.29	0.47	0.08	83.50	14.46	1.10	0.06	88.08	9.86	1.09	0.09
FDC1x1	:	97.72	82.99	12.93	1.61	0.17	0.02	90.99	6.54	0.18	0.01	87.92	9.00	0.74	0.06
FDC1x2	:	97.86	75.31	18.79	3.28	0.42	0.06	88.46	9.22	0.18	0.00	82.69	13.57	1.48	0.13
FDC1x3	:	96.18	81.52	12.82	1.65	0.17	0.02	89.01	6.93	0.23	0.01	86.88	8.30	0.90	0.09
FDC1x4	:	97.94	80.33	15.09	2.19	0.28	0.04	90.95	6.80	0.17	0.01	85.78	11.00	1.06	0.09
FDC1y1	:	97.91	79.24	15.98	2.40	0.27	0.03	88.28	9.39	0.25	0.00	87.74	9.43	0.71	0.04
FDC1y2	:	98.33	70.60	22.02	4.74	0.82	0.15	83.30	14.19	0.82	0.02	81.61	14.73	1.80	0.19
FDC1y3	:	98.41	70.37	22.00	4.95	0.90	0.18	82.87	14.52	0.98	0.03	81.44	14.86	1.89	0.21
FDC1y4	:	97.59	81.76	13.99	1.66	0.16	0.01	90.55	6.89	0.15	0.00	87.79	9.17	0.60	0.03
FDC2x1	:	94.65	78.12	14.38	1.92	0.20	0.02	84.76	9.34	0.52	0.03	83.89	9.83	0.87	0.06
FDC2x2	:	95.08	77.13	15.55	2.13	0.24	0.03	84.32	10.12	0.61	0.04	83.03	11.01	0.98	0.07
FDC2x3	:	95.26	76.29	16.32	2.35	0.27	0.03	83.74	10.80	0.67	0.04	82.72	11.44	1.02	0.08
FDC2x4	:	95.49	74.82	17.42	2.84	0.36	0.05	82.71	11.89	0.84	0.05	82.06	12.10	1.24	0.10
FDC3x1	:	97.01	79.60	15.15	2.00	0.22	0.03	85.05	11.29	0.64	0.03	87.64	8.75	0.59	0.03
FDC3x2	:	97.03	77.63	16.44	2.57	0.34	0.05	83.02	13.01	0.94	0.06	86.11	10.05	0.81	0.06
FDC3x3	:	97.02	78.54	15.85	2.29	0.29	0.05	83.92	12.22	0.84	0.04	86.31	9.89	0.77	0.05
FDC3x4	:	96.99	77.98	16.26	2.41	0.30	0.05	83.38	12.68	0.88	0.06	86.23	9.93	0.78	0.05
FDC3x5	:	96.86	79.41	15.11	2.07	0.24	0.03	84.63	11.46	0.73	0.04	86.77	9.34	0.71	0.05
FDC3y1	:	97.15	77.21	16.92	2.63	0.35	0.06	82.81	13.35	0.94	0.06	86.39	9.92	0.80	0.05
FDC3y2	:	96.98	78.22	16.07	2.36	0.29	0.05	83.72	12.39	0.82	0.05	86.56	9.66	0.72	0.04
FDC3y3	:	96.95	78.30	15.95	2.34	0.31	0.05	83.77	12.32	0.80	0.05	86.59	9.56	0.75	0.05
FDC3y4	:	97.06	76.57	17.27	2.77	0.38	0.07	82.19	13.75	1.05	0.07	85.50	10.58	0.91	0.06

HEADER: Run title:
RUN-0441 START => 15:59:55 STOP => 16:45:23 PRINT => xx:xx:xx May 11 2009
Intensity was increased during this run

40 ~ 80 kHz. reac. trig

#Events : 210282
Next Raw Data File ? [y/n: n] > Name : Sum(M) M1 M2 M3 M4 M5+ MW1 MW2 MW3 MW4+ MC1
MC2 MC3 MC4+ :Tot/Ana : 210282 210282

BDCx1	:	80.92	43.36	22.24	9.64	3.74	1.94	52.29	22.79	5.07	0.77	60.97	15.87	3.36	0.72
BDCx2	:	84.37	43.44	23.40	10.63	4.38	2.51	52.22	24.63	6.36	1.16	62.24	17.58	3.72	0.84
BDCx3	:	87.53	43.46	24.58	11.62	4.83	3.03	51.36	27.07	7.59	1.52	64.17	18.49	4.01	0.87
BDCx4	:	88.92	44.20	25.22	11.69	4.90	2.92	52.79	27.25	7.45	1.43	64.85	19.14	4.04	0.89
BDCx5	:	91.49	44.02	26.22	12.51	5.40	3.33	52.17	29.12	8.40	1.79	66.39	19.87	4.29	0.94
BDCy1	:	84.48	43.06	23.34	10.97	4.43	2.68	50.55	25.33	7.19	1.40	63.39	16.87	3.47	0.76
BDCy2	:	87.35	43.60	24.43	11.57	4.78	2.97	51.45	26.71	7.67	1.52	65.14	17.76	3.65	0.80
BDCy3	:	89.17	44.36	25.03	11.72	4.99	3.07	52.09	27.42	8.01	1.65	66.47	18.13	3.77	0.79
BDCy4	:	89.94	44.81	25.28	11.84	4.95	3.05	53.47	27.34	7.65	1.48	66.76	18.34	3.96	0.88
BDCy5	:	88.76	46.61	24.77	10.80	4.29	2.28	55.71	25.65	6.40	1.00	66.74	17.63	3.63	0.75
FDC1x1	:	58.08	35.77	15.20	5.07	1.52	0.52	45.99	10.85	1.16	0.08	41.53	12.68	3.09	0.79
FDC1x2	:	59.64	34.66	15.67	6.16	2.19	0.96	42.90	14.94	1.71	0.09	44.24	12.27	2.56	0.58
FDC1x3	:	57.25	35.03	14.84	5.21	1.60	0.58	41.72	13.42	1.95	0.16	43.32	11.27	2.20	0.45
FDC1x4	:	60.71	36.12	16.17	5.95	1.80	0.68	46.63	12.51	1.48	0.09	42.57	13.64	3.54	0.95
FDC1y1	:	61.30	36.14	16.23	6.13	2.00	0.81	46.77	13.26	1.27	0.01	47.15	11.28	2.37	0.50
FDC1y2	:	68.23	36.60	18.36	8.16	3.30	1.81	44.94	19.25	3.77	0.27	50.98	13.65	2.94	0.67
FDC1y3	:	68.83	36.43	18.72	8.39	3.40	1.90	44.63	19.69	4.18	0.33	50.97	14.04	3.11	0.70
FDC1y4	:	56.25	34.67	14.47	5.06	1.51	0.54	45.36	10.11	0.76	0.02	42.06	10.99	2.61	0.60
FDC2x1	:	47.25	29.53	11.76	4.09	1.31	0.55	33.07	11.16	2.54	0.48	34.77	9.96	2.08	0.44
FDC2x2	:	48.22	29.47	12.23	4.51	1.44	0.58	33.07	11.71	2.90	0.56	34.83	10.57	2.35	0.48
FDC2x3	:	48.57	29.50	12.41	4.48	1.55	0.64	33.16	11.89	2.92	0.61	34.90	10.75	2.39	0.53
FDC2x4	:	49.18	29.17	12.68	4.91	1.68	0.75	32.93	12.35	3.22	0.68	34.90	11.07	2.65	0.57
FDC3x1	:	49.32	30.13	12.52	4.57	1.50	0.60	34.21	12.32	2.46	0.32	37.55	9.64	1.80	0.32
FDC3x2	:	50.52	30.26	12.77	5.00	1.70	0.80	34.49	12.54	2.98	0.51	36.98	10.62	2.39	0.53
FDC3x3	:	49.75	30.26	12.44	4.76	1.60	0.69	34.39	12.13	2.79	0.45	37.09	10.10	2.12	0.44
FDC3x4	:	48.82	29.79	12.29	4.61	1.47	0.68	33.86	11.94	2.62	0.41	36.56	9.83	2.03	0.40
FDC3x5	:	48.82	29.79	12.29	4.61	1.47	0.68	33.86	11.94	2.62	0.41	36.56	9.83	2.03	0.40
FDC3y1	:	50.89	30.21	13.06	5.05	1.73	0.83	34.48	13.14	2.84	0.43	38.49	10.07	1.94	0.38
FDC3y2	:	49.61	30.08	12.59	4.72	1.56	0.66	34.71	12.09	2.45	0.35	37.50	9.78	1.93	0.39
FDC3y3	:	49.32	30.00	12.48	4.63	1.52	0.69	34.60	11.92	2.46	0.35	37.38	9.67	1.90	0.38
FDC3y4	:	50.41	30.08	12.77	5.00	1.74	0.82	34.23	12.76	2.95	0.47	37.82	10.15	2.05	0.39

Name		Sum(M)	M1	M2	M3	M4	M5+	MW1	MW2	MW3	MW4+	MC1	MC2	MC3	MC4+	:Tot/
8545 8545																
BDCx1	:	98.71	74.65	18.97	4.15	0.78	0.15	81.92	15.35	1.31	0.13	86.72	10.53	1.30	0.16	
BDCx2	:	99.06	72.69	20.62	4.46	1.01	0.29	79.12	17.83	1.93	0.18	86.82	10.91	1.15	0.19	
BDCx3	:	99.18	70.83	21.69	5.15	1.23	0.29	76.93	19.56	2.41	0.28	86.42	11.32	1.28	0.16	
BDCx4	:	99.26	71.98	21.25	4.84	0.95	0.23	77.59	19.37	2.19	0.12	87.09	10.80	1.28	0.09	
BDCx5	:	99.49	69.77	22.15	5.83	1.36	0.37	75.85	20.35	3.01	0.28	85.43	12.45	1.45	0.15	
BDCy1	:	99.05	72.09	20.69	4.97	1.10	0.20	78.21	18.36	2.26	0.22	86.38	11.07	1.47	0.13	
BDCy2	:	99.19	70.72	21.38	5.52	1.29	0.28	76.78	19.57	2.50	0.34	86.14	11.67	1.25	0.13	
BDCy3	:	99.34	71.47	20.98	5.55	1.05	0.29	76.98	19.43	2.70	0.23	86.59	11.15	1.51	0.09	
BDCy4	:	99.29	71.50	20.92	5.38	1.25	0.22	77.74	18.76	2.59	0.20	85.82	12.05	1.25	0.16	
BDCy5	:	99.16	75.78	18.91	3.64	0.68	0.15	82.31	15.32	1.43	0.11	87.43	10.49	1.08	0.16	
FDC1x1	:	97.98	80.66	15.05	2.09	0.16	0.01	90.83	6.89	0.26	0.00	85.66	11.23	1.01	0.07	
FDC1x2	:	97.82	73.39	20.16	3.58	0.59	0.11	87.27	10.35	0.21	0.00	81.59	14.53	1.53	0.16	
FDC1x3	:	96.33	80.15	14.29	1.63	0.23	0.02	88.38	7.74	0.21	0.00	86.39	9.14	0.71	0.08	
FDC1x4	:	97.92	78.65	16.03	2.84	0.32	0.07	90.91	6.78	0.22	0.01	83.99	12.31	1.47	0.14	
FDC1y1	:	97.93	76.31	17.74	3.34	0.46	0.08	87.41	10.24	0.28	0.00	85.49	11.19	1.17	0.08	
FDC1y2	:	98.28	69.39	23.05	4.51	1.02	0.32	82.20	15.26	0.82	0.00	81.60	14.72	1.77	0.19	
FDC1y3	:	98.34	69.12	22.39	5.36	1.25	0.22	81.51	15.62	1.19	0.01	81.24	14.85	1.99	0.26	
FDC1y4	:	97.61	78.88	15.99	2.41	0.33	0.01	89.84	7.51	0.26	0.00	85.20	11.36	0.99	0.06	
FDC2x1	:	94.79	75.65	16.00	2.74	0.33	0.08	82.62	11.26	0.87	0.05	82.56	10.90	1.21	0.13	
FDC2x2	:	95.17	74.93	16.76	3.00	0.40	0.08	82.41	11.68	0.99	0.08	81.63	12.09	1.35	0.11	
FDC2x3	:	95.39	74.09	17.66	3.08	0.46	0.11	82.02	12.17	1.10	0.09	80.95	12.98	1.35	0.12	
FDC2x4	:	95.46	72.43	18.76	3.72	0.50	0.05	80.81	13.46	1.12	0.07	80.48	13.15	1.67	0.15	
FDC3x1	:	96.93	76.92	16.84	2.74	0.37	0.06	83.24	12.78	0.83	0.08	86.23	9.88	0.76	0.07	
FDC3x2	:	96.98	75.96	16.97	3.41	0.57	0.07	81.70	13.97	1.21	0.11	85.64	10.15	1.10	0.09	
FDC3x3	:	97.05	76.34	17.52	2.74	0.39	0.07	82.82	13.21	0.99	0.02	85.10	10.91	0.98	0.06	
FDC3x4	:	96.95	75.76	17.65	2.90	0.54	0.09	82.27	13.55	1.01	0.12	84.41	11.56	0.84	0.13	
FDC3x5	:	96.86	76.75	16.97	2.64	0.44	0.06	83.07	12.85	0.87	0.08	85.03	10.85	0.90	0.08	
FDC3y1	:	97.20	74.38	18.29	3.71	0.62	0.20	80.14	15.61	1.35	0.11	85.32	10.64	1.10	0.14	
FDC3y2	:	97.04	75.89	17.78	2.95	0.30	0.12	82.52	13.49	0.94	0.09	85.39	10.78	0.82	0.05	
FDC3y3	:	97.05	76.09	17.24	3.10	0.51	0.11	82.24	13.59	1.19	0.04	85.37	10.64	0.95	0.09	
FDC3y4	:	96.98	74.11	18.81	3.30	0.64	0.12	80.26	15.37	1.26	0.09	84.73	11.02	1.14	0.09	

未設定 /.txt 09/05/

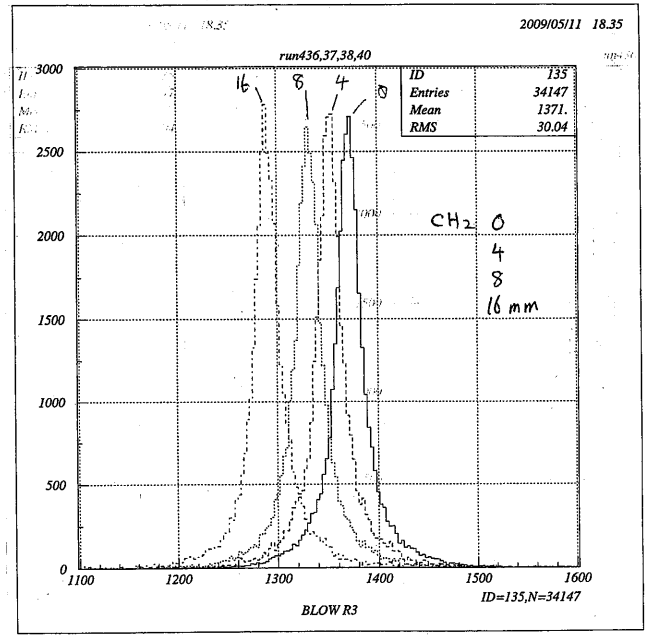
160KHz beam trig

Name	: Sum(M)	M1	M2	M3	M4	M5+	MW1	MW2	MW3	MW4+	MC1	MC2	MC3	MC4+	:Tot/Ana : 53548
53548															
BDCx1	: 99.09	51.54	26.45	12.34	5.22	3.54	63.48	28.21	6.40	1.00	74.48	19.29	4.31	1.02	
BDCx2	: 99.30	48.99	27.06	13.03	5.92	4.31	60.44	29.63	7.76	1.47	73.95	19.60	4.55	1.19	
BDCx3	: 99.42	48.14	26.70	13.64	6.29	4.66	58.33	30.62	8.75	1.72	74.51	19.40	4.49	1.01	
BDCx4	: 99.49	48.53	27.01	13.30	6.02	4.62	59.86	29.60	8.41	1.61	73.86	20.10	4.38	1.15	
BDCx5	: 99.59	47.83	26.85	13.88	6.16	4.86	58.03	30.80	8.96	1.80	73.88	20.14	4.41	1.16	
BDCy1	: 99.33	48.94	27.00	12.90	5.99	4.51	58.67	29.56	9.13	1.97	73.82	20.24	4.13	1.13	
BDCy2	: 99.45	48.00	26.81	13.59	6.25	4.80	57.49	30.44	9.43	2.09	74.22	19.59	4.51	1.13	
BDCy3	: 99.50	48.14	26.70	13.36	6.30	4.99	57.52	29.99	9.73	2.26	73.90	19.93	4.58	1.08	
BDCy4	: 99.46	48.47	26.68	13.17	6.10	5.04	58.67	29.50	9.20	2.10	73.60	20.06	4.52	1.27	
BDCy5	: 99.31	50.78	26.31	12.68	5.54	4.00	61.48	28.26	8.07	1.51	73.86	19.93	4.35	1.18	
FDC1x1	: 98.39	57.39	26.20	9.99	3.30	1.51	84.89	12.47	1.00	0.04	66.18	23.14	6.85	2.21	
FDC1x2	: 98.51	53.37	27.09	11.23	4.42	2.41	71.92	25.34	1.21	0.04	72.71	20.50	4.36	0.95	
FDC1x3	: 97.36	58.29	24.58	9.39	3.43	1.67	72.68	22.53	2.05	0.10	76.74	16.74	3.22	0.66	
FDC1x4	: 98.58	55.77	26.98	10.46	3.70	1.66	84.47	13.16	0.91	0.04	65.16	24.11	6.98	2.32	
FDC1y1	: 98.49	53.85	26.60	11.38	4.25	2.41	78.96	18.04	1.46	0.02	68.53	22.01	6.11	1.83	
FDC1y2	: 98.87	49.20	27.13	12.78	5.69	4.07	66.22	28.00	4.37	0.28	71.92	21.00	4.75	1.20	
FDC1y3	: 98.90	49.03	26.76	13.01	5.96	4.13	65.75	28.04	4.83	0.27	71.94	20.62	4.98	1.36	
FDC1y4	: 98.42	56.33	25.93	10.43	3.91	1.82	82.31	15.09	1.02	0.01	66.21	22.96	6.88	2.37	
FDC2x1	: 96.22	54.43	25.07	10.49	3.91	2.33	64.01	24.49	6.35	1.37	70.08	20.24	4.74	1.17	
FDC2x2	: 96.49	54.04	25.58	10.49	4.05	2.33	63.79	24.54	6.67	1.50	69.19	21.17	4.82	1.31	
FDC2x3	: 96.65	53.75	25.70	10.59	4.16	2.44	63.54	24.71	6.80	1.61	69.37	20.96	5.06	1.25	
FDC2x4	: 96.80	52.20	25.75	11.41	4.61	2.83	62.18	25.52	7.28	1.82	68.21	21.66	5.51	1.42	
FDC3x1	: 97.96	54.03	26.31	10.91	4.25	2.45	66.13	26.32	4.83	0.66	74.40	18.93	3.78	0.84	
FDC3x2	: 98.02	52.37	26.14	11.65	4.84	3.01	64.69	26.28	5.98	1.07	70.11	21.09	5.23	1.59	
FDC3x3	: 97.97	54.10	25.66	10.96	4.57	2.68	66.34	25.11	5.59	0.93	72.61	19.74	4.47	1.16	
FDC3x4	: 97.90	53.65	25.79	11.16	4.50	2.81	64.65	26.49	5.79	0.97	73.49	19.26	4.15	1.00	
FDC3x5	: 97.87	53.77	26.00	11.01	4.37	2.72	66.23	25.06	5.71	0.88	72.39	19.88	4.50	1.10	
FDC3y1	: 98.04	52.51	26.21	11.62	4.65	3.04	64.42	27.20	5.57	0.85	73.69	19.34	4.09	0.93	
FDC3y2	: 97.91	53.83	26.12	11.01	4.41	2.54	66.84	25.15	5.25	0.67	73.14	19.25	4.39	1.12	
FDC3y3	: 97.87	53.96	25.89	11.02	4.47	2.54	66.97	25.05	5.16	0.69	73.07	19.21	4.41	1.19	
FDC3y4	: 97.98	52.55	26.15	11.56	4.73	2.98	64.05	27.17	5.82	0.94	73.16	19.43	4.27	1.11	

160KHz ren trig

Name	: Sum(M)	M1	M2	M3	M4	M5+	MW1	MW2	MW3	MW4+	MC1	MC2	MC3	MC4+	:Tot/Ana :
38911 38911															
BDCx1	: 90.64	26.18	24.44	17.83	10.99	11.20	37.96	35.58	13.95	3.14	56.05	24.23	7.79	2.56	
BDCx2	: 92.26	25.49	23.80	18.27	11.61	13.09	36.86	34.52	16.21	4.68	55.09	25.62	8.45	3.11	
BDCx3	: 93.76	24.62	24.04	18.76	12.16	14.18	34.31	36.67	17.30	5.47	56.04	26.63	8.27	2.83	
BDCx4	: 94.30	24.89	24.42	19.00	12.31	13.69	35.87	35.47	17.76	5.20	55.80	26.73	8.69	3.08	
BDCx5	: 95.61	23.84	24.71	19.25	12.92	14.89	34.07	37.04	18.38	6.12	56.58	27.43	8.65	2.96	
BDCy1	: 92.16	25.19	23.90	18.22	11.49	13.37	34.26	34.63	17.62	5.66	56.56	25.32	7.67	2.61	
BDCy2	: 93.67	24.69	24.15	18.48	12.13	14.21	33.99	34.97	18.66	6.05	57.06	25.84	7.94	2.81	
BDCy3	: 94.72	24.66	24.35	18.72	12.14	14.85	33.62	35.60	18.98	6.52	58.12	25.88	8.00	2.72	
BDCy4	: 94.87	24.39	24.63	18.74	12.12	14.98	34.54	35.97	18.50	5.86	57.04	26.66	8.20	2.96	
BDCy5	: 94.50	25.94	25.39	18.50	11.93	12.75	36.54	36.84	16.70	4.42	58.04	25.73	7.90	2.84	
FDC1x1	: 79.13	29.81	23.59	14.47	6.81	4.46	54.43	20.99	3.42	0.29	41.13	22.73	10.27	5.01	
FDC1x2	: 80.02	27.02	22.89	15.08	8.26	6.78	40.93	33.34	5.40	0.35	49.48	21.76	6.57	2.22	
FDC1x3	: 78.40	29.07	22.95	13.67	7.51	5.20	41.20	29.90	6.57	0.73	50.23	20.16	6.05	1.96	
FDC1x4	: 80.66	29.21	23.70	14.99	7.57	5.20	52.69	23.45	4.10	0.43	41.29	23.32	10.58	5.48	
FDC1y1	: 80.99	28.05	22.76	15.21	8.18	6.79	50.01	26.55	4.37	0.06	48.95	20.70	7.98	3.37	
FDC1y2	: 84.73	25.40	22.26	16.01	9.89	11.18	37.39	34.58	11.52	1.24	54.47	21.36	6.65	2.25	
FDC1y3	: 85.13	25.47	22.06	16.28	9.99	11.33	36.97	34.51	12.07	1.59	54.44	21.48	6.76	2.44	
FDC1y4	: 78.64	29.11	23.13	14.02	7.33	5.05	53.56	22.25	2.78	0.05	42.25	21.82	9.64	4.93	
FDC2x1	: 73.53	28.57	21.22	12.50	6.40	4.85	35.15	24.71	10.16	3.51	42.19	21.79	7.14	2.42	
FDC2x2	: 73.96	28.37	21.17	12.46	6.46	5.50	35.14	24.26	10.61	3.94	41.54	21.96	7.67	2.78	
FDC2x3	: 74.38	28.34	20.77	12.98	6.83	5.47	34.85	24.38	11.10	4.04	41.61	22.06	7.85	2.87	
FDC2x4	: 74.59	27.62	20.45	13.09	7.27	6.16	34.04	24.57	11.43	4.55	41.16	22.08	8.26	3.08	
FDC3x1	: 74.90	27.87	21.19	13.02	7.06	5.75	36.72	26.96	9.23	1.99	46.45	20.55	6.01	1.88	
FDC3x2	: 75.63	27.54	21.09	13.34	7.22	6.44	36.79	25.91	10.12	2.82	43.06	21.60	7.88	3.10	
FDC3x3	: 74.99	27.85	21.16	13.17	7.01	5.81	36.97	25.77	9.76	2.49	44.88	21.10	6.69	2.32	
FDC3x4	: 74.99	27.69	21.16	13.10	6.97	6.07	36.03	26.27	10.03	2.66	45.50	21.23	6.29	1.98	
FDC3x5	: 74.64	27.80	21.12	12.91	6.93	5.89	36.83	25.80	9.48	2.54	45.03	20.87	6.49	2.25	
FDC3y1	: 75.66	27.27	20.96	13.36	7.35	6.73	35.86	27.84	9.68	2.29	47.28	20.24	6.12	2.03	
FDC3y2	: 75.09	28.33	20.93	13.11	7.04	5.67	38.60	25.65	8.93	1.91	46.31	19.96	6.55	2.27	
FDC3y3	: 74.81	28.25	20.88	13.37	6.81	5.50	38.35	25.76	8.81	1.89	46.52	19.87	6.24	2.17	
FDC3y4	: 75.32	27.63	20.57	13.39	7.38	6.34	35.98	27.12	9.74	2.48	46.69	20.25	6.33	2.05	

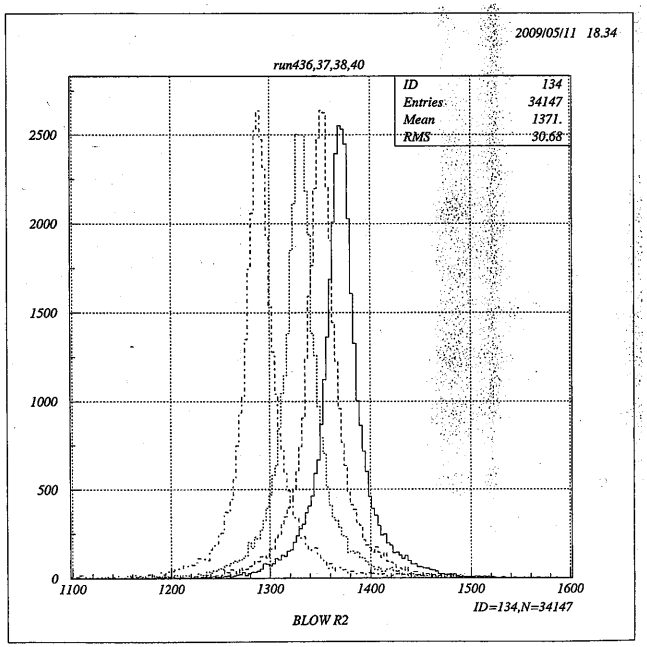
Fが3ぐらい



effective edge で求めた rigidity

δp/p ~ 1% といってるが

(あとfactor 2くらい良くなるはずなんだが



Run 447 Trig. dEL*dER BeamRate = 120kHz TriggerRate 200Hz

! 11.txt 09/05/11 19:20

120KHz
trig=reaction

Name	: Sum(M)	M1	M2	M3	M4	M5+	MW1	MW2	MW3	MW4+	MC1	MC2	MC3	MC4+	:Tot/Ana
: 3750 3750															
BDCx1	: 88.35	31.68	25.04	15.12	9.17	7.33	43.36	31.68	11.17	2.13	57.65	22.00	6.59	2.11	
BDCx2	: 90.45	30.80	26.03	15.65	9.55	8.43	42.43	32.56	12.21	3.25	56.27	25.23	6.72	2.24	
BDCx3	: 92.43	30.85	26.11	17.17	9.01	9.28	41.47	34.08	13.28	3.60	58.99	24.77	6.51	2.16	
BDCx4	: 93.04	31.09	26.35	16.72	10.32	8.56	42.43	33.44	13.57	3.60	57.73	25.92	7.33	2.05	
BDCx5	: 94.51	30.64	26.03	17.87	10.61	9.36	41.15	33.89	15.39	4.08	59.07	25.33	7.63	2.48	
BDCy1	: 90.59	30.64	24.83	17.31	9.44	8.37	39.63	33.52	13.63	3.81	59.71	22.80	6.08	2.00	
BDCy2	: 92.72	31.25	24.88	17.81	9.81	8.96	40.03	33.97	15.39	3.33	60.64	23.68	6.64	1.76	
BDCy3	: 93.23	30.00	26.37	16.99	10.05	9.81	39.65	34.24	15.09	4.24	60.21	23.89	6.96	2.16	
BDCy4	: 93.84	31.49	25.44	17.07	10.24	9.60	41.17	33.44	15.31	3.92	60.80	23.89	6.72	2.43	
BDCy5	: 93.39	33.25	26.03	16.72	9.73	7.65	44.13	33.92	12.61	2.72	61.33	22.80	7.23	2.03	
FDC1x1	: 73.92	34.05	21.55	11.97	4.00	2.35	53.01	18.21	2.61	0.08	43.76	19.15	8.13	2.88	
FDC1x2	: 75.23	32.16	21.65	12.13	5.60	3.68	44.45	27.01	3.44	0.32	50.05	18.19	5.33	1.65	
FDC1x3	: 73.25	33.92	20.93	11.04	5.07	2.29	44.53	23.79	4.45	0.48	49.92	17.52	4.45	1.36	
FDC1x4	: 76.43	34.61	21.65	11.97	5.12	3.07	52.72	20.03	3.49	0.19	45.01	20.00	8.05	3.36	
FDC1y1	: 75.36	32.19	21.81	12.61	5.33	3.41	50.19	22.29	2.85	0.03	50.19	17.49	6.11	1.57	
FDC1y2	: 80.45	29.71	22.53	13.76	7.65	6.80	40.80	30.77	7.87	1.01	53.44	19.39	6.00	1.63	
FDC1y3	: 81.28	30.67	22.51	14.35	7.68	6.08	41.68	30.03	8.69	0.88	54.19	19.09	5.84	2.16	
FDC1y4	: 73.04	32.75	21.47	11.36	4.53	2.93	51.79	19.09	2.00	0.16	44.32	19.01	7.07	2.64	
FDC2x1	: 66.11	30.45	19.20	9.23	4.77	2.45	36.59	20.51	7.33	1.68	41.71	17.65	5.20	1.55	
FDC2x2	: 67.31	31.04	18.80	10.40	4.64	2.43	37.31	20.40	7.84	1.76	42.05	17.87	5.65	1.73	
FDC2x3	: 66.64	30.45	19.15	10.05	4.21	2.77	36.32	21.07	7.31	1.95	41.28	18.32	5.33	1.71	
FDC2x4	: 67.52	30.05	19.07	10.40	5.01	2.99	36.05	20.93	8.35	2.19	40.64	19.41	5.68	1.79	
FDC3x1	: 67.52	30.13	19.39	10.43	4.48	3.09	38.03	21.55	6.64	1.31	44.48	17.28	4.69	1.07	
FDC3x2	: 68.93	31.28	19.65	10.00	4.53	3.47	39.09	21.97	6.59	1.28	43.01	18.19	5.76	1.97	
FDC3x3	: 68.69	31.17	18.88	11.36	4.03	3.25	39.01	21.49	6.64	1.55	43.84	17.89	5.65	1.31	
FDC3x4	: 67.92	29.39	20.40	10.64	4.29	3.20	37.04	22.40	6.91	1.57	43.25	18.75	4.75	1.17	
FDC3x5	: 67.20	29.57	19.95	10.11	4.45	3.12	37.84	21.57	6.56	1.23	43.63	16.61	5.49	1.47	
FDC3y1	: 69.36	30.85	19.09	10.67	5.28	3.47	38.45	22.83	6.69	1.39	45.52	18.16	4.35	1.33	
FDC3y2	: 67.60	30.40	19.41	10.27	4.72	2.80	38.69	21.57	5.84	1.49	44.69	17.44	4.16	1.31	
FDC3y3	: 67.87	30.59	20.56	9.71	4.08	2.93	39.47	21.55	5.89	0.96	44.77	18.13	4.00	0.96	

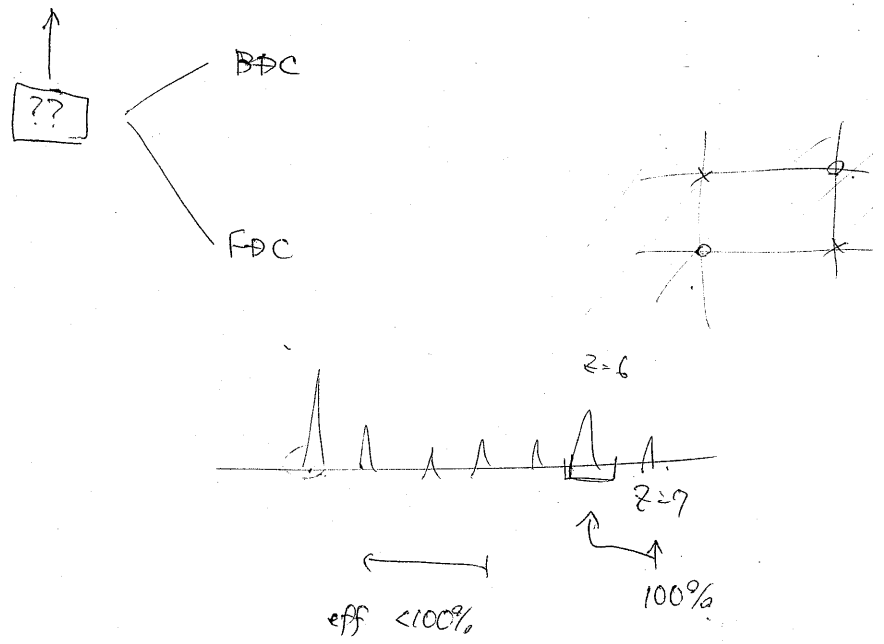
エリアに入って VME-TDCを確認する. No problem.

Run 448 Trig. dEL*dER BeamRate = 6kHz TriggerRate = 10Hz

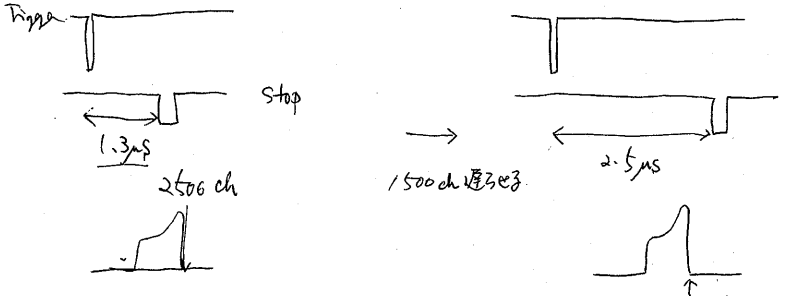
run 448 の途中

beam 6 KHz
trig=reaction

Name	: Sum(M)	M1	M2	M3	M4	M5+	MW1	MW2	MW3	MW4+	MC1	MC2	MC3	MC4+	:Tot/Ana :
1769 1769															
BDCx1	: 72.98	55.57	13.79	3.22	0.23	0.17	60.15	12.04	0.79	0.00	63.60	8.65	0.68	0.06	
BDCx2	: 78.35	56.76	16.11	4.18	1.07	0.23	62.01	13.62	2.43	0.28	66.82	10.23	1.19	0.11	
BDCx3	: 82.76	59.07	18.43	4.01	1.02	0.23	63.31	17.35	1.75	0.34	69.59	11.53	1.41	0.23	
BDCx4	: 85.53	61.62	18.94	4.01	0.79	0.17	66.87	16.62	1.87	0.17	72.70	11.87	0.90	0.06	
BDCx5	: 89.20	62.24	20.24	5.26	1.30	0.17	67.04	19.28	2.32	0.57	75.75	12.10	1.30	0.06	
BDCy1	: 78.97	55.00	17.64	4.80	1.24	0.28	59.69	16.28	2.71	0.28	68.17	9.72	1.07	0.00	
BDCy2	: 82.14	58.51	17.30	4.92	1.19	0.23	62.92	16.73	2.37	0.11	71.28	9.38	1.36	0.11	
BDCy3	: 84.23	59.19	19.22	4.92	0.79	0.11	63.26	18.37	2.43	0.17	72.19	10.85	1.07	0.11	
BDCy4	: 85.70	60.37	19.73	4.69	0.73	0.17	66.20	17.41	1.98	0.11	73.04	10.80	1.58	0.28	
BDCy5	: 85.70	64.10	17.58	3.45	0.34	0.23	69.47	14.58	1.53	0.11	74.34	10.29	1.02	0.06	
FDC1x1	: 41.89	35.33	6.16	0.23	0.11	0.06	38.50	3.28	0.06	0.06	37.42	4.30	0.11	0.06	
FDC1x2	: 43.19	35.78	6.33	0.90	0.17	0.00	39.12	3.96	0.11	0.00	37.99	4.69	0.45	0.06	
FDC1x3	: 37.42	31.83	4.97	0.57	0.06	0.00	34.09	3.17	0.17	0.00	33.01	4.07	0.34	0.00	
FDC1x4	: 43.70	34.65	7.63	1.19	0.23	0.00	38.33	5.03	0.34	0.00	37.37	5.37	0.90	0.06	
FDC1y1	: 43.02	34.54	7.69	0.73	0.06	0.00	38.55	4.35	0.11	0.00	38.04	4.69	0.28	0.00	
FDC1y2	: 54.32	41.55	10.57	1.70	0.51	0.00	45.79	7.97	0.57	0.00	46.18	7.35	0.68	0.11	
FDC1y3	: 55.68	41.83	11.08	2.15	0.62	0.00	46.18	9.04	0.40	0.06	46.98	7.63	0.90	0.17	
FDC1y4	: 36.12	29.79	5.71	0.51	0.11	0.00	33.47	2.60	0.06	0.00	31.77	4.07	0.23	0.06	
FDC2x1	: 24.42	20.41	3.39	0.51	0.11	0.00	21.54	2.71	0.17	0.00	21.99	2.20	0.17	0.06	
FDC2x2	: 25.44	20.63	4.18	0.57	0.06	0.00	23.06	2.20	0.11	0.06	21.65	3.39	0.40	0.00	
FDC2x3	: 27.08	23.18	3.28	0.34	0.23	0.06	24.87	1.98	0.23	0.00	24.19	2.43	0.45	0.00	
FDC2x4	: 27.70	22.84	4.07	0.79	0.00	0.00	24.99	2.71	0.00	0.00	23.86	3.34	0.51	0.00	
FDC3x1	: 27.30	22.78	3.62	0.79	0.11	0.00	23.86	3.17	0.28	0.00	24.36	2.32	0.57	0.06	
FDC3x2	: 28.26	23.12	4.52	0.51	0.06	0.06	24.76	3.28	0.23	0.00	24.82	3.22	0.23	0.00	
FDC3x3	: 27.81	23.86	3.50	0.40	0.06	0.00	24.31	3.34	0.17	0.00	25.44	2.32	0.06	0.00	
FDC3x4	: 27.81	23.86	3.50	0.40	0.06	0.00	24.82	2.83	0.17	0.00	25.44	2.20	0.17	0.00	
FDC3x5	: 26.96	22.72	3.39	0.73	0.11	0.00	23.63	2.94	0.40	0.00	23.91	2.83	0.23	0.00	
FDC3y1	: 30.07	24.87	4.47	0.68	0.06	0.00	25.95	3.90	0.23	0.00	27.30	2.66	0.11	0.00	
FDC3y2	: 27.25	23.12	3.56	0.57	0.00	0.00	24.31	2.71	0.23	0.00	24.48	2.54	0.23	0.00	
FDC3y3	: 27.93	24.19	3.11	0.45	0.06	0.11	25.38	2.09	0.34	0.11	25.27	2.43	0.17	0.06	
FDC3y4	: 29.28	24.08	4.24	0.90	0.06	0.00	25.10	3.84	0.34	0.00	26.00	2.88	0.40	0.00	

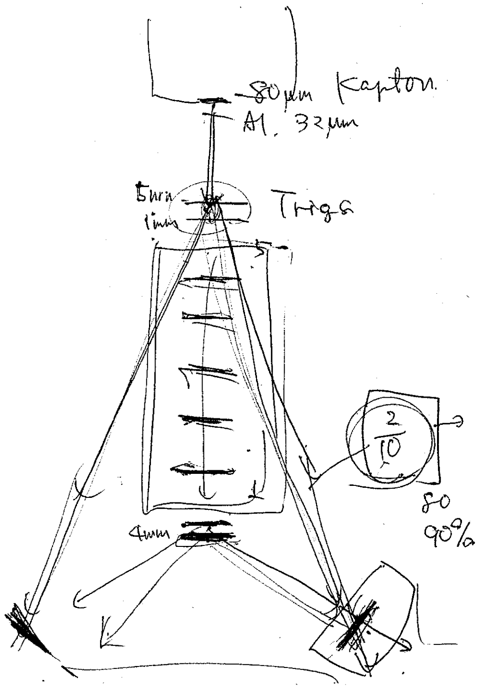


(VME stop1)
VME-TDC の コモン Stop の delay を 調整する.



The Efficiency ~~doesn't change~~ isn't improved at all.

Run 449 VME stop 2.5μs delay



Hodscope の ΔE から Z=6 を選ぶと. efficiency が ~99% になった。
Excellent!

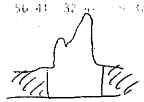
RUN-0441 START => 15:59:55 STOP => 16:45:23 PRINT => xx:xx:xx May 11 2009
Intensity was increased during this run

z=6 selected in hodoscope

#Events : 210282
Next Raw Data File ? [y/n: n] > Name : Sum(M) M1 M2 M3 M4 M5+ MW1 MW2 MW3 MW4+ MC1
MC2 MC3 MC4+ :Tot/Ana : 210282 16687

Name	Sum(M)	M1	M2	M3	M4	M5+	MW1	MW2	MW3	MW4+	MC1	MC2	MC3	MC4+
BDCx1	99.86	49.01	29.39	13.38	5.30	2.79	61.19	30.54	7.05	1.07	73.60	20.71	4.58	0.97
BDCx2	99.88	46.99	29.25	14.26	5.91	3.47	58.20	31.83	8.22	1.62	73.31	21.00	4.58	0.99
BDCx3	99.98	45.47	29.26	14.63	6.35	4.26	55.65	33.03	9.39	1.90	73.23	21.24	4.39	1.11
BDCx4	99.94	45.66	29.23	14.77	6.51	3.76	56.41	32.47	9.37	1.68	73.33	21.25	4.55	0.82
BDCx5	99.97	44.78	29.50	14.60	6.75	4.33	55.18	33.16	9.53	2.10	72.67	21.54	4.68	1.07
BDCy1	99.94	46.65	29.44	14.50	5.95	3.40	55.86	33.13	9.20	1.74	74.30	20.42	4.35	0.87
BDCy2	99.97	45.24	29.78	14.28	6.44	4.24	54.65	33.44	9.79	2.09	73.80	20.96	4.24	0.98
BDCy3	99.98	45.61	29.14	14.86	6.15	4.22	54.91	32.70	10.37	2.00	73.69	21.09	4.34	0.86
BDCy4	99.94	44.89	29.33	14.80	6.53	4.39	55.69	32.32	9.97	1.97	72.33	21.53	4.97	1.12
BDCy5	99.93	48.52	29.41	13.42	5.45	3.13	60.06	30.54	8.03	1.30	73.78	21.00	4.21	0.94
FDC1x1	99.77	55.97	29.24	10.16	3.45	0.94	81.69	16.74	1.28	0.06	67.80	24.25	6.03	1.68
FDC1x2	99.80	53.36	28.12	11.97	4.30	2.06	71.09	26.96	1.69	0.07	73.94	20.58	4.33	0.95
FDC1x3	97.91	56.51	26.79	10.16	3.18	1.28	71.47	23.90	2.40	0.14	75.23	18.44	3.52	0.73
FDC1x4	99.84	54.35	29.42	11.13	3.48	1.46	79.92	18.18	1.70	0.04	67.44	24.41	6.23	1.76
FDC1y1	99.77	54.02	28.20	11.90	3.91	1.75	77.94	20.00	1.82	0.01	70.61	22.45	5.45	1.26
FDC1y2	99.85	48.82	28.22	13.90	5.71	3.21	65.19	29.78	4.58	0.29	73.12	20.96	4.75	1.02
FDC1y3	99.90	48.76	27.84	14.17	5.64	3.49	64.94	29.02	5.60	0.34	73.13	20.60	5.05	1.12
FDC1y4	99.80	55.74	28.90	10.61	3.28	1.26	79.95	18.46	1.35	0.04	69.29	22.92	6.10	1.48
FDC2x1	97.47	55.38	26.67	10.51	3.47	1.44	62.50	26.70	6.91	1.35	66.24	24.40	5.59	1.23
FDC2x2	97.65	53.86	27.78	10.74	3.70	1.57	61.22	27.38	7.50	1.55	64.88	25.42	6.20	1.15
FDC2x3	97.95	53.79	27.73	10.63	4.22	1.59	61.22	27.51	7.51	1.71	65.09	25.41	6.07	1.37
FDC2x4	98.03	52.55	27.56	11.75	4.19	1.98	60.08	27.96	8.07	1.92	64.45	25.30	6.75	1.53
FDC3x1	99.73	55.37	27.72	10.95	3.98	1.71	63.52	28.27	7.05	0.89	72.39	22.35	4.20	0.79
FDC3x2	99.80	54.47	27.30	11.61	4.36	2.06	62.49	28.15	7.77	1.38	70.11	23.01	5.50	1.17
FDC3x3	99.74	55.02	27.12	11.54	4.36	1.71	62.79	28.08	7.68	1.19	70.97	22.86	4.88	1.03
FDC3x4	99.46	54.47	27.43	11.51	4.10	1.95	62.23	28.27	7.56	1.40	70.64	23.12	4.71	0.99
FDC3x5	99.55	55.38	27.32	11.31	3.76	1.79	63.06	28.33	7.03	1.13	70.61	22.68	5.25	1.01
FDC3y1	99.83	53.90	27.67	11.85	4.12	2.29	62.75	28.79	7.17	1.11	72.46	21.68	4.72	0.97

M1~ が 99% には



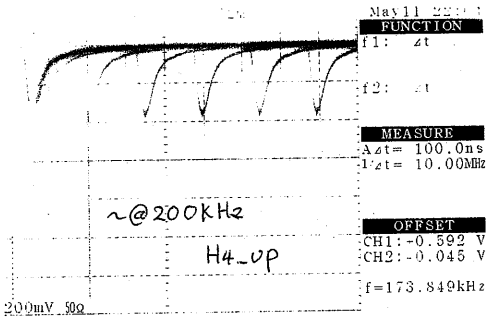
定 13.txt

FDC1x4 : 99.84 54.35 29.42 11.13 3.48 1.46 79.92 18.18 1.70

Name	Sum(M)	M1	M2	M3	M4	M5+	MW1	MW2	MW3	MW4+	MC1	MC2	MC3	MC4+
FDC3y2	99.21	54.85	27.24	11.40	4.00	1.73	64.02	27.46	6.79	0.94	72.28	21.65	4.39	0.89
FDC3y3	99.14	54.79	27.84	11.09	3.72	1.72	64.14	27.63	6.46	0.92	72.08	21.98	4.30	0.79
FDC3y4	99.51	53.78	27.48	11.58	4.46	2.21	62.28	28.22	7.75	1.26	71.57	22.07	4.87	1.00

VME-TDC common stop の delay を 1.3μs に もどした.

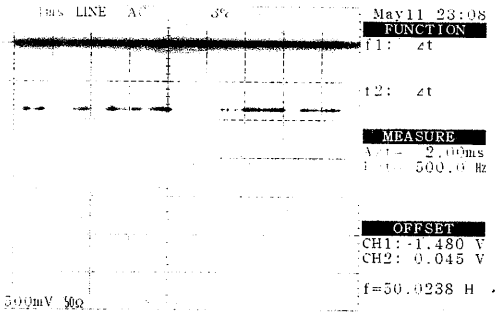
RUN450 Beam=84 kHz Trigger=143 Hz. Trig=Reaction



Beam is off., because beam is unstable. for some time

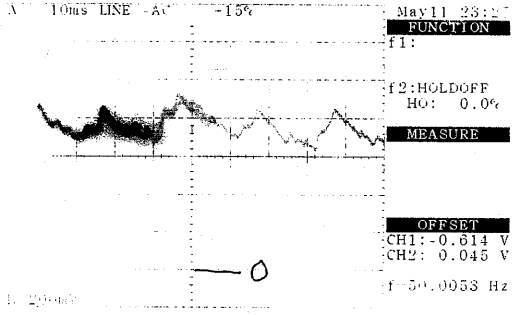
22:20 Beam is back.

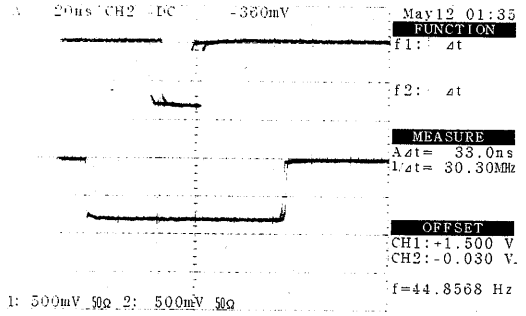
Run 451 Trig=Reaction BeamRate=360 kHz TrigRate 500Hz (500kevt)



yale meter out

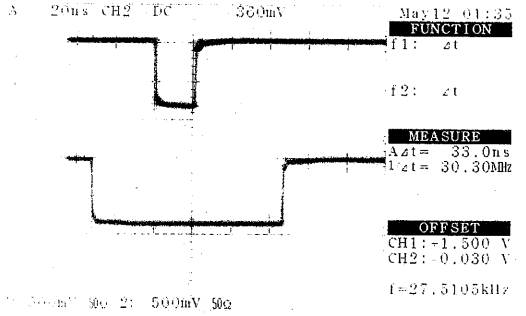
τ= 30msec





beam (delayed)

ΔEL*R

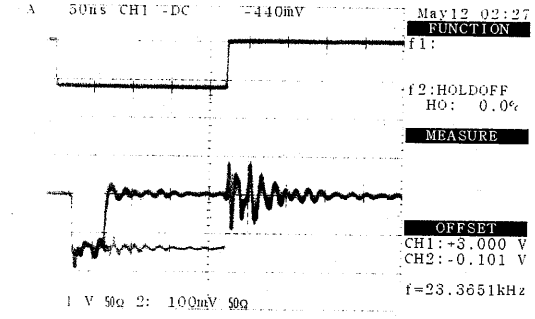


beam (delayed)

HOD

⇓

beam * (ΔEL*R) * (HOD) のトリガーにできる.



TFC から出るgate

TFC out

5/12(火)

2:25ビ頁

一応 回路の check がおわる.

beam × ΔE × hod

dummy beam trig

run 452, 5/12 2:30～ 233k events

20kHz, 4mm CH2

trig = beam

run 453, 2:35～ 4:00 rf down 99k events

20kHz, 4mm CH2

beam × (ΔEL*R) * hod			trig
○	○		30Hz
○	○	○	20Hz

run 454, 4:20～7:00 157k events

rf スッキ後

beam～18kHz, beam × (ΔELR) * hod

run 455, 7:00～8:20 63k events

continue, reac trig.

run 456, 8:20～8:28 500k events. beam off.

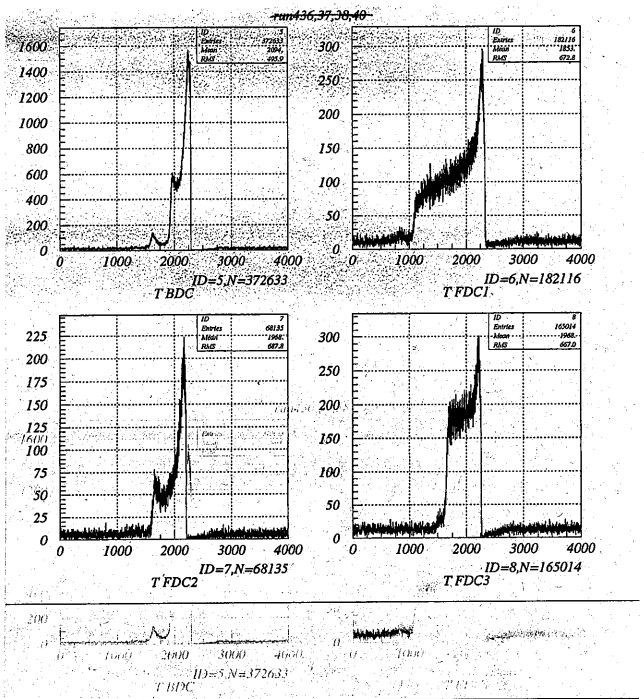
同条件で

beam trig ~15KHz

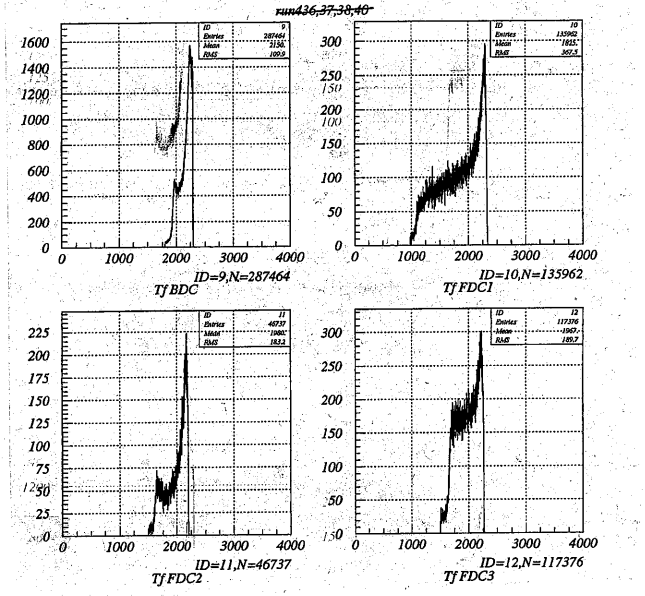
run 457, 8:32～ 100k events

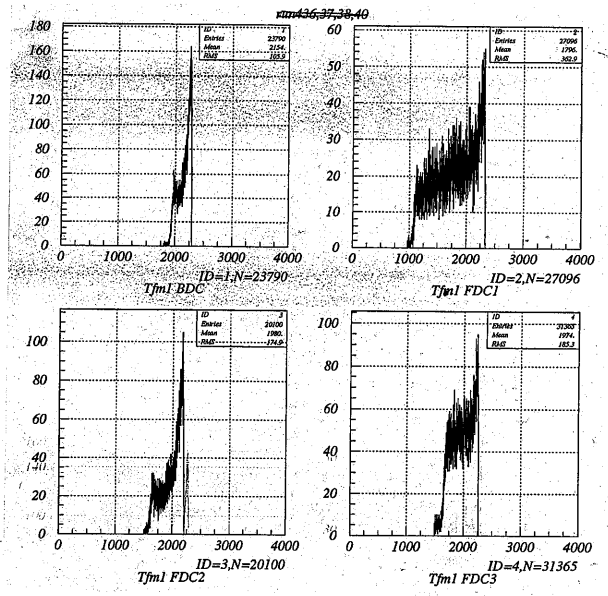
TC 10n/640n

↘ 052005020274

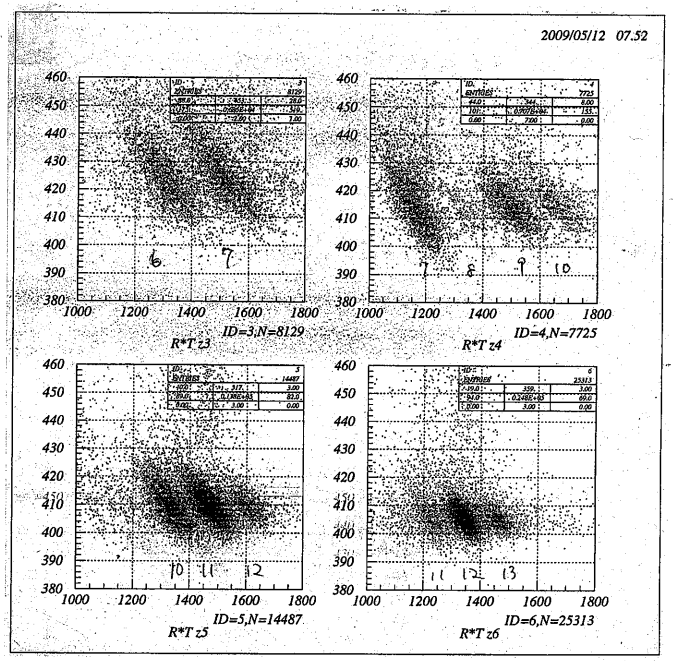


2009/05/12 03.01





2009/05/12 07.52



Tetsuya Ohnishi, 09.5.11 7:55 PM +0900, 実験終了時について

Date: Mon, 11 May 2009 19:55:19 +0900 (JST)
To: kobayash@lambda.phys.tohoku.ac.jp, otsu@ribf.riken.jp
Cc: nfukuda@riken.jp, takeda@ribf.riken.jp
Subject: 実験終了時について
From: Tetsuya Ohnishi <oonishi@ribf.riken.jp>
X-SPF-Scan-By: smf-spf v2.0.2 - http://smfs.sf.net/
X-Virus-Status: Clean

小林様、大津様

実験終了時の片付けについてです。
明日朝 9:00 に終了しましたら、

1) Kappa 磁石の電流をおとし、電源を D8 へ切り替えておいて
頂けますようお願いします。
2) BigRIPS 側の電磁石はそのまま励磁状態で構いません。
こちらの方でやることが若干残っていますので。
3) 検出器周りなどの片付けなどをされるかと思いますが、セットアップを
保持する予定でしたら、以前と同様にコーンを立てて立ち入りできない
ようにするようお願いします。

をお願いします。
一応 BigRIPS 側も 9:00 -- 9:30 頃には下にいくかと思いますが、
上記のことを先にお願いします。

To: 福田さん
もし先に来られた場合は、各チェンバーの GV を閉めておいて下さい。

以上よろしくお願いします。

理化学研究所 仁科加速器研究センター原子核研究部門
実験装置運転・維持管理グループ RI ビーム分離生成装置チーム
大西哲哉
oonishi@ribf.riken.jp

215 - 350 - 515

① Kappa
1100 A → OA.

② CAEN

980V	456μA
980V	〃
1070V	496
1120V	520
1300V	1188
1250V	1120

off

③ DC

B	−2052V
F1	+1151V / −2500V
F2	−2301 / −1441
F3	+876 / −2500

④

@ OVの状態	DC on	D8(R)	K(L)
	on	off	off

ポン ポン 音？

@ 現場(PS)
remote 入 } on → local +1

@ Kappa

off	off	on
↓ スイッチを D8 側へ		
off	on	off

1192

@ PS 現場
漁量不足
remote
入にはならない。

- He + CH_4　45気圧 / 0.3気圧 → close　バブラー 5.3°C　メモリ=1
- He　10気圧 / 0.35気圧 → close

流量計はそのままにする

→ あとで return 側を開放へ. ⇐ DC + Hebag.

- Hod　HV 1300V → 500V off
  distributor off

- target はずす
- beam exit　ホゴダンボール
- beam stopper は 0° へ
- BDC の 上流 / 下流 にはホゴ板

~9:30

Log Note　PDF へ

Beam Stopper 放射化測定

大西　4869 / 4715

福田　4868 / 4716

竹田　4837

須田　4861(PHS)　4114(内)

4681　Big RIPS

4129　Control

4688　Kaya / Samurai

小林

Kappa 試験案 v02

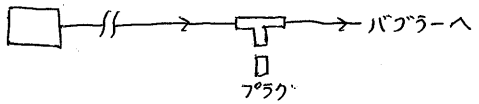
* 実験室内の確認
  * He+CH4 流量、残量、✓
  * Isopropanol(C3H8O)残量、温度 ✓
  * F12 真空窓保護膜　除去、✓ gate valve ✓
  * Kappa　1100A 励磁、周辺確認 ✓
  * 冷却水　250L/min、温度 ✓
  * Beam stopper @13.5° ✓
  * 標的箱を持ってくる✓
* ビームトランスポート
  * F12 まで通す
  * HV 調整
    * 大体できているが、SF12A/SF12B、window discri の set
    * 強度 1K-10K HZ 付近
    * HOD
      * これまで 1380V-X、10dB Att. Into FERA -> 500-750ch
      * Att の前は約 2V
      * 平均をとると２山？
      * Att をはずして HV を下げる？
      * まず前日と同じ状態から始める
    * DC に以前の電圧をかける
      * BDC 2050, FDC1 1150, FDC2 2300, FDC3 875V
  * Trigger timming の確認
* check
  * Beam phase space
    * 像の大きさ、焦点の位置
    * 強度
  * FDC2/FDC3/HOD でのビーム位置
    * HOD-ADC
    * 位置を変える必要があるか？
  * その他の検出器の確認
  * FDC2 の HV plateau を取り直す
  * 念の為、この状態でデータをとる
  * 他の状態でのデータ
    * BDC 2000, FDC1 (1150), FDC2 (2300), FDC3 800
* HOD の HV 変更

* Sweep data
  * ?BIGRIPS control で電流指定で設定可能？
  * FDC2/FDC3/HOD の移動／回転：　y=255, ang=0, H1 on beam line
  * I=0A と 1100A の HOD 位置を確認。予想との比較
  * 約 160A step で位置の確認
  * sweep data をとる
* 位置校正用データ：　ビーム強度 10-20KHz
  * CH2 target はずす
    * 一度 1100A に上げてから、再度電流 0 にセット (DC on/off?)
    * I= 0A, y=0, ang=0°
    * I= 0A, y=0, ang=13.5°
    * I= 1100A, y=440, ang=13.5°
  * CH2 target, 2mm, 4mm, (5mm), 10mm, 15mm
    * I= 1100A, y=440, ang=13.5° 、Beam_trigger
    * 同上、reaction trigger (dEL+dER 又は dEL*dER)

backup

- fe (front end)
  - ✓ exp_feb09 / fera
    solaq
  - ✓ /mnt1/rawdata/exp_feb09 ⟶
- be (back end)
  - ✓ exp_feb09

・ リターン側のバブラー上流に T をつける



Heの分圧による低圧力化を防ぐため
プラグ開放

・ 流量計

$\frac{Q(He+60\%CH_4)}{Q(Ar)} = 1.89$

$\frac{Q(He)}{Q(Ar+C_4H_{10})} = 3.3$

$\frac{Q(He+60\%.CH_4)}{Q(He)} =$

Ar 100		
He 100	Hebag FDC23	
He 20	Hebag 上流	
Ar 50	FDC2	
Ar 50	FDC3	
Ar 50	FDC1	
Ar 50		
Ar 20	BDC	← このへんは定常状態では 5~7cc/min (Ar) を流していた。最少は 5-50なので少し不安定 20cc/min (Ar) の方が良い。
Ar 20		
Ar 20		
Ar 20		
Ar+iC_4H_{10} 60	Hebag大	

・BDC 上流側 ホゴ板 作ル

・ $He+CH_4$

残圧 #2 17K
#3 45K
#4 新

Heボンベ 2本から
圧縮He

・イソプロピルアルコール fill

←イソプロピルアルコール
6本かう.

バブラーの構造を改良する必要あり.

Veto シンチのPMTにラベル　VP01～VP10をつける

VP01 (SHV) —— VP02 (MHV)　もともとOK

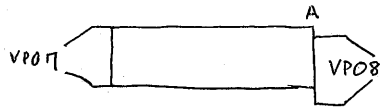
VP03 (MHV) — VP04 (SHV)　VP04側のPMTがとれてりた → つけなおす

VP05 (MHV) — VP06 (MHV)　VP06側の シンチ-ライトガイド 接着（水平，小林）

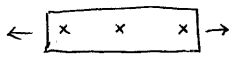
VP07 (MHV) — VP08 (SHV)　VP08側の シンチ-ライトガイド 接着（たて，内田#2）
ただし ライトガイドとシンチにすき間あり

VP09 (MHV) — VP10 (SHV)　VP09側の シンチ-ライトガイド 接着（たて，鈴木#1）
接着剤がたれたが，はがす．

VP07-VP08間は，下のようになっているので A サイドを立方の内側にする



^{137}Cs によるテスト



左，中央，右の pulse height
光もれ？

必ずず　A1 —50Ω
A2 ——→ BNC で見る

5/13. 光もれ check

	HV.		
VP01	-1100V	光もしを見る．10Hz 程度の信号	～5mVが多い．
	黒い幕で．VP01側，02側をおおっても変化はない．		
VP03	上と同様．10Hzで-5mV		
VP05	-1100V	10mVくらいの信号もある（-5mVがメイン）	150Hzくらい
	光もしはしていないと思う（どこをおおっても変化なし）		
VP07	-1100V	30Hz程度で．-5mV程度が多い．	
VP09	-1100V	100Hzで．-5mV	
VP02 (SHV)	-1100V	トリガーを-1mVで 80Hzくらい	-5mVくらい．
たぶんページは間違い．			
VP04	-1100V	-3mVくらい．20Hzくらいトリガー -1mV．	
VP06	-1100V	-5mVくらい 150Hzくらいトリガー -1mV	
VP08	-1100V	-5mVくらい 150Hzくらい トリガー-1mVにした．	
VP10	-1100V	-5mV	150Hz -1mV

光もしは．ないようだ。

167 5/13

Mesytec MADC-32 7台

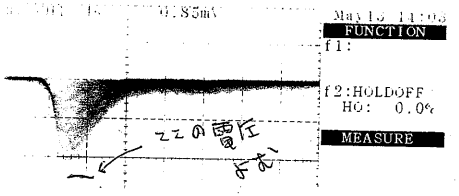
型番 (V121C.
V121-4508 10/30
↑ ↑
30台

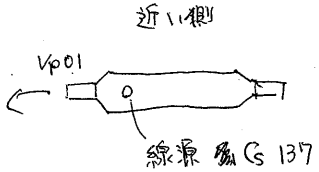
馬場さんがテストしたもの SM-HM001

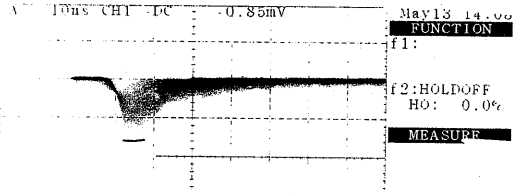
仁木 経由で 送りが入す

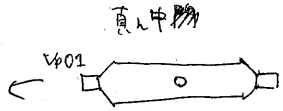
Veto シンチ の γ線 (Cs 137) の信号.

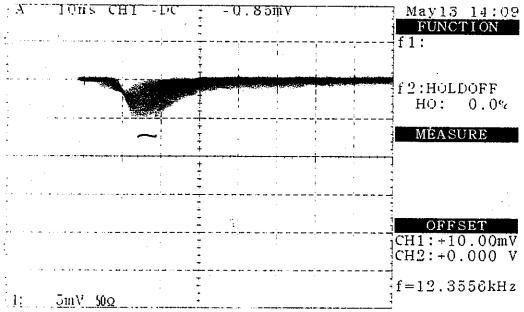
Vp 01. の 近い側 にソースを置いたとき. (-1400 V)

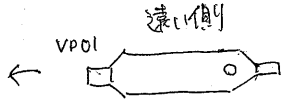












• VP01

電圧(V)	近い(mV)	真ん中(mV)	遠い(mV)
-1300	7	5	4
-1400	12	7	6
-1500	22	13	11
-1600	35	25	20
-1700	65	45	30
-1800	100	70	50

→ ノイズ 11mV

• VP02

電圧(V)	近い(mV)	真ん中(mV)	遠い(mV)
-1300	5	4	3
-1400	10	6	5
-1500	15	10	7
-1600	24	15	12
-1700	45	25	20
-1800	70	40	30
-1900	100	60	50

---≃ 0.5MeV
→ ノイズ 15mV

• VP03

電圧(V)	近い(mV)	真ん中(mV)	遠い(mV)
-1300	5	3	3
-1400	8	5	4
-1500	12	7	6
-1600	20	12	8
-1700	35	20	16
-1800	52	30	22
-1900	80	50	40

→ ノイズ 10mV

• VP04

電圧(V)	近い(mV)	真ん中(mV)	遠い(mV)
-1300	3	2	2
-1400	5	4	3
-1500	8	5	4
-1600	~~12~~ 15	9	7
-1700	24	15	11
-1800	38	22	17
-1900	55	38	25
-2000	90	50	40

→ ノイズの明るい最高 10mV

・VP05

電圧(V)	近い(mV)	中(mV)	遠い(mV)	
-1300	13	9	7	
-1400	26	16	13	
-1500	50	30	23	
-1600	90	55	45	
-1700	150	90	70	→ イイズ 15mV

・VP06

電圧(V)	近い(mV)	真ん中(mV)	遠い(mV)	
-1300	10	7	5	
-1400	18	12	8	
-1500	35	20	18	
-1600	55	35	25	
-1700	100	60	40	→ イイズ 10mV

・VP07

電圧(V)	近い(mV)	真ん中(mV)	遠い(mV)	
-1300	8	5	4	
-1400	14	8	6	
-1500	25	13	10	
-1600	45	25	18	
-1700	70	40	35	
-1800	110	60	50	→ イイズ 12mV

・VP08

電圧(V)	近い(mV)	真ん中(mV)	遠い(mV)	
-1300	8	5	4	
-1400	15	9	7	
-1500	25	15	11	
-1600	40	25	18	
-1700	60	40	30	
-1800	110	70	50	→ イイズ 12mV

・VP09

電圧(V)	近い(mV)	真ん中(mV)	遠い(mV)	
-1300	8	5	4	
-1400	15	9	7	
-1500	27	15	12	
-1600	50	28	20	
-1700	80	50	35	
-1800	130	70	50	→イイズ 13m

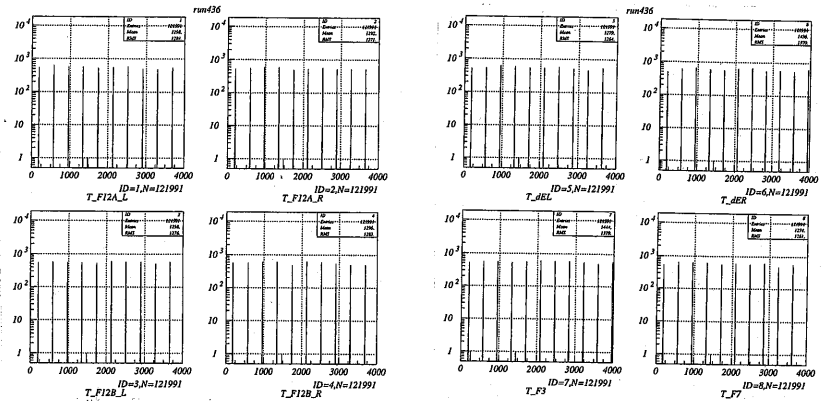
・VP10

電圧(V)	近い(mV)	真ん中(mV)	遠い(mV)	
-1300	10	7	5	
-1400	18	11	8	
-1500	35	22	15	
-1600	60	40	28	
-1700	90	60	45	
-1800	160	100	75	→ イイズ 15m

tmcal.

→ r424 10n
425 20n
→ 457 10n

tmcal1 beam 0~4000
2 hod 0~2000



50ch~3750ch

```
stgrm file name :  tmcal1_r457.hbook
ow  limit of tdc channel    :    50.000000     /
igh limit                   :  3750.000       /
hreshold (fraction of max)  :     0.50000001E-01 /
ime interval (nsec)         :    10.00000     /
id=   1 #bin= 4000 title=T_F12A_L
 total=   16391.    max=     559.    threshold=      28.
 peak( 1) x=   202.737  sigma=   1.26707
 peak( 2) x=   598.539  sigma=   1.23744
 peak( 3) x=   985.913  sigma=   1.25000
 peak( 4) x=  1373.196  sigma=   1.58114
 peak( 5) x=  1765.671  sigma=   1.41421
 peak( 6) x=  2153.624  sigma=   1.22474
 peak( 7) x=  2542.889  sigma=   1.41421
 peak( 8) x=  2932.494  sigma=   1.73205
 peak( 9) x=  3321.579  sigma=   1.73205
 peak(10) x=  3711.542  sigma=   1.00000
 #peaks found :      10
   9   1  2.5672806E-02     0.019     10    T_F12A_L
id=   2 #bin= 4000 title=T_F12A_R
 total=   16391.    max=     522.    threshold=      26.
 peak( 1) x=   222.893  sigma=   1.34774
 peak( 2) x=   611.324  sigma=   1.23744
 peak( 3) x=   992.909  sigma=   1.22474
 peak( 4) x=  1374.116  sigma=   1.41421
 peak( 5) x=  1759.305  sigma=   1.22474
 peak( 6) x=  2141.790  sigma=   1.41421
 peak( 7) x=  2524.625  sigma=   1.00000
 peak( 8) x=  2908.371  sigma=   1.00000
 peak( 9) x=  3291.242  sigma=   1.41421
 peak(10) x=  3674.885  sigma=   1.00000
 #peaks found :      10
   10   2  2.6091371E-02     0.014     10    T_F12A_R
id=   3 #bin= 4000 title=T_F12B_L
 total=   16391.    max=     541.    threshold=      27.
 peak( 1) x=   224.278  sigma=   1.42932
 peak( 2) x=   614.306  sigma=   1.22474
 peak( 3) x=   997.330  sigma=   1.22474
 peak( 4) x=  1380.040  sigma=   1.45774
 peak( 5) x=  1766.768  sigma=   1.22474
 peak( 6) x=  2150.472  sigma=   1.58114
 peak( 7) x=  2534.936  sigma=   1.00000
 peak( 8) x=  2919.987  sigma=   1.73205
 peak( 9) x=  3304.438  sigma=   1.00000
 peak(10) x=  3689.713  sigma=   1.00000
 #peaks found :      10
   11   3  2.5991807E-02     0.015     10    T_F12B_L
id=   4 #bin= 4000 title=T_F12B_R
 total=   16391.    max=     547.    threshold=      27.
 peak( 1) x=   201.368  sigma=   1.28847
 peak( 2) x=   595.678  sigma=   1.25000
 peak( 3) x=   983.446  sigma=   1.25000
 peak( 4) x=  1370.909  sigma=   1.58000
 peak( 5) x=  1762.588  sigma=   1.22474
 peak( 6) x=  2151.004  sigma=   1.41421
 peak( 7) x=  2540.291  sigma=   1.22474
 peak( 8) x=  2929.943  sigma=   1.00000
 peak( 9) x=  3318.892  sigma=   0.00000
 peak(10) x=  3708.538  sigma=   1.00000
 #peaks found :      10
   12   4  2.5678437E-02     0.012     10    T_F12B_R
id=   5 #bin= 4000 title=T_dEL
 total=   16391.    max=     558.    threshold=      28.
 peak( 1) x=   203.999  sigma=   1.41973
 peak( 2) x=   589.454  sigma=   1.23744
 peak( 3) x=   978.858  sigma=   1.25000
 peak( 4) x=  1352.551  sigma=   1.45774
 peak( 5) x=  1758.701  sigma=   1.22474
 peak( 6) x=  2121.382  sigma=   1.22474
 peak( 7) x=  2506.684  sigma=   1.22474
 peak( 8) x=  2888.570  sigma=   1.58114
 peak( 9) x=  3271.553  sigma=   1.00000
 peak(10) x=  3655.733  sigma=   1.41421
 #peaks found :      10
   13   5  2.6078708E-02     0.007     10    T_dEL
id=   6 #bin= 4000 title=T_dER
 total=   16391.    max=     575.    threshold=      29.
 peak( 1) x=   220.142  sigma=   1.35929
 peak( 2) x=   597.505  sigma=   1.21192
 peak( 3) x=   970.437  sigma=   1.19896
 peak( 4) x=  1342.951  sigma=   1.58000
 peak( 5) x=  1720.111  sigma=   1.22474
 peak( 6) x=  2093.900  sigma=   1.22474
 peak( 7) x=  2468.570  sigma=   1.41421
 peak( 8) x=  2843.668  sigma=   0.70711
 peak( 9) x=  3218.309  sigma=   1.41421
 peak(10) x=  3593.513  sigma=   1.00000
 #peaks found :      10
   14   6  2.6689155E-02     0.006     10    T_dER
id=   7 #bin= 4000 title=T_F3
 total=   16392.    max=     594.    threshold=      30.
 peak( 1) x=   220.405  sigma=   1.29904
 peak( 2) x=   599.627  sigma=   1.23744
 peak( 3) x=   975.733  sigma=   1.17260
 peak( 4) x=  1350.833  sigma=   1.41421
 peak( 5) x=  1730.582  sigma=   1.22474
 peak( 6) x=  2106.831  sigma=   1.00000
 peak( 7) x=  2484.137  sigma=   1.41421
 peak( 8) x=  2861.639  sigma=   1.41421
 peak( 9) x=  3238.536  sigma=   1.00000
 peak(10) x=  3615.857  sigma=   0.00000
 #peaks found :      10
   15   7  2.6511487E-02     0.006     10    T_F3
id=   8 #bin= 4000 title=T_F7
 total=   16391.    max=     542.    threshold=      27.
 peak( 1) x=   199.883  sigma=   1.28391
 peak( 2) x=   582.422  sigma=   1.23744
 peak( 3) x=   962.976  sigma=   1.27475
 peak( 4) x=  1343.401  sigma=   1.50000
 peak( 5) x=  1728.426  sigma=   1.32288
 peak( 6) x=  2109.979  sigma=   1.22474
 peak( 7) x=  2492.514  sigma=   1.22474
 peak( 8) x=  2875.392  sigma=   1.22474
 peak( 9) x=  3257.675  sigma=   1.41421
 peak(10) x=  3640.585  sigma=   1.00000
 #peaks found :      10
   16   8  2.6155261E-02     0.008     10    T_F7

 8-samples: average=  2.6108632E-02
```

```
hstgrm file name :  tmcal1_r424.hbook
low  limit of tdc channel   :     5.000000     / 50
high limit                  :  1990.000       / 3750
threshold (fraction of max) :     0.50000001E-01 /
time interval (nsec)        :    10.00000     /
id=   1 #bin= 4000 title=T_F12A_L
 total=   19361.    max=     627.    threshold=      31.
 peak( 1) x=   181.548  sigma=   1.17503
 peak( 2) x=   576.125  sigma=   1.34629
 peak( 3) x=   962.626  sigma=   1.19896
 peak( 4) x=  1348.625  sigma=   1.27475
 peak( 5) x=  1741.828  sigma=   1.41421
 peak( 6) x=  2130.557  sigma=   1.41421
 peak( 7) x=  2519.857  sigma=   1.00000
 peak( 8) x=  2908.493  sigma=   1.73205
 peak( 9) x=  3298.483  sigma=   1.41421
 peak(10) x=  3687.992  sigma=   1.41421
 #peaks found :      10
   1   1  2.5683329E-02     0.020     10    T_F12A_L
id=   2 #bin= 4000 title=T_F12A_R
 total=   19361.    max=     603.    threshold=      30.
 peak( 1) x=   200.632  sigma=   1.22315
 peak( 2) x=   589.226  sigma=   1.32288
 peak( 3) x=   969.900  sigma=   1.19896
 peak( 4) x=  1349.731  sigma=   1.27475
 peak( 5) x=  1736.448  sigma=   1.32288
 peak( 6) x=  2118.963  sigma=   1.41421
 peak( 7) x=  2501.279  sigma=   1.58114
 peak( 8) x=  2884.628  sigma=   1.58114
 peak( 9) x=  3268.355  sigma=   1.00000
 peak(10) x=  3651.581  sigma=   1.00000
 #peaks found :      10
   2   2  2.6091953E-02     0.021     10    T_F12A_R
id=   3 #bin= 4000 title=T_F12B_L
 total=   19361.    max=     602.    threshold=      30.
 peak( 1) x=   201.479  sigma=   1.33756
 peak( 2) x=   592.110  sigma=   1.32288
 peak( 3) x=   974.188  sigma=   1.25000
 peak( 4) x=  1355.576  sigma=   1.27475
 peak( 5) x=  1743.703  sigma=   1.22474
 peak( 6) x=  2127.540  sigma=   1.41421
 peak( 7) x=  2511.355  sigma=   1.41421
 peak( 8) x=  2896.159  sigma=   1.22474
 peak( 9) x=  3281.463  sigma=   1.41421
 peak(10) x=  3666.353  sigma=   1.00000
 #peaks found :      10
   3   3  2.5997803E-02     0.021     10    T_F12B_L
id=   4 #bin= 4000 title=T_F12B_R
 total=   19361.    max=     629.    threshold=      31.
 peak( 1) x=   179.296  sigma=   1.19924
 peak( 2) x=   573.109  sigma=   1.35785
 peak( 3) x=   960.869  sigma=   1.27475
 peak( 4) x=  1346.807  sigma=   1.27475
 peak( 5) x=  1739.125  sigma=   1.32288
 peak( 6) x=  2127.793  sigma=   1.00000
 peak( 7) x=  2516.370  sigma=   1.22474
 peak( 8) x=  2905.811  sigma=   1.73205
 peak( 9) x=  3295.592  sigma=   1.00000
 peak(10) x=  3684.863  sigma=   1.41421
 #peaks found :      10
   4   4  2.5686512E-02     0.017     10    T_F12B_R
id=   5 #bin= 4000 title=T_dEL
 total=   19361.    max=     634.    threshold=      32.
 peak( 1) x=   179.716  sigma=   1.36072
 peak( 2) x=   566.941  sigma=   1.34629
 peak( 3) x=   947.795  sigma=   1.19896
 peak( 4) x=  1328.300  sigma=   1.27475
 peak( 5) x=  1715.486  sigma=   1.32288
 peak( 6) x=  2098.551  sigma=   1.22474
 peak( 7) x=  2481.208  sigma=   1.22474
 peak( 8) x=  2864.087  sigma=   1.22474
 peak( 9) x=  3248.977  sigma=   1.73205
 peak(10) x=  3632.510  sigma=   1.00000
 #peaks found :      10
   5   5  2.6078086E-02     0.015     10    T_dEL
id=   6 #bin= 4000 title=T_dER
 total=   19361.    max=     680.    threshold=      34.
 peak( 1) x=   196.601  sigma=   1.29150
 peak( 2) x=   575.477  sigma=   1.25000
 peak( 3) x=   947.820  sigma=   1.19896
 peak( 4) x=  1319.383  sigma=   1.17260
 peak( 5) x=  1697.526  sigma=   1.22474
 peak( 6) x=  2071.657  sigma=   1.41421
 peak( 7) x=  2445.628  sigma=   1.22474
 peak( 8) x=  2820.487  sigma=   1.22474
 peak( 9) x=  3195.834  sigma=   1.41421
 peak(10) x=  3570.674  sigma=   1.00000
 #peaks found :      10
   6   6  2.6688047E-02     0.016     10    T_dER
id=   7 #bin= 4000 title=T_F3
 total=   19362.    max=     681.    threshold=      30.
 peak( 1) x=   197.870  sigma=   1.32288
 peak( 2) x=   577.526  sigma=   1.27475
 peak( 3) x=   952.855  sigma=   1.22474
 peak( 4) x=  1326.957  sigma=   1.22474
 peak( 5) x=  1707.691  sigma=   1.22474
 peak( 6) x=  2084.397  sigma=   1.22474
 peak( 7) x=  2460.809  sigma=   1.22474
 peak( 8) x=  2838.247  sigma=   1.00000
 peak( 9) x=  3215.944  sigma=   1.00000
 peak(10) x=  3592.958  sigma=   1.00000
 #peaks found :      10
   7   7  2.6511479E-02     0.013     10    T_F3
id=   8 #bin= 4000 title=T_F7
 total=   19361.    max=     656.    threshold=      33.
 peak( 1) x=   179.227  sigma=   1.36931
 peak( 2) x=   568.007  sigma=   1.32288
 peak( 3) x=   940.196  sigma=   1.17260
 peak( 4) x=  1310.445  sigma=   1.27475
 peak( 5) x=  1785.414  sigma=   1.41421
 peak( 6) x=  2087.521  sigma=   1.00000
 peak( 7) x=  2469.230  sigma=   1.41421
 peak( 8) x=  2851.934  sigma=   1.41421
 peak( 9) x=  3235.011  sigma=   1.00000
 peak(10) x=  3617.598  sigma=   1.73205
 #peaks found :      10
   8   8  2.6154110E-02     0.014     10    T_F7

 8-samples: average=  2.6111905E-02
```

tcal.beam.txt

07

TOF (F3-A) 229p
(F7-A) 2山
(B-A) 96psec

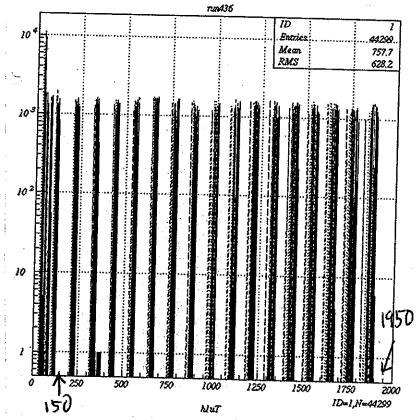
	id		slope	chi2	#peak	title
1	1	2.5683329E-02	0.020	10	T_F12A_L
2	2	2.6097953E-02	0.021	10	T_F12A_R
3	3	2.5997803E-02	0.021	10	T_F12B_L
4	4	2.5686512E-02	0.017	10	T_F12B_R
5	5	2.6076006E-02	0.015	10	T_dEL
6	6	2.6688047E-02	0.016	10	T_dER
7	7	2.6511470E-02	0.013	10	T_F3
8	8	2.6154110E-02	0.014	10	T_F7

8-samples: average= 2.6111905E-02

	id		slope	chi2	#peak	title
9	1	2.5672806E-02	0.019	10	T_F12A_L
10	2	2.6091371E-02	0.014	10	T_F12A_R
11	3	2.5991807E-02	0.015	10	T_F12B_L
12	4	2.5678437E-02	0.012	10	T_F12B_R
13	5	2.6078708E-02	0.007	10	T_dEL
14	6	2.6689185E-02	0.008	10	T_dER
15	7	2.6511487E-02	0.006	10	T_F3
16	8	2.6155261E-02	0.008	10	T_F7

8-samples: average= 2.6108632E-02

——— - ——— hod



tcal_hod.txt

ずて216本

ただし. h7down の #14ﾋﾟｰｸのやが山311

	id		slope	chi2	#peak	title
1	1	8.9852966E-02	0.220	16	h1uT
2	2	9.1457590E-02	0.197	16	h1dT
3	3	9.0585761E-02	0.183	16	h2uT
4	4	9.1429278E-02	0.154	16	h2dT
5	5	9.0420388E-02	0.229	16	h3uT
6	6	9.0385616E-02	0.184	16	h3dT
7	7	9.0494245E-02	0.225	16	h4uT
8	8	9.0658493E-02	0.130	16	h4dT
9	9	9.0968728E-02	0.226	16	h5uT
10	10	9.0967223E-02	0.206	16	h5dT
11	11	9.1202743E-02	0.199	16	h6uT
12	12	9.0778671E-02	0.157	16	h6dT
13	13	9.2265256E-02	0.212	16	h7uT
14	14	9.2695177E-02	0.181	16	h7dT

14-samples: average= 9.1011591E-02

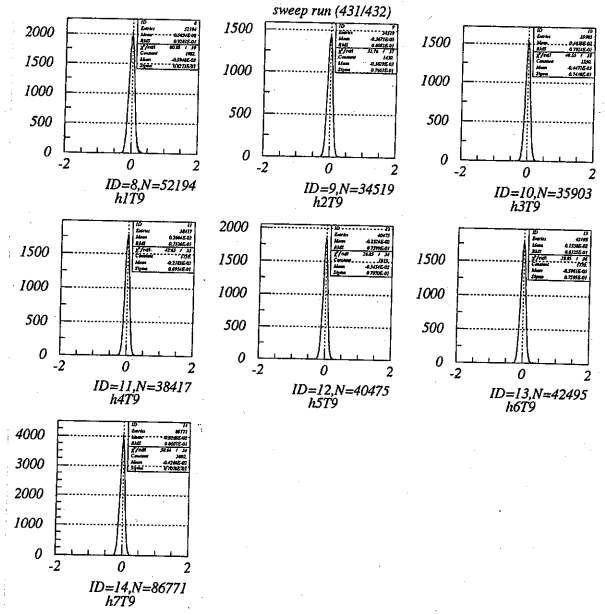
hodoscope

time calibration

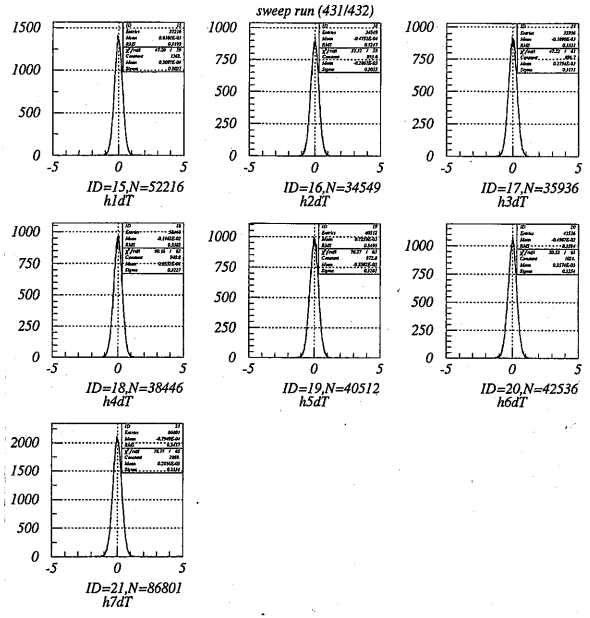
run 431/432 を用いて T0とΔTの offset あわせる.

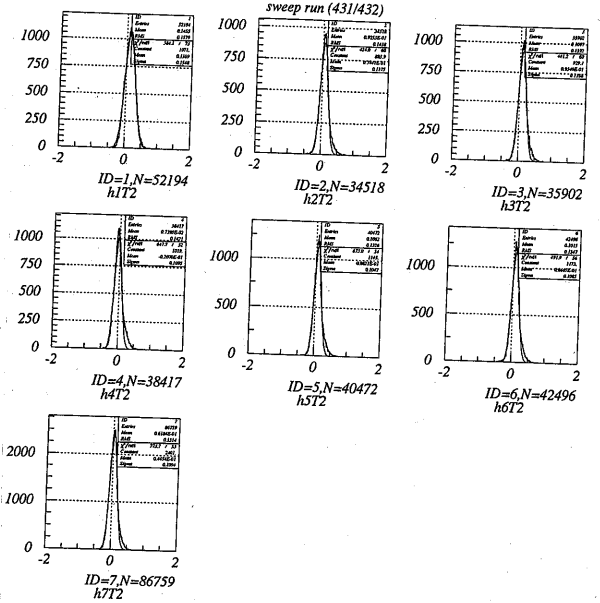
```
c GAUSFIT: Fit+- 2.0xSigma  Conv=  0.10  File=hod_tcal2_r4312.hbook
c   id        y0        <x>      sigma      d-y0     d-<x>  d-sigma  chi2 Title
     1 1071.1371    0.1369     0.1548    6.3306    0.0008   0.0008   0.07 h1T2
     2  883.8506    0.0744     0.1175    6.7567    0.0007   0.0007   0.12 h2T2
     3  929.1060    0.0935     0.1168    6.9283    0.0007   0.0007   0.12 h3T2
     4 1018.8329   -0.0207     0.1095    7.5382    0.0007   0.0007   0.24 h4T2
     5 1144.8375    0.0862     0.1047    8.1463    0.0006   0.0006   0.23 h5T2
     6 1173.2949    0.0847     0.1085    8.1177    0.0006   0.0006   0.16 h6T2
     7 2401.2261    0.0445     0.1094   11.5148    0.0004   0.0004   0.28 h7T2
     8 1981.6193   -0.0006     0.0827   11.7979    0.0004   0.0004   0.05 h1T9
     9 1429.7545   -0.0004     0.0766   10.3282    0.0005   0.0004   0.04 h2T9
    10 1530.4254   -0.0004     0.0744   10.9350    0.0005   0.0004   0.04 h3T9
    11 1758.8789   -0.0002     0.0691   12.0870    0.0004   0.0004   0.04 h4T9
    12 1815.1039   -0.0035     0.0707   12.1104    0.0004   0.0004   0.02 h5T9
    13 1769.8231   -0.0006     0.0759   11.5956    0.0004   0.0004   0.03 h6T9
    14 3892.0669   -0.0043     0.0708   17.7972    0.0003   0.0003   0.04 h7T9
    15 1362.4006    0.0001     0.3027    8.0527    0.0015   0.0015   0.01 h1dT
    16  893.7892   -0.0003     0.3035    6.5264    0.0019   0.0018   0.02 h2dT
    17  896.6896    0.0003     0.3171    6.4182    0.0019   0.0019   0.01 h3dT
    18  940.8445    0.0001     0.3227    6.5094    0.0019   0.0018   0.02 h4dT
    19  972.7864   -0.0006     0.3281    6.5487    0.0019   0.0018   0.02 h5dT
    20 1023.9729    0.0004     0.3254    6.8071    0.0018   0.0018   0.01 h6dT
    21 2069.1399    0.0000     0.3314    9.4785    0.0013   0.0012   0.02 h7dT
```

$T_{hod} - T_A$



$\sqrt{110^2 - 80^2} \sim 75$psec





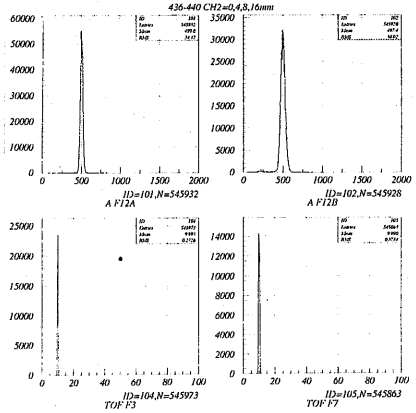
各し数を入れた。

beam run

	平行	角度	CH_2	K	
433	90mm	0°	0	0	
434	90mm	0°		0	
435	90mm	~~0°~~ 13.5°	0	0	
436	440mm	13.5°	0	1100	
437	〃	〃	4mm^t	〃	
438	〃	〃	8mm^t	〃	
439	〃	〃	16mm^t ×	〃	←カバー付
440			16mm^t	〃	

```
c
c------ bfz7.ana ------ select z=7 (beam up/dn)
c
analys
1
3
c
hst1
0, 1,1,1,3, 500,0,2000,"A F12A"
0, 1,2,2,3, 500,0,2000,"A F12B"
0, 1,2,2,15, 4000,0,100,"TOF F12B"
0, 1,5,5,15, 4000,0,100,"TOF F3"
0, 1,6,6,15, 4000,0,100,"TOF F7"
0, 3,1,7,3, 2000,0,2000,"A hod"
0, 3,1,7,9, 625,-5,20,"TOF_hod"
gate
1, 1,1,1,3, 440,560      ← A_A
2, 1,2,2,3, 400,600      ← A_B
3, 1,5,5,15, 9.0,11.0    ← TF3   run で変化
4, 1,6,6,15, 9.0,11.0    ← TF7
11, 3,1,7,3, 940,1100
X12, 3,1,7,9, -0.3,0.5   ← run で変化
and                        実は不用
13, 1,2,3,4
14, 11,12
15, 13,14
stop
-15
c
hst1
0, 1,1,1,3, 500,0,2000,"A F12A g"
0, 1,2,2,3, 500,0,2000,"A F12B g"
0, 1,2,2,15, 500,0,20,"TOF F12B g"
0, 1,5,5,15, 500,0,20,"TOF F3 g"
0, 1,6,6,15, 500,0,20,"TOF F7 g"
0, 3,1,7,3, 2000,0,2000,"A hod"
0, 3,1,7,9, 625,-5,20,"TOF_hod"
c
exit
```

bfz7.ana



TOF(B-A) 96psec

T(F3-A) 228psec

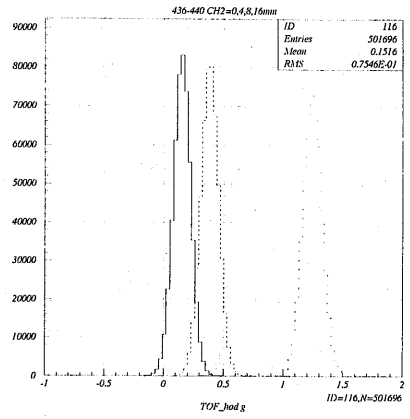
T(F7-A) 2山

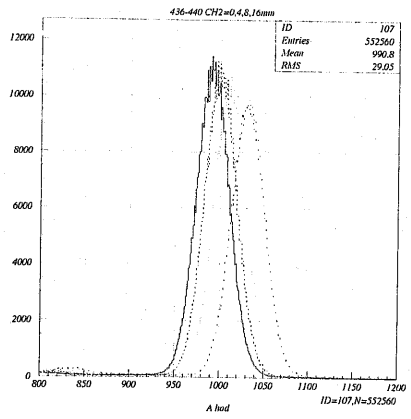
T(F7-h) 13~~5~~psec

$\sigma_\beta = 0.0016$~~8~~ @ $\beta = 0.6$ 265 ~~28~~ $\times 10^{-3}$

$\sigma_z = \frac{0.112}{0.107} \times \frac{\eta}{7.259} = \frac{0.11}{0.10}$ 0.5968

TOF_hod_ch2.pdf bfz7.ana





A_hod であるく gate をかけたもの

bg はほとんどない。

運動量の分離より良い！

beam trig では、$\sigma = 70 \sim 83$ ps

平均 74 psec

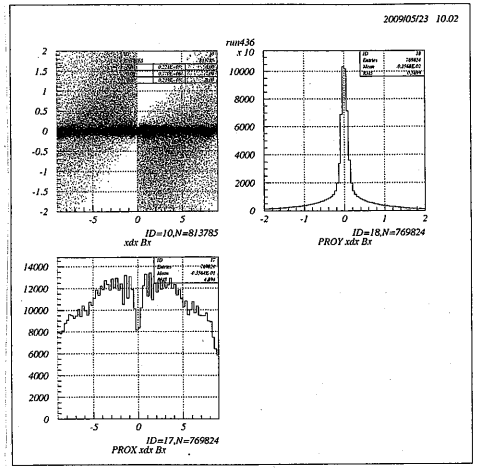
377 beam trig (Z_B Z_F=1) での δ_x

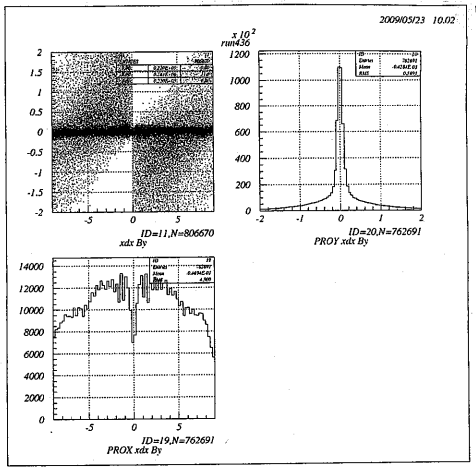
stc_r436/*.stc

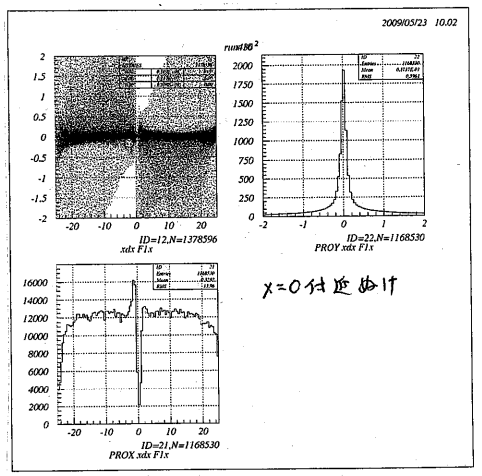
1800 ~ 2298, 975 ~ 2339 1500 ~ 2213 1450 ~ 2269

xdx_bf1_R436.ana xdxbf1R436_R436.hbook

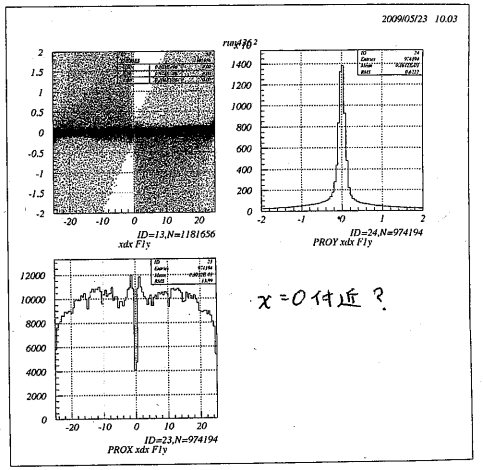
.pdf



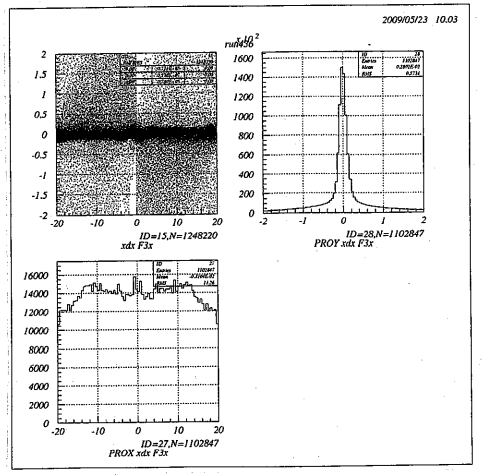


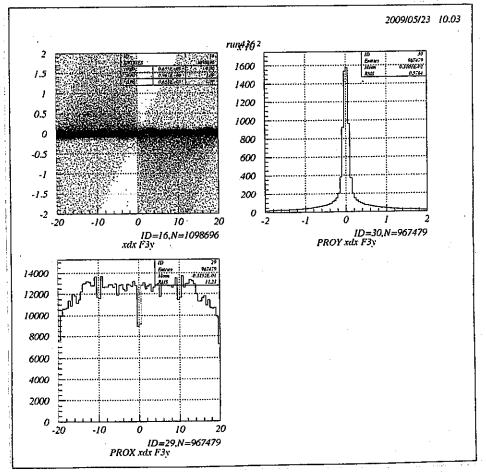


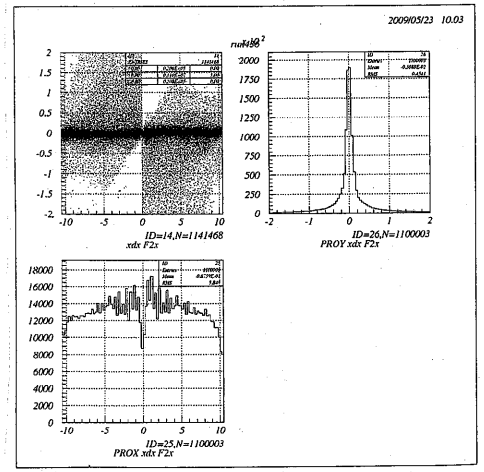
x=0付近ぬけ



x=0付近？

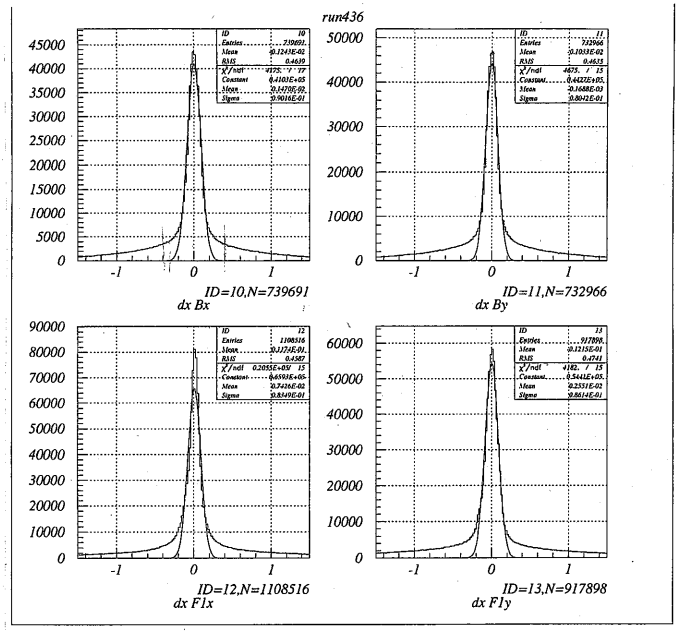




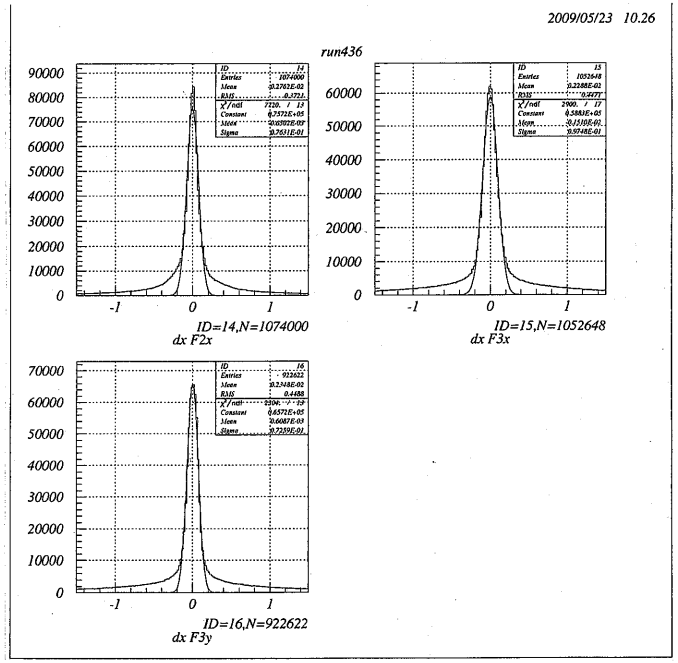


dx_7436.hbook
.pdf

残差分布



← 2 Gaus fitにした方がよい.



σ_x [mm]

1041034.5273	0.0015	0.0902	83.8123	0.0001	0.0001	14.45	dx Bx
1144272.1992	-0.0002	0.0804	92.5564	0.0001	0.0001	20.78	dx By
1265933.8125	0.0074	0.0835	116.8942	0.0001	0.0001	91.35	dx F1x
1354414.9023	0.0026	0.0861	98.9663	0.0001	0.0001	18.59	dx F1y
1475721.6875	-0.0007	0.0763	126.0383	0.0001	0.0001	45.68	dx F2x
1558830.6836	-0.0015	0.0975	96.1886	0.0001	0.0001	10.03	dx F3x
1665717.7969	0.0006	0.0726	115.2270	0.0001	0.0001	13.63	dx F3y

次分解能.

{ 4面等間隔
{ 5面等間隔

$$\chi^2 = \sum \frac{(y_i - \bar{y}_i)^2}{\sigma_i^2}$$

$$\chi_{ndf}^2 = \frac{\chi^2}{ndf}$$

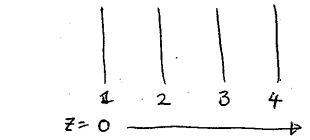
$n = 4 - 2 = 2$ 自由度2のχ^2分布 (自由度こうりはいる)

$$\chi_2 = \frac{\chi}{n}$$

$$f(\chi^2) = \frac{1}{2\Gamma(1)} e^{-\frac{\chi^2}{2}} = \frac{1}{2\Gamma(1)} \exp\left\{-\frac{(\sigma\chi_2)^2}{\sigma^2}\right\}$$

$$b = \frac{1}{\sigma^2} \qquad \frac{\Delta\sigma}{\sigma} = \frac{1}{2}\frac{\Delta b}{b} \qquad \sigma = \frac{1}{\sqrt{b}} \longrightarrow \chi^2_{ndf}$$

4面等カニカク



$$\Delta a_0 = \sqrt{\frac{7}{10}}\Delta x$$

$$\Delta a_1 = \frac{1}{\sqrt{5}}\frac{\Delta x}{L}$$

$\Delta\gamma_i$ $\sqrt{\frac{3}{10}}$ $\sqrt{\frac{7}{10}}$ $\sqrt{\frac{7}{10}}$ $\sqrt{\frac{3}{10}}$ Δx

Δx; 面当りの分解能

すべて加え合わせると?

自由度 n の χ^2 分布

$$f(\chi^2) = \frac{1}{2^{\frac{n}{2}}\Gamma\left(\frac{n}{2}\right)} \left(\frac{\chi^2}{2}\right)^{\frac{n}{2}-1} e^{-\frac{\chi^2}{2}} \qquad \chi^2 = \sum \frac{(y_i-\bar{y}_i)^2}{\sigma_i^2} = \frac{1}{\sigma^2}\sum (y_i-\bar{y}_i)^2$$

$n=1$　3-2=1　(3面)

$$f_1(\chi^2) = \frac{1}{2^{\frac{1}{2}}\Gamma\left(\frac{1}{2}\right)} \left(\frac{\chi^2}{2}\right)^{-\frac{1}{2}} e^{-\frac{\chi^2}{2}} \propto \frac{1}{\sqrt{\chi_1^2}} e^{-\frac{\chi_1^2}{2}} \propto \frac{1}{\sqrt{\chi^2}} e^{-\frac{\chi^2}{2\sigma^2}}$$

$\chi_1 = \frac{\chi}{1} = \chi$　　$\sigma^2\chi_1^2 = \chi_1^2$

$n=2$　4-2=2　(4面)

$$f_2(\chi^2) = \frac{1}{2^1\Gamma(1)} \left(\frac{\chi^2}{2}\right)^0 e^{-\frac{\chi^2}{2}} \propto e^{-\chi_2^2} \propto e^{-\frac{\chi_2^2}{\sigma^2}}$$

$\chi_2 = \frac{\chi^2}{2}$　　$\sigma^2\chi_2^2 = \chi_2^2$

$n=3$　5-2=3　(5面)

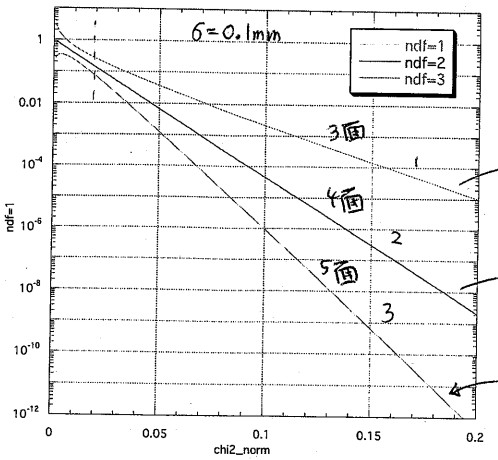
$$f_3(\chi^2) = \frac{1}{2^{\frac{3}{2}}\Gamma\left(\frac{3}{2}\right)} \left(\frac{\chi^2}{2}\right)^{\left(\frac{3}{2}-1\right)^{\frac{1}{2}}} e^{-\frac{\chi^2}{2}} \propto \left(\frac{3}{2}\chi_3^2\right)^{\frac{1}{2}} e^{-\frac{3}{2}\chi_3^2} \propto \sqrt{\chi_3^2}\, e^{-\frac{\chi_3^2}{\frac{2}{3}\sigma^2}}$$

$\chi_3^2 = \frac{\chi^2}{3}$　　$\chi^2 = 3\chi_3^2$　　$\sigma^2\chi_3^2 = \chi_3^2$

χ は χ^2

$n=1$	$g(x) = \frac{a}{\sqrt{x}} e^{-bx}$	$b = \frac{1}{2\sigma^2}$	3面	$\sigma = \frac{1}{\sqrt{2b}}$
$n=2$	$a e^{-bx}$	$b = \frac{1}{\sigma^2}$	4面	$\sigma = \frac{1}{\sqrt{b}}$
$n=3$	$\sqrt{x}\, a e^{-bx}$	$b = \frac{3}{2\sigma^2}$	5面	$\sigma = \frac{1}{\sqrt{\frac{2b}{3}}}$

~~まず全面 hit の場合。~~



$e^{-53.24}$　$\sigma = \frac{1}{\sqrt{53.24\times 2}} \sim 0.1$

$e^{-100\chi}$　$\sigma = \frac{1}{\sqrt{100}} = \frac{1}{10} = 0.1$ ok

$\sigma = e^{-146\chi}$　$\sigma = \frac{1}{\sqrt{146\times\frac{2}{3}}} \sim 0.1$

近似的には 指数で fit してよい。

fit の routine は 作っておくこと　⟶ paw でも

全面 hit の場合の chisq 分布

$$f_3(\chi) = \sqrt{\chi}\, e^{-b\chi} = \chi^{\frac{1}{2}} e^{-b\chi}$$

$$f_3'(\chi) = \frac{1}{2}\chi^{-\frac{1}{2}} e^{-b\chi} + \chi^{\frac{1}{2}}(-b) e^{-b\chi} = \chi^{\frac{1}{2}} e^{-b\chi}\left\{\frac{1}{2}\chi^{-1} - b\right\} = 0 \qquad \frac{1}{2\chi} = b$$

$\chi = \frac{1}{2b} = \frac{1}{2}\frac{2\sigma^2}{3} = \frac{\sigma^2}{3}$

$\chi_{max} = 0.314\times10^{-2} = 0.00314$　だいたい 0.02まで　　$\sigma = \sqrt{3\chi_{max}} = 0.097$　　$\sigma \sim 97\,\mu m$

0.05～0.2を fit　$b = 17.84$

等間隔

3面 $\Delta a_0 = \sqrt{\frac{5}{6}}\Delta x$ $\Delta a_1 = \frac{1}{\sqrt{2}}\frac{\Delta x}{L}$

$\sqrt{\frac{1}{6}}\Delta x$ $\sqrt{\frac{4}{6}}\Delta x$ $\sqrt{\frac{1}{6}}\Delta x$ $\sqrt{\frac{1}{6}}$ $\sqrt{\frac{4}{6}}\sqrt{\frac{1}{6}}\Delta x$

4面 $\sqrt{\frac{7}{10}}\Delta x$ $\frac{1}{\sqrt{5}}\frac{\Delta x}{L}$ $\sqrt{\frac{3}{10}}$ $\sqrt{\frac{7}{10}}$ $\sqrt{\frac{7}{10}}\sqrt{\frac{3}{10}}$

5面 $\sqrt{\frac{3}{5}}\Delta x$ $\frac{1}{\sqrt{10}}\frac{\Delta x}{L}$ $\sqrt{\frac{4}{10}}$ $\sqrt{\frac{7}{10}}$ $\sqrt{\frac{8}{10}}$ $\sqrt{\frac{7}{10}}\sqrt{\frac{4}{10}}$

残差分布を重ねて plot

3面 $\frac{1}{3}\sqrt{\frac{1+4+1}{6}}\Delta x = \frac{\Delta x}{3} = 0.33\Delta x$

4面 $\frac{1}{4}\sqrt{\frac{3+7+7+3}{10}}\Delta x = \frac{\sqrt{2}}{4}\Delta x = \frac{\Delta x}{2.83} = 0.35\Delta x$

5面 $\frac{1}{5}\sqrt{\frac{4+7+8+7+4}{10}}\Delta x = \frac{\Delta x}{2.89} = 0.35\Delta x$

この予想 まちがい???

σ=0.1mmで simulation

① 3面.

加えたものは Gaussになるはず

$\sigma = 0.0539 = 0.539 \times 0.1\text{mm}$

② 4面

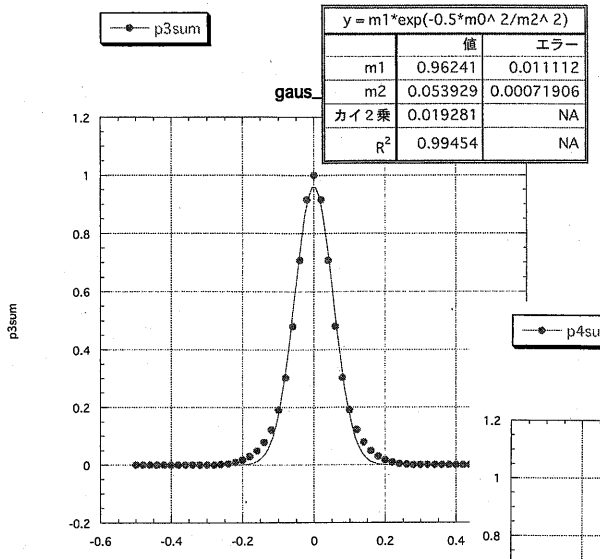
$\sigma = 0.0693 = 0.693 \times 0.1\text{mm}$

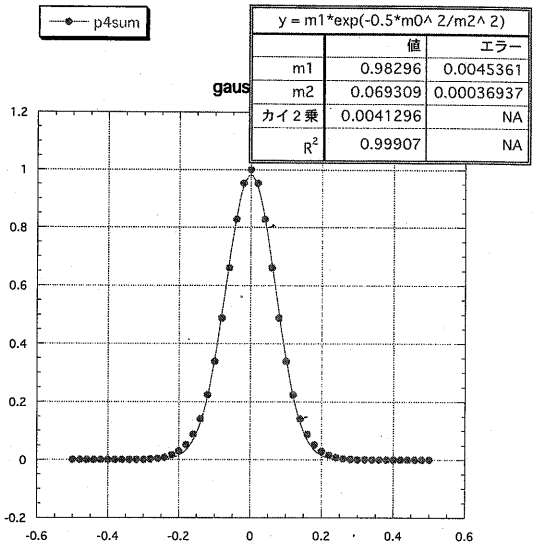
③ 5面

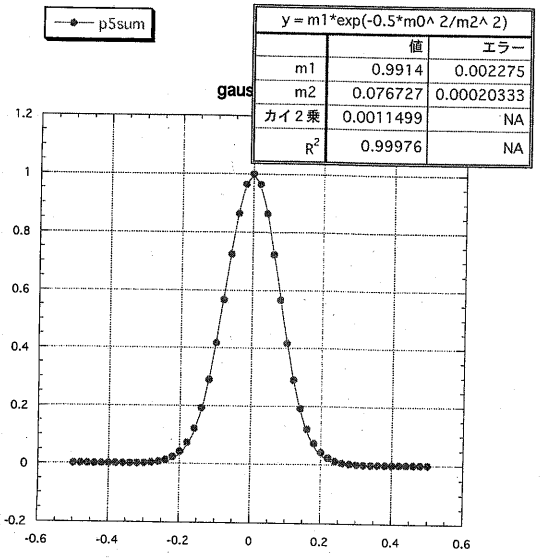
$\sigma = 0.07693 = 0.7693 \times 0.1\text{mm}$

	σ_{obs}		σ_{plane} [μm]	3σ	2.5σ
bx	90.2		118	0.35	0.295
by	80.4		105	0.32	0.263
F1x	83.5	→ スケール	120	0.36	~~0.36~~ 0.30
F1Y	86.1		124	0.39	0.31
F2x	76.3		110	0.33	0.275
F3x	97.5		127	0.38	0.318
F3Y	72.6		105	0.32	0.263

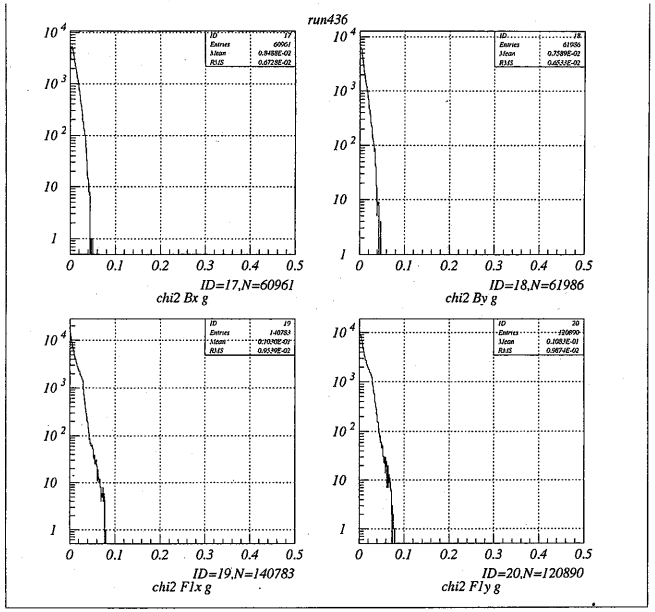
σ=0.1mm







残差分布の±0.2mmにgateをかけて χ^2 分布を見る。 chi2bf7r436.ana

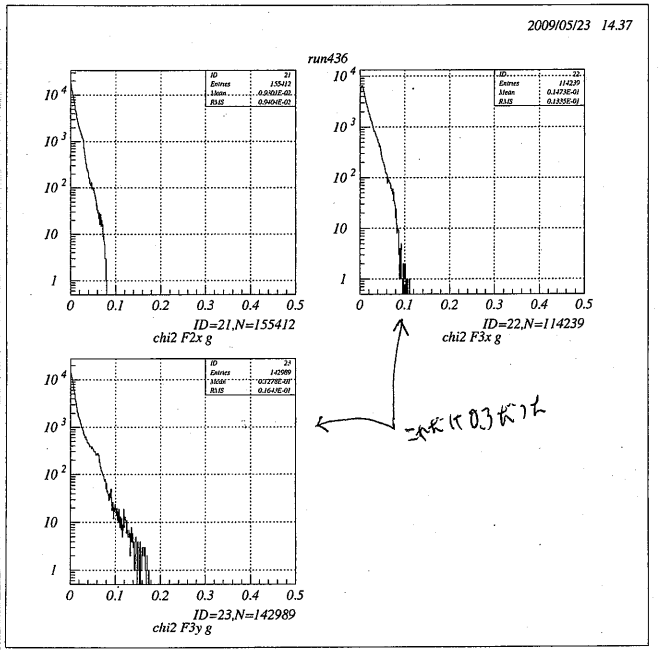


±0.2mm

chi2bf7r436_cutpm02.hbook

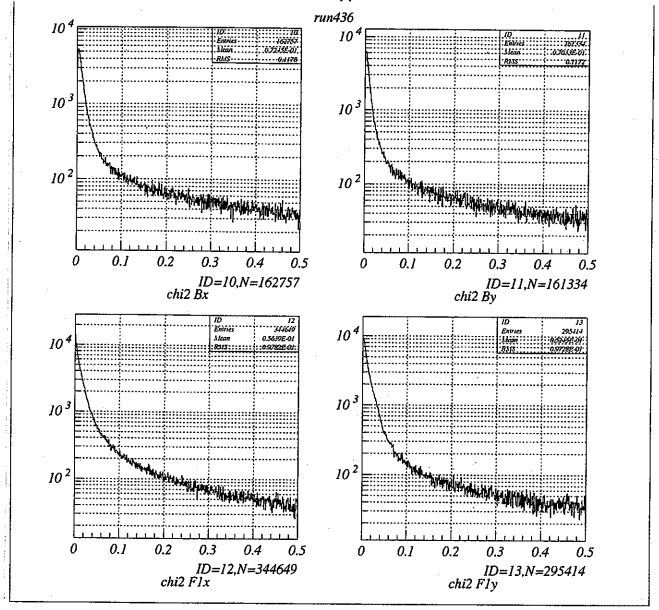
切りcutがきつすぎる。

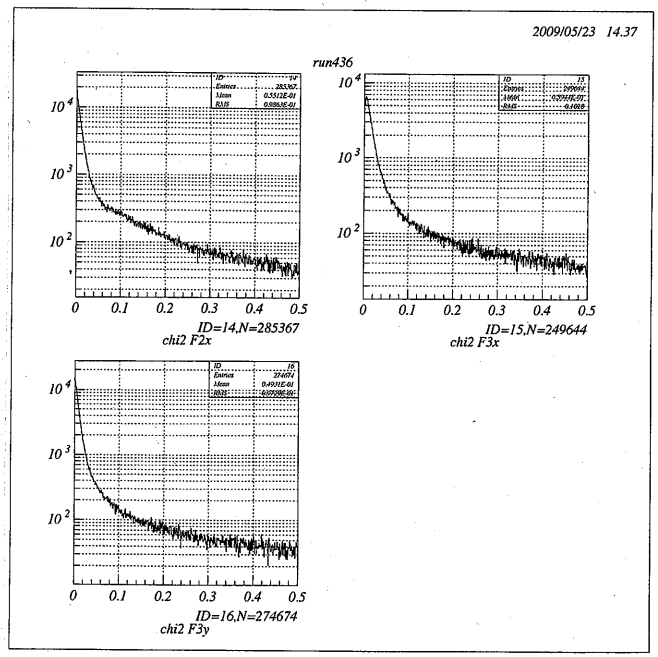
cut=±0.2mm 切りcutがきつすぎる。

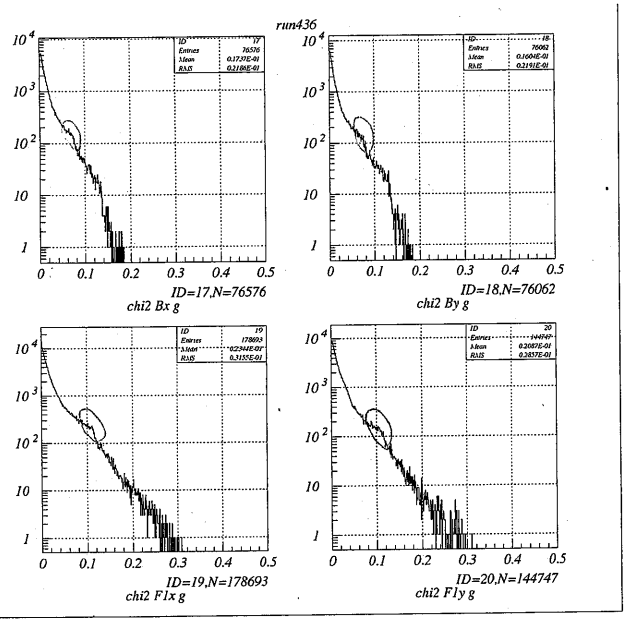


dXにcutなし r436

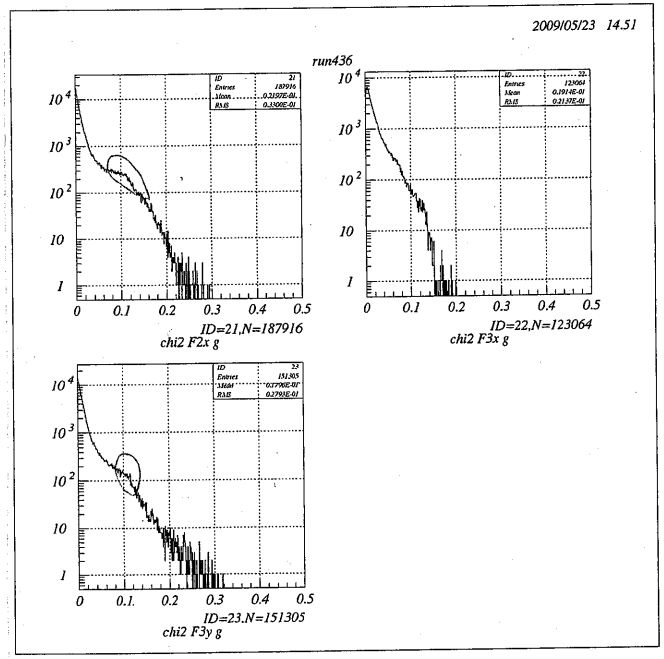
$z_b = z_f = 7$



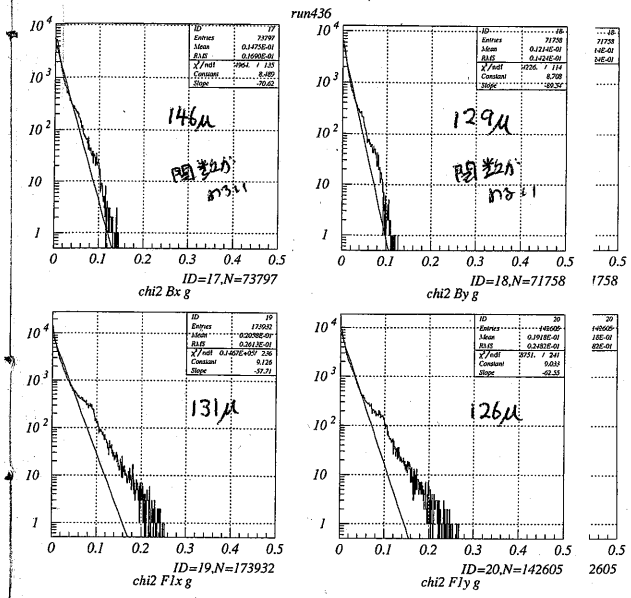




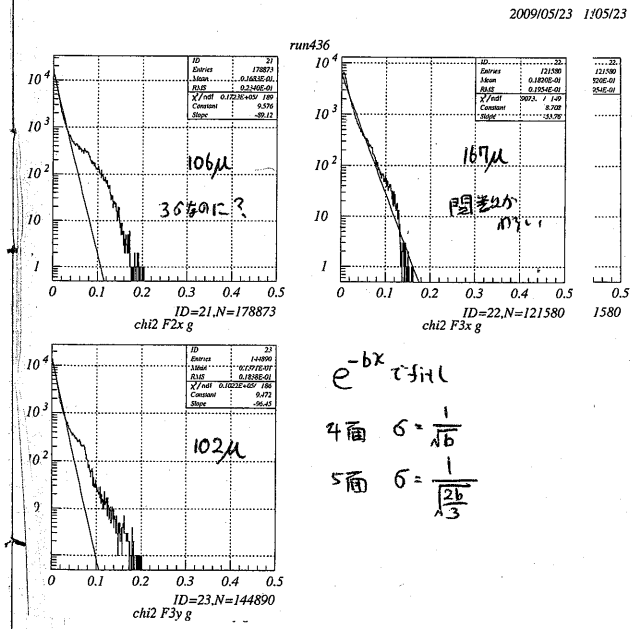
cut = ±0.4mm → cutが ゆるい ?



P83で 求めた Oplane の 31番 0.35 0.36 0.33 0.38
0.32 0.31 0.32



±36 まだ ゆるい ?

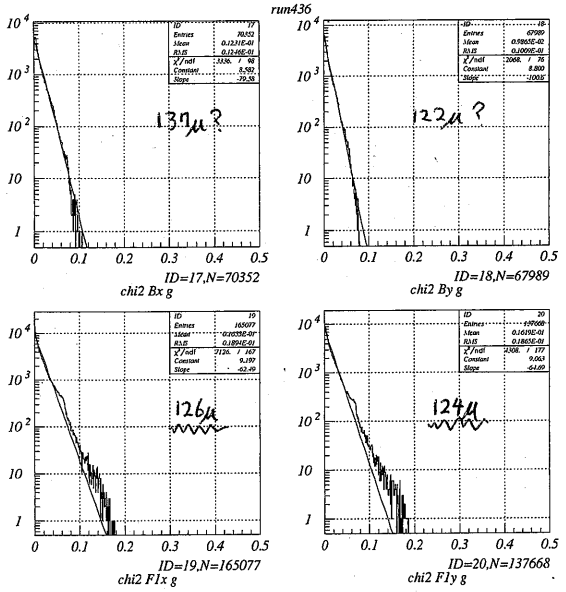


e^{-bx} で fitL

4面 $\sigma = \frac{1}{\sqrt{b}}$

5面 $\sigma = \frac{1}{\sqrt{\frac{2b}{3}}}$

±256cutでやってみる → うまうと良いくらい。



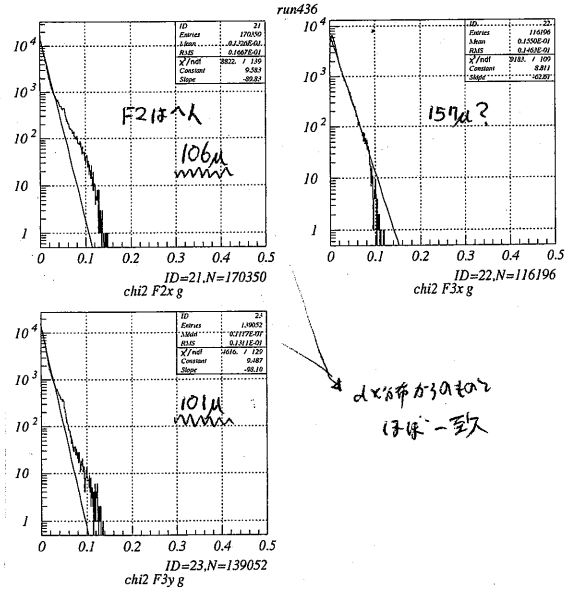
±2.5σ cutの時の残差分布 →

← dx分布から求めたものと一致

±2.5σ

σ = σplane ← これはdx分布からスケールして求めた。

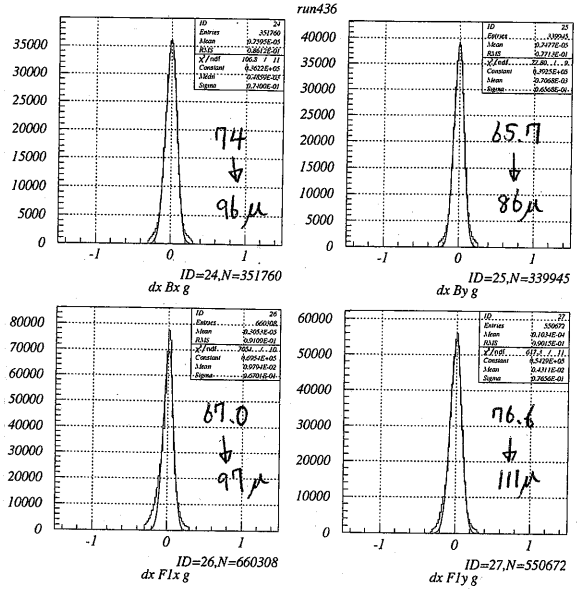
2009/05/23 1



※ただし±2.5σ cutでは半分くらいすてている。
↓
回復する必要あり

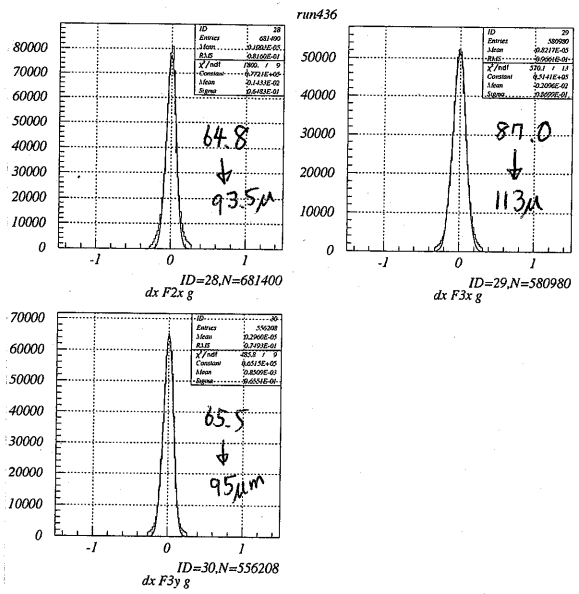
dx分布からのものとほぼ一致

~~任意の関数のfitting fragramを作る~~



dx分布 ±2.5σ cutの積で自分を見る。
↓
当然せまくなるで。

2009/05/23 1.



Paw++ fit opt logy

7.6.5 Fitting histograms

The general syntax of the command to fit histograms is:

HISTOGRAM id func [chopt np par step pmin pmax errpar]

Only the parameters, which are of more general use, are described in detail. The full description can be found in part 3 of this manual.

ID — A histogram identifier (1-dim or 2-dim)
A bin range may be specified, e.g. `Histo/Fit 10(25:56) ...`

FUNC — Name of a function to be fitted to the histogram.
This function can be of various forms:

1 The name of a file which contains the user defined function to be minimized. Function name and file name must be the same. For example file FUNC.FOR is:

```
FUNCTION FUNC(X)   or FUNC(X,Y) for a 2-Dim histogram
COMMON/PAWPAR/PAR(2)
FUNC=PAR(1)*X +PAR(2)*EXP(-X)
END
```

2 One of the keywords below (**1-dim histograms only**), which will use the parameterization described at the right for the fit.

- G Func=par(1)*exp(-0.5*((x-par(2))/par(3))**2)
- E Func=exp(par(1)+par(2)*x)
- Pn Func=par(1)+par(2)*x+par(3)*x**2...+par(n+1)*x**n, 0<n<20

3 A combination of the keywords above with the 2 operators + or *.

Note that in this case, the order of parameters in PAR must correspond to the order of the basic functions. Blanks are not allowed in the expression.

CHOPT — All options of the HISTO/PLOT command plus the following additional ones:

- O Do not plot the result of the fit. By default the fitted function is drawn unless the option "N" below is specified.
- B Some or all parameters are bounded. In this case vectors STEP,PMIN,PMAX must be specified. Default is: All parameters vary freely.
- D The user is assumed to compute derivatives analytically using routine HDERIV. By default, derivatives are computed numerically.
- L Use Log Likelihood method. Default is χ^2 method.
- M Invokes interactive Minuit (See on Page 280)
- N Do not st ore the result of the fit bin by bin with the histogram. By default the function is calculated at the centre of each bin and the fit results stored with the histogram data structure.
- Q Quiet mode. No output printed about the fit.
- V Verbose mode. Results are printed after each iteration. By default only final results are printed.
- W Sets weights equal to 1.

NP — Number of parameters in fit ($0 \leq$ NP ≤ 34)

PAR — Vector containing the fit parameters.
Before the fit: Vector containing the initial values
After the fit: Vector containing the fitted values.

STEP — Vector with step size for fit parameters

PMIN — Vector with lower bounds for fit parameters

PMAX — Vector with upper bounds for fit parameters

ERRPAR — Vector with errors on the fitted parameters

When using predefined functions (case 2 for the FUNC parameter) initial values need not be specified when NP=0. In this case the parameter vector PAR, if specified, is only filled with the fitted parameters on **output**.

func_P5.f

```
function func_P5(x)
common/pawpar/par(10)
func_p5 = par(1)*sqrt(x)*exp(-par(2)*x)
END
```

Ve/cr par(2) R 30000 200

opt stat
opt fit
set fit 111

Ve/cr Par(2)
Ve/in par(2) 30000 200
hi/fit id func_P5.f ! 2 par
id(a.0:b.0)

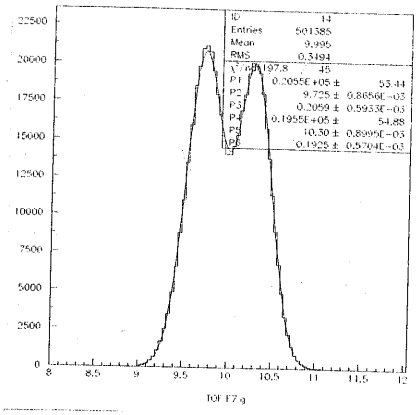
ve/pr par(1:2)
h/plot id sFUNC

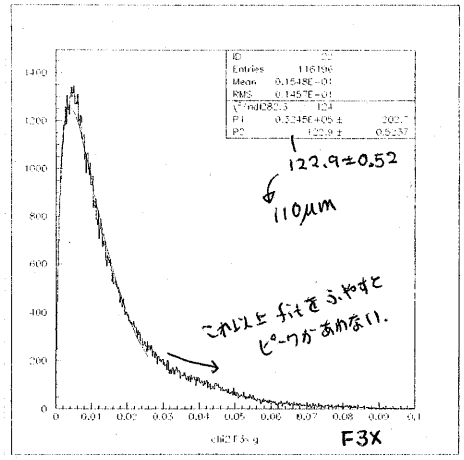
h/fit id(a:b) G ! 0 par ?
G 0 0 par(4) ?
G+G ! 6 par2 ?

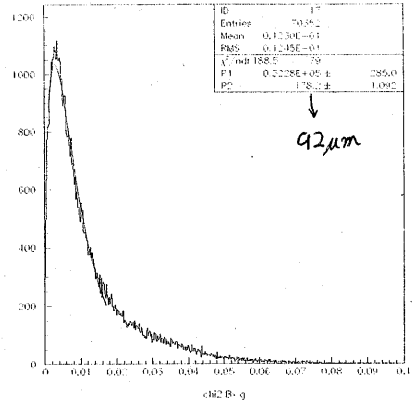
h/fit 24 G ' ' 0 par2 ← ok

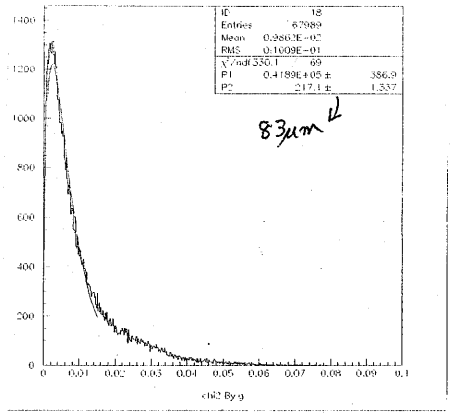
func_gaus2c.f

$$p1\, e^{-\frac{(x-p2)^2}{2(p3)^2}} + p4 \quad \overline{p5}$$









$$\frac{1}{\sqrt{123\times\frac{2}{3}}} = 0.110\ \mathrm{mm}$$

面当りの分解能

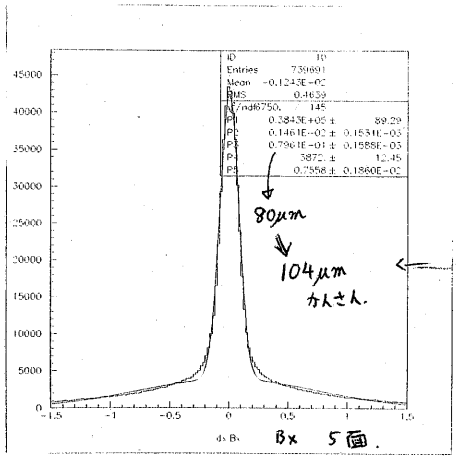
Bx	92μ
By	83μ
F1X	126μ
F1Y	124μ
F2	106μ
F3X	110μ
F3Y	101μ

) 少しかえる!?

tail がある
ここに P5では 0.02<5μまでしか fitできない

—— - —— 2成分 fit

$$P1\, e^{-\frac{1}{2}\left(\frac{X-P2}{P3}\right)^2} + P4\, e^{-\frac{1}{2}\left(\frac{X-P2}{P5}\right)^2}$$



—— · —— 次は? TDCのcut

X^2で cutする?
cutの位置は?

analyzer でなく.

4面

$$f = f_0 e^{-bx} \qquad b = \frac{1}{\sigma^2}$$

$$\int_0^\infty f_0 e^{-bx}dx = \left[\frac{f_0}{-b}e^{-bx}\right]_0^\infty = -\frac{f_0}{-b} = 1 \qquad f_0 = b$$

$$\int_0^x b e^{-bx}dx = \left[\frac{b}{-b}e^{-bx}\right]_0^x = -e^{-bx} - (-1) = 1 - e^{-bx} = f_0 \qquad \begin{matrix}0.9\\0.8\\\vdots\end{matrix}$$

95% 26
99% 2.66

95% $e^{-bx} = 1-0.95 = 0.05$

$-bx = \ln 0.05$

$x = \frac{\ln 0.05}{b} = \sigma^2|\ln 0.05| = 0.1\mathrm{mm}^2|\ln 0.05| = 0.03$

99% $\sigma^2|\ln 0.01| = 0.046$

3面fil

$f(x) = \frac{a}{\sqrt{x}} e^{-bx}$ $\quad b = \frac{1}{2\sigma^2}$ $\quad x^{-\frac{1}{2}} e^{-bx}$

$-\frac{1}{2} x^{-\frac{3}{2}}$ $\quad (x^{\frac{1}{2}})' = \frac{1}{2} x^{-\frac{1}{2}}$

$\sigma = \frac{0.05\text{mm}}{b}$

0.095
0.09
0.10mm
0.125mm
0.15mm
0.175mm
0.20mm

$$\int_{-\infty}^{\infty} e^{-\frac{x^2}{b^2}} dx = \sqrt{\pi} b$$

$$\int_{-\infty}^{\infty} x^2 e^{-\frac{x^2}{b^2}} dx = \sqrt{\pi} b^3$$

$$\int_0^{\infty} \frac{e^{-bx}}{\sqrt{x}} dx = \int_0^{\infty} \frac{e^{-by^2}}{y} 2y\,dy = \int_0^{\infty} 2e^{-by^2} dy = \int_{-\infty}^{\infty} e^{-by^2} dy = \sqrt{\pi} \frac{1}{\sqrt{b}}$$

$x = y^2 \quad dx = 2y\,dy$

$$\int_{-\infty}^{\infty} e^{-ax^2} dx = \left(\frac{\pi}{a}\right)^{\frac{1}{2}} = \sqrt{\pi} a^{-\frac{1}{2}}$$

$$\int_{-\infty}^{\infty} (-x^2) e^{-ax^2} dx = (\pi)^{\frac{1}{2}} \left(-\frac{1}{2}\right) a^{-\frac{3}{2}}$$

$$\int_{-\infty}^{\infty} x^2 e^{-ax^2} dx = \frac{\sqrt{\pi}}{2} \frac{1}{a^{\frac{3}{2}}}$$

$$\int_{-\infty}^{\infty} \frac{1}{\sqrt{2\pi}\sigma} e^{-\frac{x^2}{2\sigma^2}} dx = 1$$

$\pm 2\sigma$	95.5%
$\pm 3\sigma$	99.7%
$\pm 1.96\sigma$	95%
$\pm 2.586\sigma$	99%
$\pm\sigma$	68%

± 1.64 90%

$$f(x) = \sqrt{\frac{b}{\pi}} \frac{1}{\sqrt{x}} e^{-bx}$$ 規格化後

$$\int_0^x f(x)\,dx = \sqrt{\frac{b}{\pi}} \int_0^x \frac{e^{-bt}}{\sqrt{t}} dt = \sqrt{\frac{b}{\pi}} \int_0^{x^2} \frac{e^{-by^2}}{y} 2y\,dy = 2\sqrt{\frac{b}{\pi}} \int_0^{x^2} e^{-by^2} dy$$

$t = y^2$
$dt = 2y\,dy$

$$\int_{-\infty}^{\infty} e^{-ax^2} dx = \sqrt{\frac{\pi}{a}}$$

$$\int_{-\infty}^{\infty} x^2 e^{-ax^2} dx = \frac{1}{2}\sqrt{\frac{\pi}{a^3}}$$

$$\int_{-\infty}^{\infty} x^{2n} e^{-ax^2} dx = \frac{(2n-1)!!}{2^{n+1}} \sqrt{\frac{\pi}{a^{2n+1}}}$$

$$\int_0^{\infty} x^{2n+1} e^{-ax^2} dx = \frac{n!}{2a^{n+1}}$$

$$\int_0^{\infty} x^{2n} e^{-ax^2} dx = \frac{1 \times 3 \times 5 \times \cdots (2n-1)}{2^{n+1}} \sqrt{\frac{\pi}{a^{2n+1}}}$$

ガウスの公式から

$$\int_{-n\sigma_0}^{+n\sigma_0} \sqrt{\frac{a}{\pi}} e^{-ax^2} dx = f$$

$$a = \frac{1}{2\sigma_0^2} \qquad \sigma_0 = \sqrt{\frac{1}{2a}}$$

n	f
1	68%
2	95.5%
2.59	99%
3	99.7%

7 χ^2分布に対するcut.

上面fitの場合 reduced χ^2 分布 $t=\chi^2=\frac{\Sigma(y_i-\bar{y}_i)^2}{n-2}$ は　　σ_0：面当りの分解能

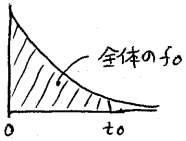
$n=4$

$f(t)=ae^{-bt}$

$t=\chi^2$

$b=\frac{1}{\sigma_0^2}$

$\int_0^\infty f(t)dt=1$ と規格化すると　　$f(t)=be^{-bt}=\frac{1}{\sigma_0^2}e^{-\frac{t}{\sigma_0^2}}$



$e^{-bt_0}=1-f_0$

$t_0=\frac{\ln(1-f_0)}{b}=\sigma_0^2\ln(1-f_0)$

$1-f_0$	t_0
90%	$2.30\sigma_0^2$
95%	$3.00\sigma_0^2$
99%	$4.61\sigma_0^2$
99.7%	$5.81\sigma_0^2$

$\sigma_0=0.1$mmの時　$t_0=0.046$

3面 fitの時

$f(t)=\frac{a}{\sqrt{t}}e^{-\frac{t}{2\sigma_0^2}}=\frac{a}{\sqrt{t}}e^{-bt}$　　$b=\frac{1}{2\sigma_0^2}$　　$\frac{1}{2b}=\sigma_0^2$

規格化する

$\int_0^\infty\frac{e^{-bt}}{\sqrt{t}}dt=\int_0^\infty\frac{e^{-by^2}}{y}2ydy=\int_0^\infty 2e^{-by^2}dy=\int_{-\infty}^\infty e^{-by^2}dy=\sqrt{\frac{\pi}{b}}$

$t=y^2$, $dt=2ydy$, $\sqrt{t}=y$

$f(t)=\sqrt{\frac{b}{\pi}}\frac{1}{\sqrt{t}}e^{-bt}=\frac{1}{\sqrt{2\pi}}\frac{1}{\sigma_0}\frac{1}{\sqrt{t}}e^{-\frac{t}{2\sigma_0^2}}$

$\int_0^{t_0}f(t)dt=\sqrt{\frac{b}{\pi}}\int_0^{t_0}\frac{e^{-bt}}{\sqrt{t}}dt=\sqrt{\frac{b}{\pi}}\int_0^{\sqrt{t_0}}\frac{e^{-by^2}}{y}2ydy=2\sqrt{\frac{b}{\pi}}\int_0^{\sqrt{t_0}}e^{-by^2}dy$

$t=y^2$

$=\sqrt{\frac{b}{\pi}}\int_{-\sqrt{t_0}}^{+\sqrt{t_0}}e^{-by^2}dy=\sqrt{\frac{b}{\pi}}\int_{-y_0}^{y_0}e^{-by^2}dy=\int_{-y_0}^{y}\sqrt{\frac{b}{\pi}}e^{-by^2}dy$

$b=\frac{1}{2\sigma^2}$ とおくと　$\sigma=\sqrt{\frac{1}{2b}}$　　$=\int_{-y_0}^{y_0}\frac{1}{\sqrt{2\pi}\sigma}e^{-\frac{y^2}{2\sigma^2}}dy$

$y=\sqrt{t}=n\sigma=n\frac{1}{\sqrt{2b}}=n\sigma_0$

t: χ^2

$t=n^2\sigma_0^2$

	y_0	tでのχ^2の値 t_0	$\sigma_0=0.1$mm
90%	1.64σ	$2.69\sigma_0^2$	0.0269
95%	1.96σ	$3.84\sigma_0^2$	0.0384
99%	2.58σ	$6.66\sigma_0^2$	0.0666
99.7%	3σ	$9\sigma_0^2$	0.09
	$n\sigma$	$(n\sigma_0)^2$	

② 5面 fitの時

reduced chi square のt.の分布は，面当りの分解能をσ_0として

$f(t)=a\sqrt{t}e^{-bt}$　　$b=\frac{1}{\frac{2}{3}\sigma_0^2}=\frac{3}{2\sigma_0^2}$

規格化

$\int_0^\infty\sqrt{t}e^{-bt}dt=\int_0^\infty 2y^2e^{-by^2}dy=\int_{-\infty}^\infty y^2e^{-by^2}dy=\frac{1}{2}\sqrt{\frac{\pi}{b^3}}$

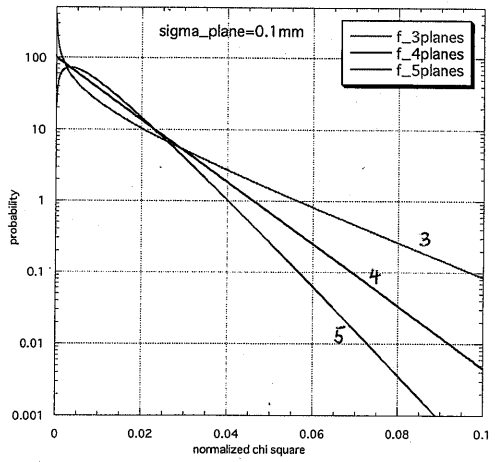
$t=y^2$, $dt=2ydy$

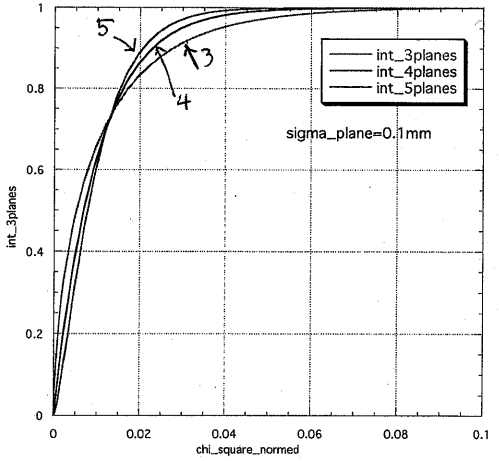
$f(t)=2\sqrt{\frac{b^3}{\pi}}\sqrt{t}e^{-bt}$　　$b=\frac{3}{2\sigma_0^2}$

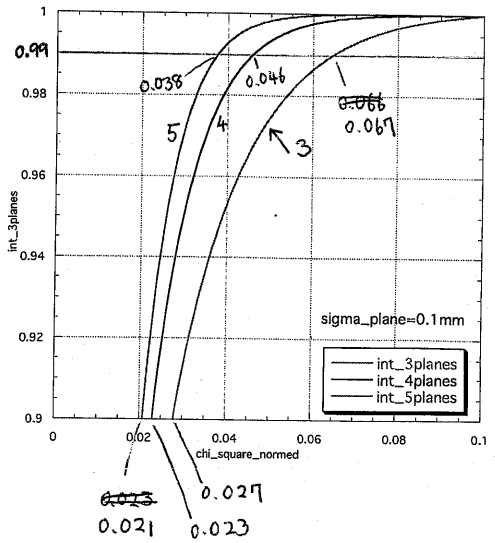
	t_0 ($\sigma_0=0.1$)	α
90%	$0.0208=\alpha\sigma_0^2$	$2.08\sigma_0^2$
95%	0.026	$2.60\sigma_0^2$
99%	0.0378	$3.78\sigma_0^2$
99.7%	0.0464	$4.64\sigma_0^2$

80%も t 必要.

chi square 分布







Δx/分布に対する

たとえば 全体の90% になるような ±nσ とれは？

95%

3面	$f^3 = 0.90$	$f = 0.9655$	$\pm 2.1\sigma$
	0.95	0.9830	2.365σ
4面	$f^4 = 0.90$	$f = 0.9740$	2.21σ
	0.95	0.9873	2.465σ
5面	$f^5 = 0.90$	0.9791	2.26σ
	0.95	0.9898	2.535σ

残差分布は、面ごとで中が異なるので、むずかしい。