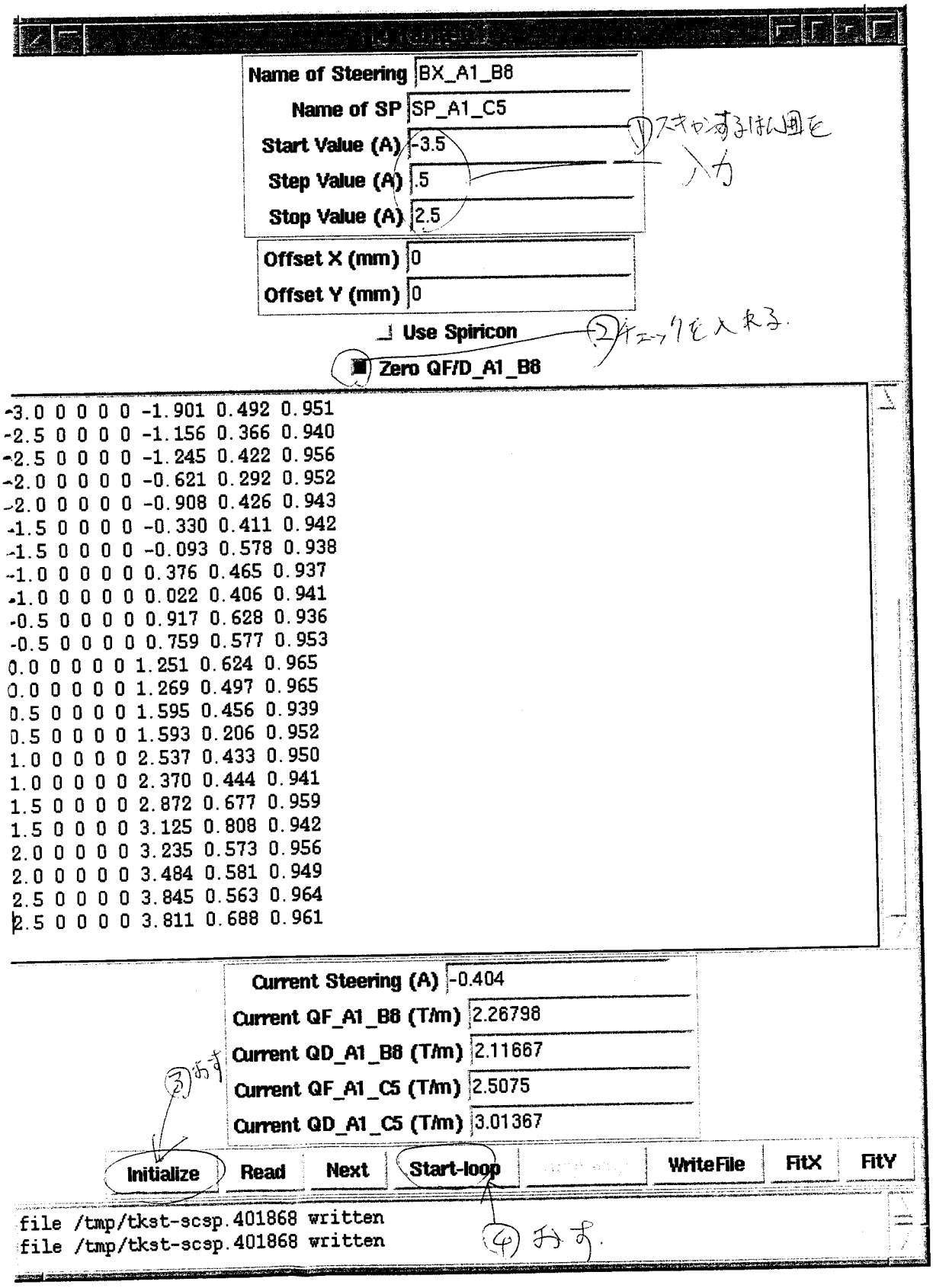
Analyzer (ST) A1



Beam View

BeamView usage, k.furukawa,
 last update Sep.25.2001.

Linac の Emittance の測定は
3 Wire Scanners
Q-scan with screen image through Spiricon
Q-scan with screen image through BeamView described below
によって行なうが、現在のところ主に BeamView を使用している。
Software について、使いにくさについてはご容赦下さい。

[[[Software 以前 (at Linac Computer Building)]]]

amplify ntsc signal by two

connect signal to Frame Grabber

start 'tvmain' on goro
 file size = 41532 in /dd/USR/BIN (hard disk)
 $ /dd/USR/BIN/tvmain

[[[前準備]]]

stop KBFrame applications (like Linac Orbit Display)
  to make colors available
  otherwise you may cannot see screen image

[[[起動]]]

start 'BeamView' on almond
 147456 Mar 10 1998 /usr/users/control/bin/BeamView
 % /usr/users/control/bin/BeamView goro

(you may use tkmenu-linac to start BeamView)

Linac の Screen を挿入し Video Display で確認する。

"TV Start" ボタンを押す

[[[長さ較正]]]

screen image の中の "田" の字の frame を mouse を使って、
 screen の 20mm x 20mm（他の大きさの場合もある）の枠に合致させる。
 (0.1mm の厚さの Almina の板の場合の Size は、
  最外枠 25mm x 33mm、枠の目盛り板の幅 2.5mm x 1.5mm、目盛り板の
  内枠 20mm x 30mm、で、それを 45 度方向から見るので、
  20mm x 21.2mm となる。)
 mouse の操作には忍耐が必要
find center of the screen
 then move center cursor to the center of the screen
find top edge of the screen
 then move top   ..... top
find bottom edge of the screen
 then move bottom ..... bottom
find left edge of the screen
 then move left   ..... left
find right edge of the screen
 then move right ..... right

"Set Scale" ボタンを押し、dialog box の中で
 select "Half width" with middle,left,right mouse button for x
  normally to 10mm
 select "Half width" with middle,left,right mouse button for y
  normally to 10mm
 "OK" ボタンを押し、dialog box を抜ける。

[[[輝度調整]]]

tune the brightness so that Yellow is maximum brightness
 using shutter speed of Random shutter camera

"This Image -> BGD" ボタンを押し、dialog box を抜ける。

さらに Noise を差し引くため、
 set height cursor to ... with left mouse button,
  and then push "Set Threshold" button

[[[半値幅測定条件]]]

put on beam

"Set Analyze Area" ボタンを押す。

set "Smooth width" with middle,left,right mouse button to 5 (or 10)

投影グラフの height を調整するため、
 set height cursor to ... with left mouse button,
  and then push "Set Height" button

"Range Analyze" ボタンを押す。

"Analyze On" ボタンを押す。

"ave./cnt" - "Up" ... to set average value to 5 or 10

[[[測定]]]

Start "Emittance Measurement (tkemitt)" using tkmenu-linac

tkemitt と BeamView は勝手に通信して情報を取る。
 が、tkemitt の Interval は 15 秒程度がお勧めです。

[[[その他]]]

"TV STOP" ボタンを押すと、休止。

"TV START" ボタンで再開。

"Quit" ボタンを押して、Dialog box に "OK" とすると終了。

"TV START" ボタンを押しても Video 画像が現れなければ、
  telnet goro
  User name?: super
  Password: superuser
  Super: resetbutton
 1 分間待って
  telnet goro
  User name?: super
  Password: superuser
  Super: procs -e
    ...
   43   0   0.0   128 218.00k   0 e   0.18   ??? tvmain <h0 >nil >>nil
    ...
  Super: kill 43
Super: load -d /h0/USR/BIN/tvmain
Super: tvmain

=====
feb.16.1999.
change several default values

=====
mar.5.1998.
shared memory communication

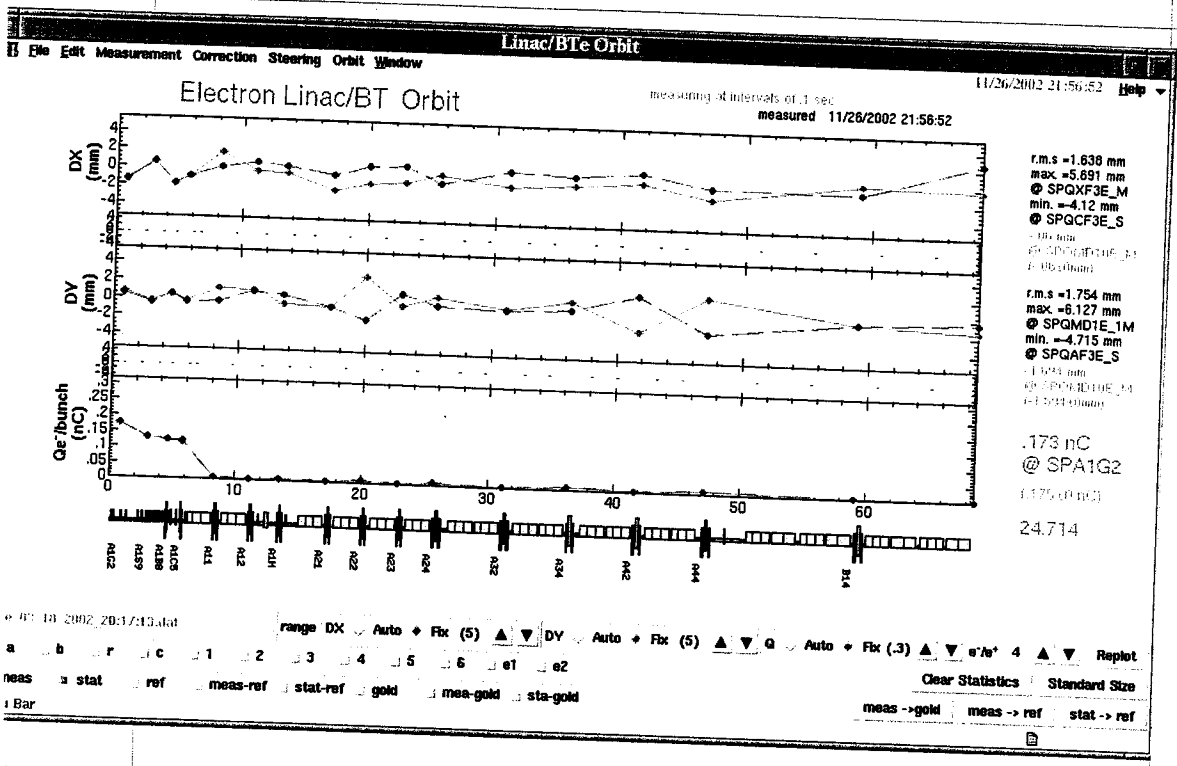
=====
oct.23.1996.
trigger with fast-amp +1.2V ---> +6V pulse

time base corrector

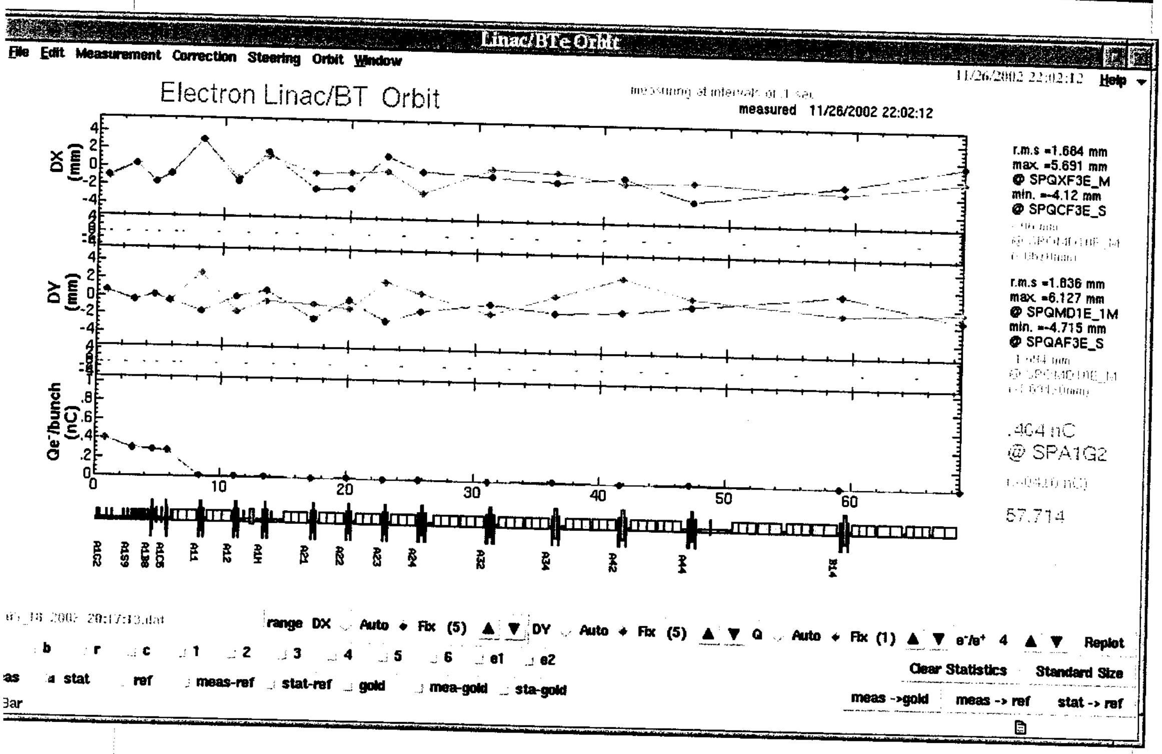
screen shift correction without stop

back ground subtract when reduced size

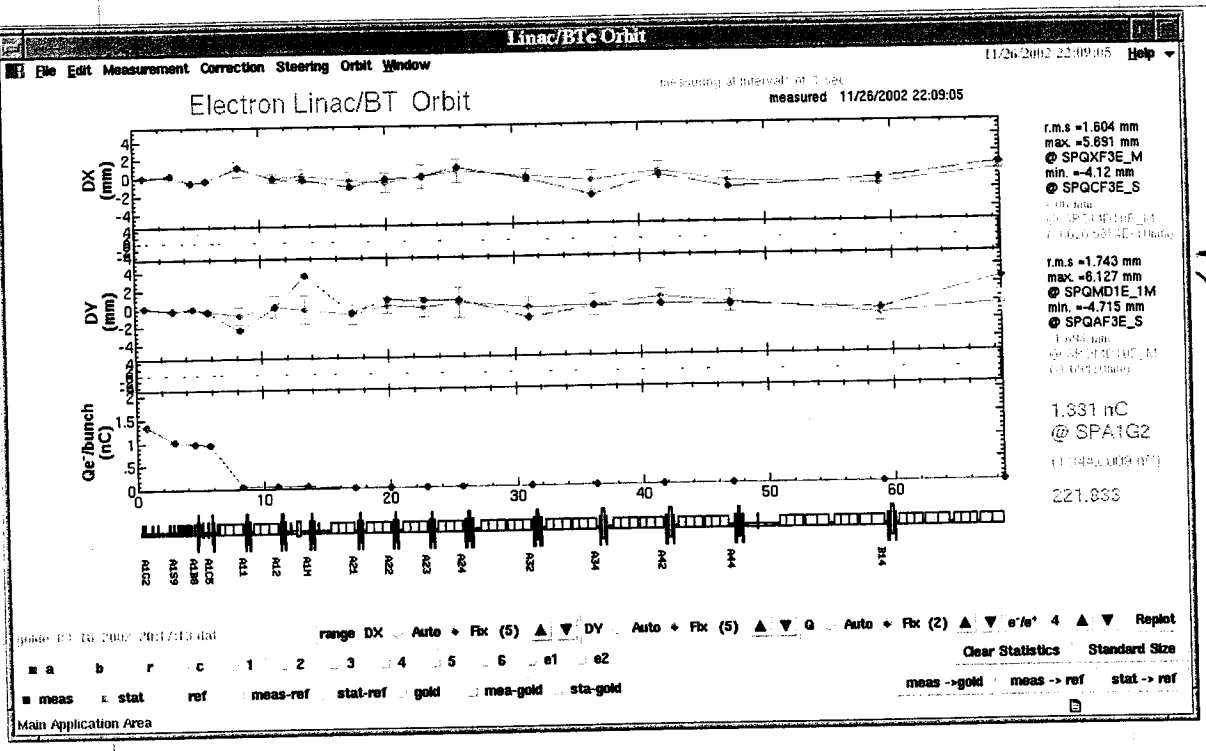
numerical size calibration data



コリメータ φ4 mm

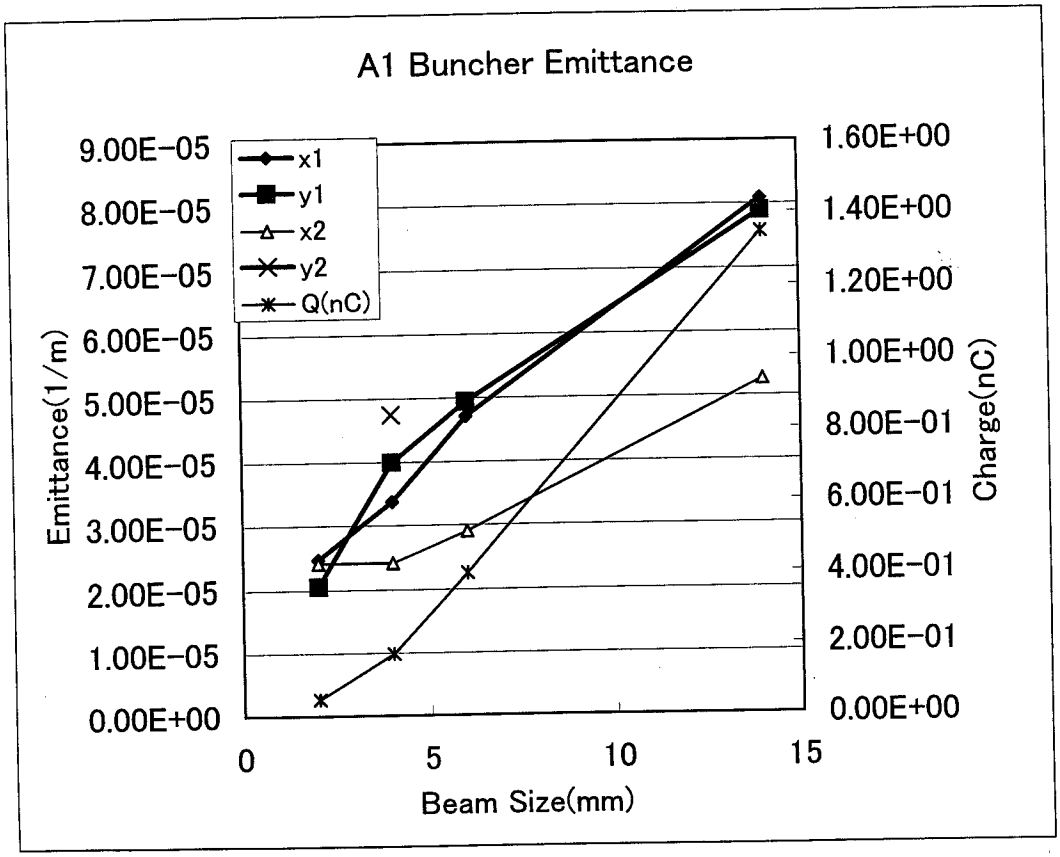


コリメータ φ6 mm



コリメータなし

	x1	y1	x2	y2	Q(nC)	
14	8.09E-05	7.89E-05	5.26E-05	#N/A	1.35E+00	コリメータ無し
6	4.71E-05	4.94E-05	2.90E-05	#N/A	4.01E-01	コリメータ φ6mm
4	3.38E-05	3.99E-05	2.42E-05	4.75E-05	1.75E-01	コリメータ φ4mm
2	2.47E-05	2.06E-05	2.42E-05	#N/A	4.70E-02	コリメータ φ2mm



QF_A1_C5 2.977 A 2.5075 T/m
QD_A1_C5 3.592 A 3.01367 T/m

if QD_A1_B8 scanned (QF_A1_B8 fixed), both bottoms can be seen
if QF_A1_B8 scanned (QD_A1_B8 fixed), only x bottoms can be seen

emitt.20021126-1613-qd_a1_b8-sc_a1_c5
QF_A1_B8 = 4.0A 3.35368T/m
QD_A1_B8 scanned
from 1.0554T/m to 4.60482T/m
from 1.2A to 5.5A

(emitt.20021126-1649-qf_a1_b8-sc_a1_c5)
emitt.20021126-1657-qf_a1_b8-sc_a1_c5
QD_A1_B8 = 2.498 A 2.11667 T/m
QF_A1_B8 scanned
from 1.71112T/m to 3.93552T/m
from 2A to 4.7A

emitt.20021126-1740-qf_a1_b8-sc_a1_c5
Collimater(6mm)
QD_A1_B8 = 2.498 A 2.11667 T/m
QF_A1_B8 scanned
from 1.71112 T/m to 3.93552 T/m

emitt.20021126-1815-qd_a1_b8-sc_a1_c5
Collimater(6mm)
QF_A1_B8 = 4.002A 3.35368T/m
QD_A1_B8 scanned
from 1.3847T/m to 4.60482T/m
from 1.6A to 5.5A

emitt.20021126-1848-qd_a1_b8-sc_a1_c5
Collimater(4mm)
QF_A1_B8 = 4.002A 3.35368T/m
QD_A1_B8 scanned
from 2.11816T/m to 4.18655T/m
from 2.5A to 5.0A

emitt.20021126-1910-qf_a1_b8-sc_a1_c5
Collimater(4mm)
QD_A1_B8 = 2.498 A 2.11667 T/m
QF_A1_B8 scanned
from 1.87392T/m to 3.60141T/m
from 2.2A to 4.3A

emitt.20021126-2106-qd_a1_b8-sc_a1_c5
emitt.20021126-2115-qd_a1_b8-sc_a1_c5 (bad data trimmed)
Collimater(2mm)
QF_A1_B8 = 3.5A 2.93705T/m
QD_A1_B8 scanned
from 1.71112T/m to 3.60141T/m
from 2A to 4.29999A

emitt.20021126-2134-qd_a1_b8-sc_a1_c5
Collimater(2mm)
QF_A1_B8 = 3.5A 2.93705T/m
QD_A1_B8 scanned
from 2.11816T/m to 3.51807T/m
from 2.5A to 4.2A

emitt.20021126-2151-qd_a1_b8-sc_a1_c5
Collimater(2mm)
QF_A1_B8 = 3.5A 2.93705T/m
QD_A1_B8 scanned
from 1.71112T/m to 3.51807T/m
from 2.0A to 4.2A
Background(Threshold) level is optimized only for X-axis

(SP_A1_G2 reading in 10mV)

2002/11/27 エミッタンス測定

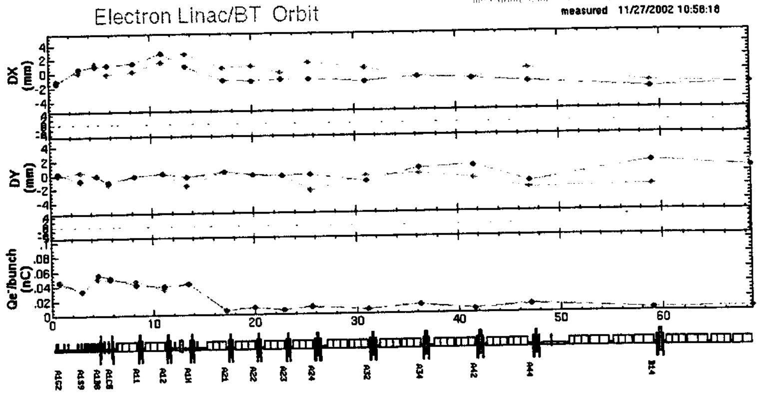
コリメータ 2mm

Beam 25Hz

File Edit Measurement Correction Steering Orbit Window Help

measured 11/27/2002 10:58:18

Electron Linac/BT Orbit



r.m.s =1.672 mm
max. =6.396 mm
@ SPQXF3E_M
min. =-5.886 mm
@ SPQAF3E_S

r.m.s =1.686 mm
max. =6.262 mm
@ SPQXF5E_S
min. =-7.132 mm
@ SPQAF3E_S

.045 nC
@ SPA1G2

range DX Auto Fix (5) DY Auto Fix (5) Q Auto Fix (.1) e/e' 4 Replot

Clear Statistics Standard Size

a b r c 1 2 3 4 5 6 e1 e2

meas stat ref meas-ref stat-ref gold mea-gold sta-gold

meas ->gold meas -> ref stat -> ref

Hard Copy

γε = 3.257E-5; α = -1.288; β = .758; Bmag = 1.446

emitt.20021127-1118-qd_a1_b8-sc_a1_c5 (re-fit)

Condition

Fitting Direction

Horizontal

Vertical

Q : QDA1B8 SC : SCA1C5

Fitting

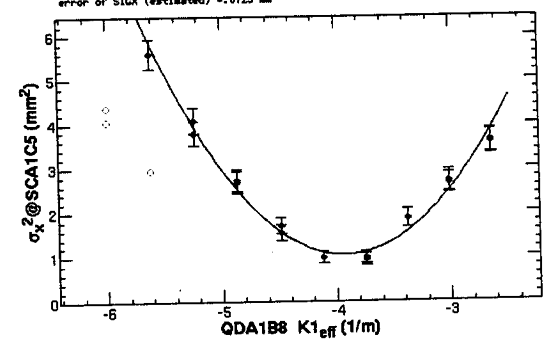
Read Data & Fit :

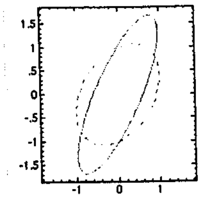
Raw Saved

Redo fit with current data

Redo Fit

Momentum = 14.6989 MeV
EMITX =1.1322E-6 ± 2.6898E-8 m, gamma*EMITX =3.2568E-5 ± 7.7342E-7 m
ALPHAX =-1.2884 ± .0825, BETAX =.7583 ± .0401 m at START
error of SIGX (estimated) =.0725 mm
11/27/2002 11:20:08





外はなし

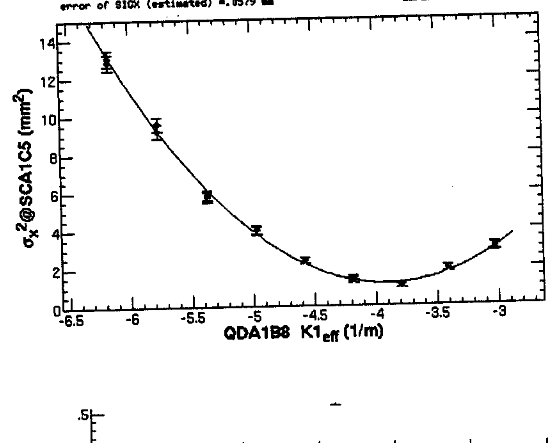
ALPHAX =-1.5065 ± .0513, BETAX =.8425 ± .0283 m at START
error of SIGX (estimated) =.0579 mm
11/27/2002 11:37:09

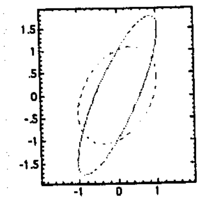
Fitting

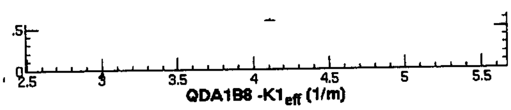
Read Data & Fit :

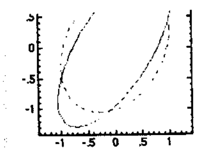
Raw Saved

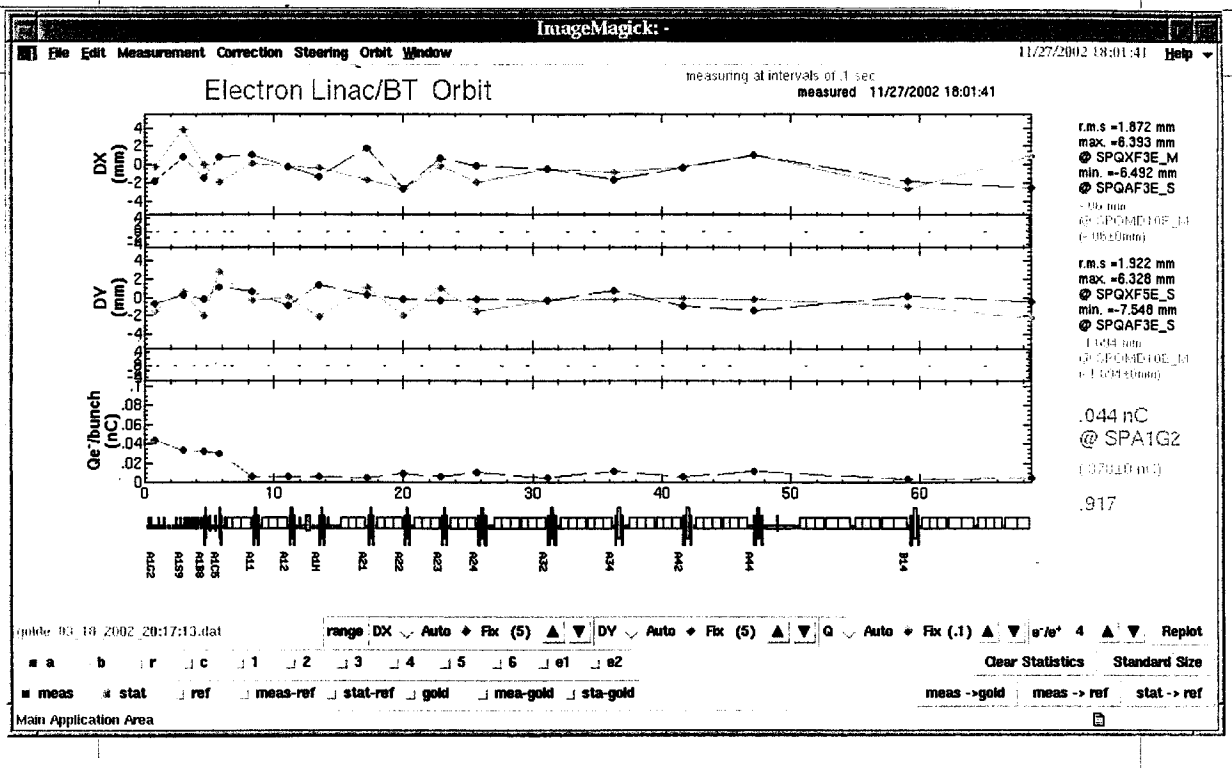
Redo fit with current data





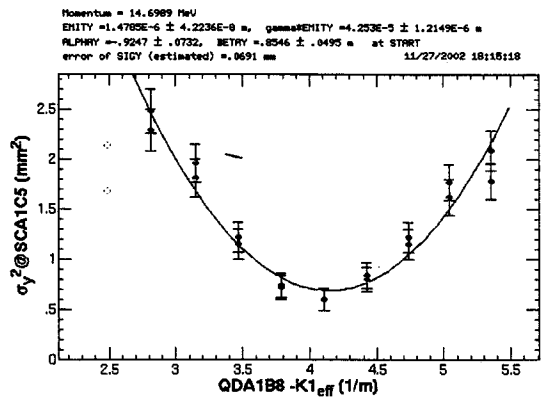




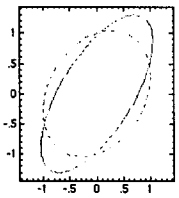


$\gamma\varepsilon_y$ = 4.253E-5; α_y = -.925; β_y = .855; Bmag = 1.165

emitt20021127-1814-qd_a1_b8-sc_a1_c5 (re-fit)

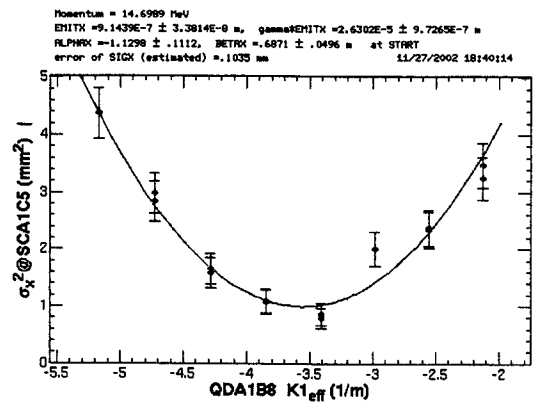


Condition
Fitting Direction
Horizontal
◆ Vertical
Q : QDA1B8 SC : SCA1C5
Fitting
Read Data & Fit :
Raw Saved
Redo fit with current data
Redo fit

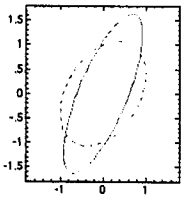


$\gamma\varepsilon_x$ = 2.630E-5; α_x = -1.130; β_x = .687; Bmag = 1.379

emitt20021127-1839-qd_a1_b8-sc_a1_c5



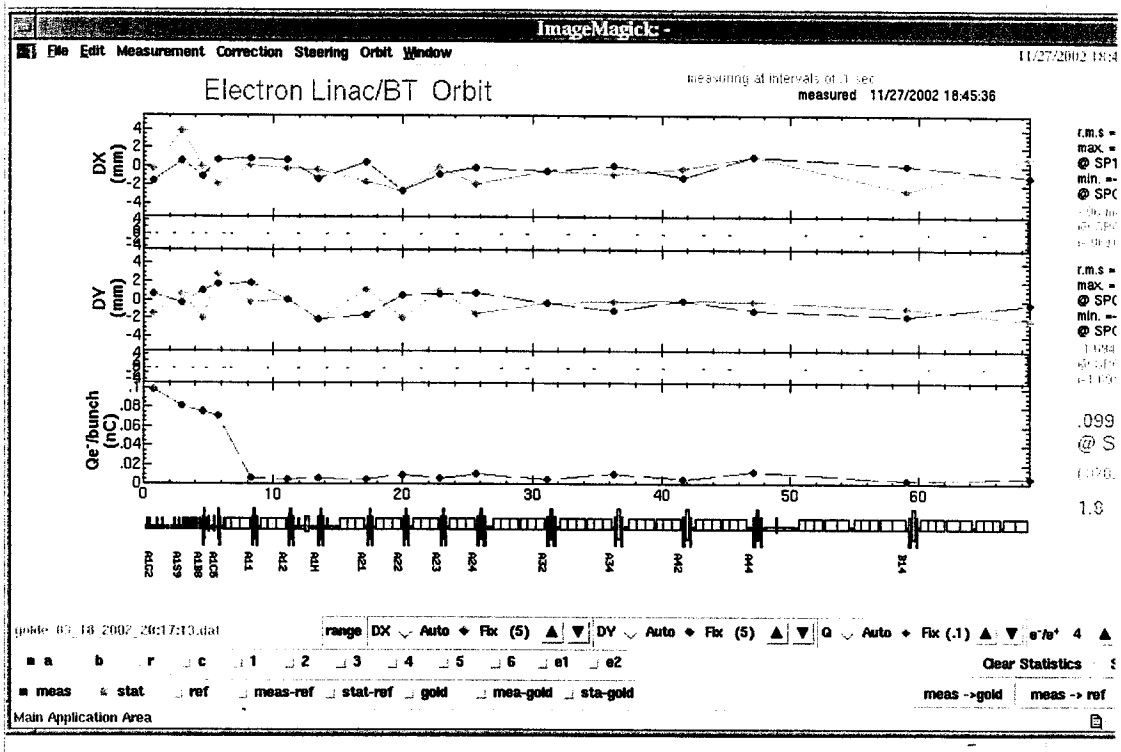
Condition
Fitting Direction
◆ Horizontal
Vertical
Q : QDA1B8 SC : SCA1C5
Fitting
Read Data & Fit :
Raw Saved
Redo fit with current data
Redo fit

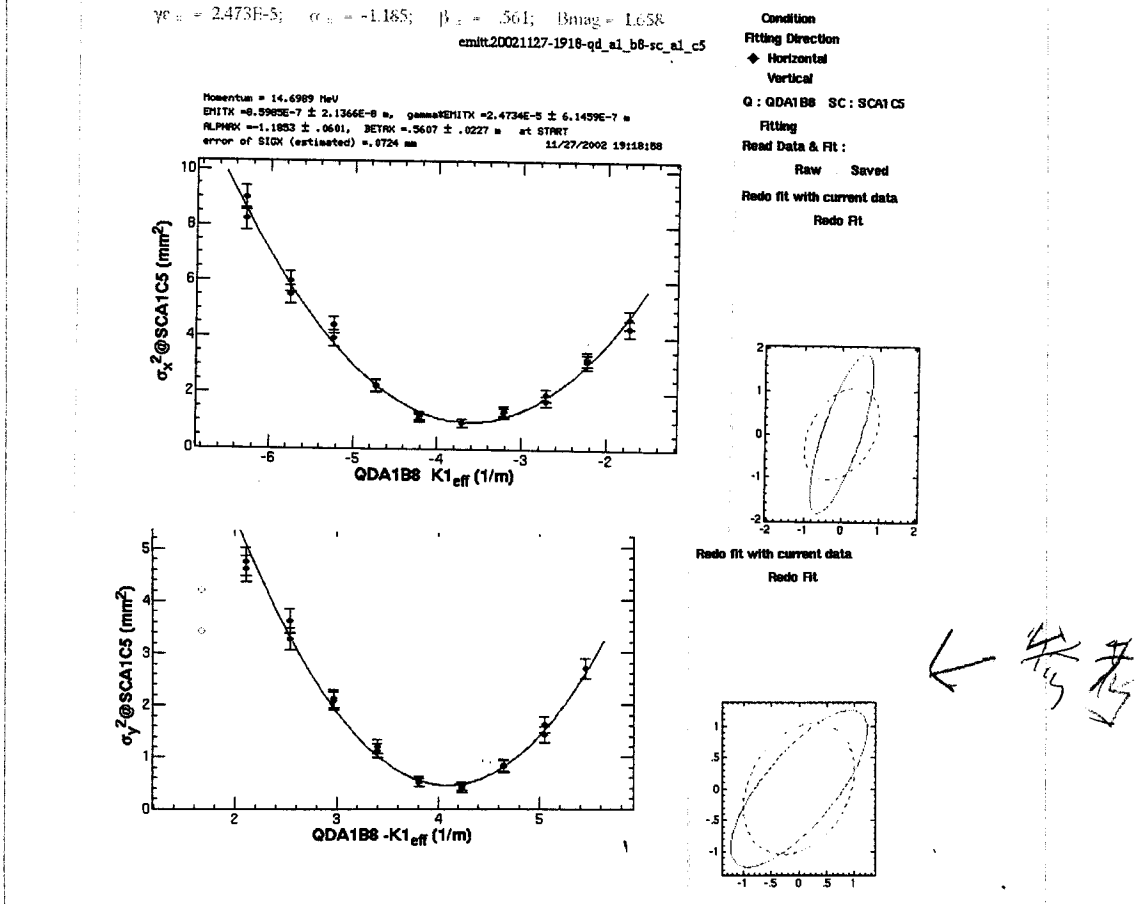


GUN Bias 0949 (ADC, 308.3V) 0.044nC, 5Hz

⇓

0880 (ADC 271.3V) 0.099nC

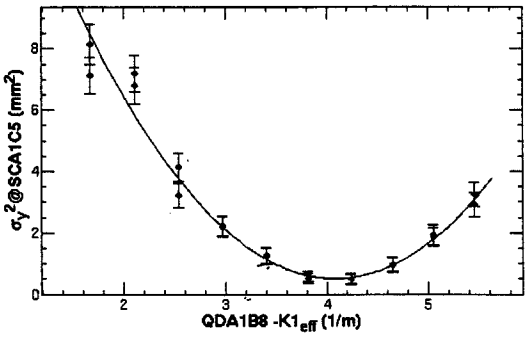


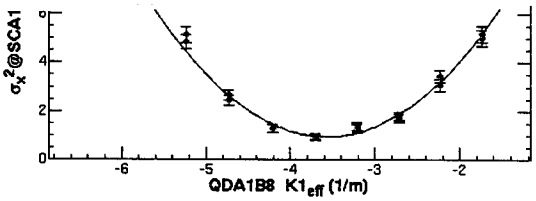


$\gamma\varepsilon_y$ = 4.158E-5; α_y = -1.174; β_y = 1.209; Bmag = 1.258

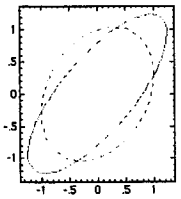
emitt20021127-1942-qd_a1_b8-sc_a1_c5 (re-fit)

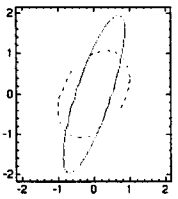
Momentum = 14.6989 MeV
EMITY =1.4456E-6 ± 9.4529E-8 m, gammaEMITY =4.1584E-5 ± 2.7191E-6 m
ALPHAY =-1.1739 ± .1148, BETAY =1.2089 ± .1061 m at START
error of SIGY (estimated) =.113 mm 11/27/2002 19:43:01

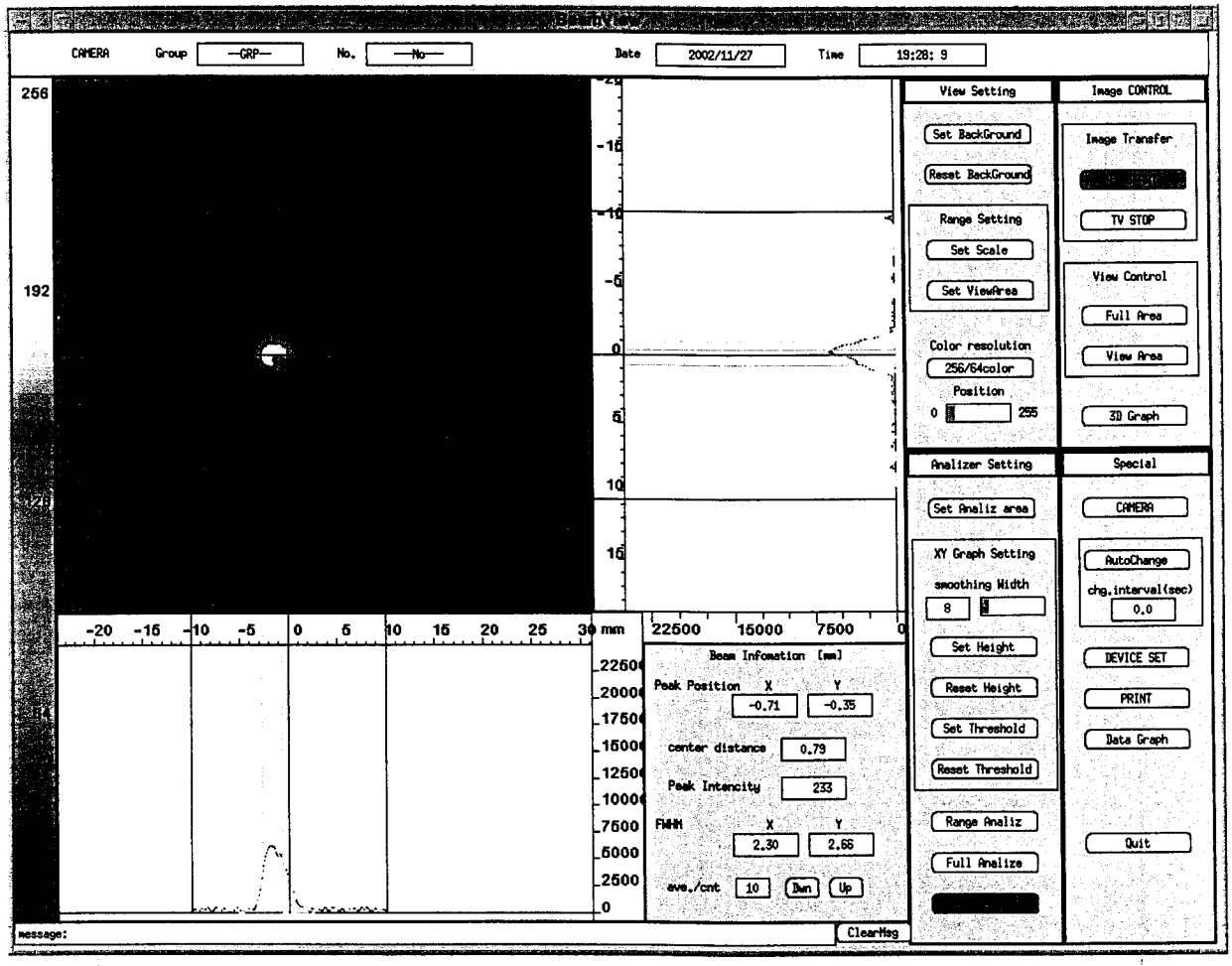


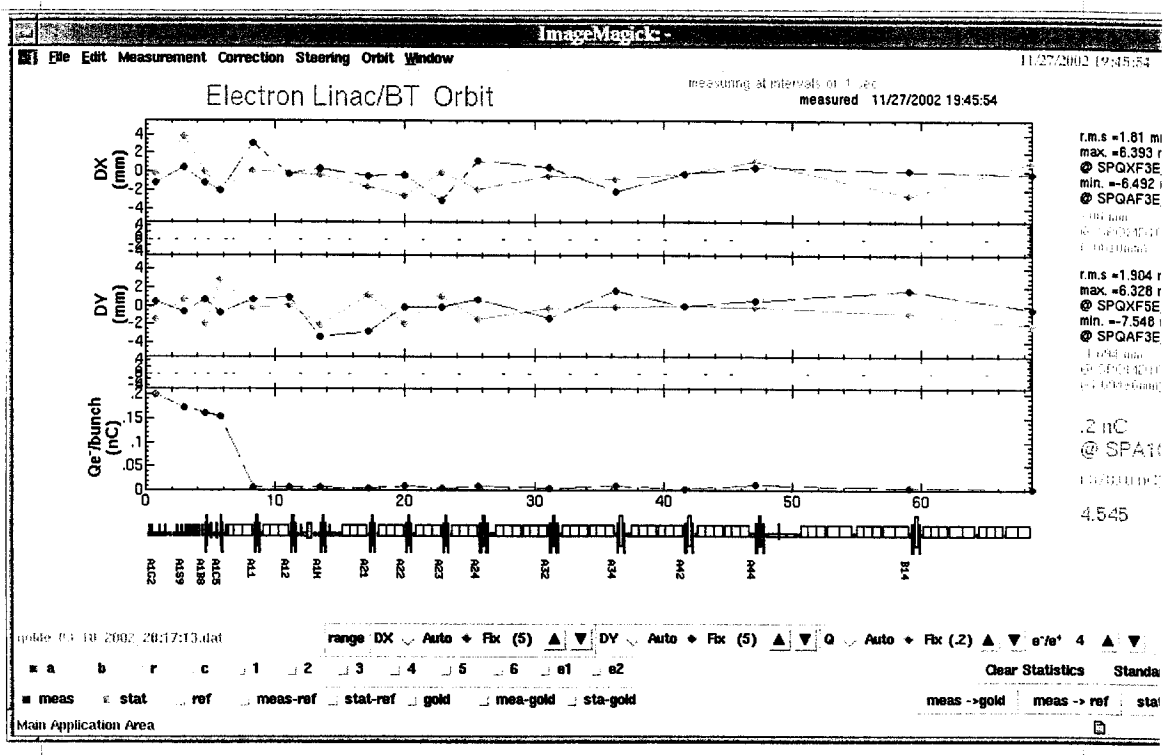


Condition
Fitting Direction
Horizontal
◆ Vertical
Q : QDA1B8 SC : SCA1C5
Fitting
Read Data & Fit :
Raw Saved
Redo fit with current data
Redo Fit









Gun Bias
DAC 0715 ADC 225.6V 0.20 n