

KEKB Shift Report Date : 2007/11/28(Wed.)

Day Shift : Kamada(K);Tanaka, Aoyama, Watanabe(M);Hazumi (B)

Abort storm, HER accompanied abort avoided

(Plan) 0. Check LER bump for horizontal η' at IP

1. LER Beam Size minimization by Downhill Simplex
2. Luminosity optimization by Downhill Simplex
3. Try to avoid second abort of HER by increased beam current at collision restart

Peak \mathcal{L} / G-Ratio : **14.600** $\times 10^{33}$ **cm⁻²s⁻¹** / **97** %

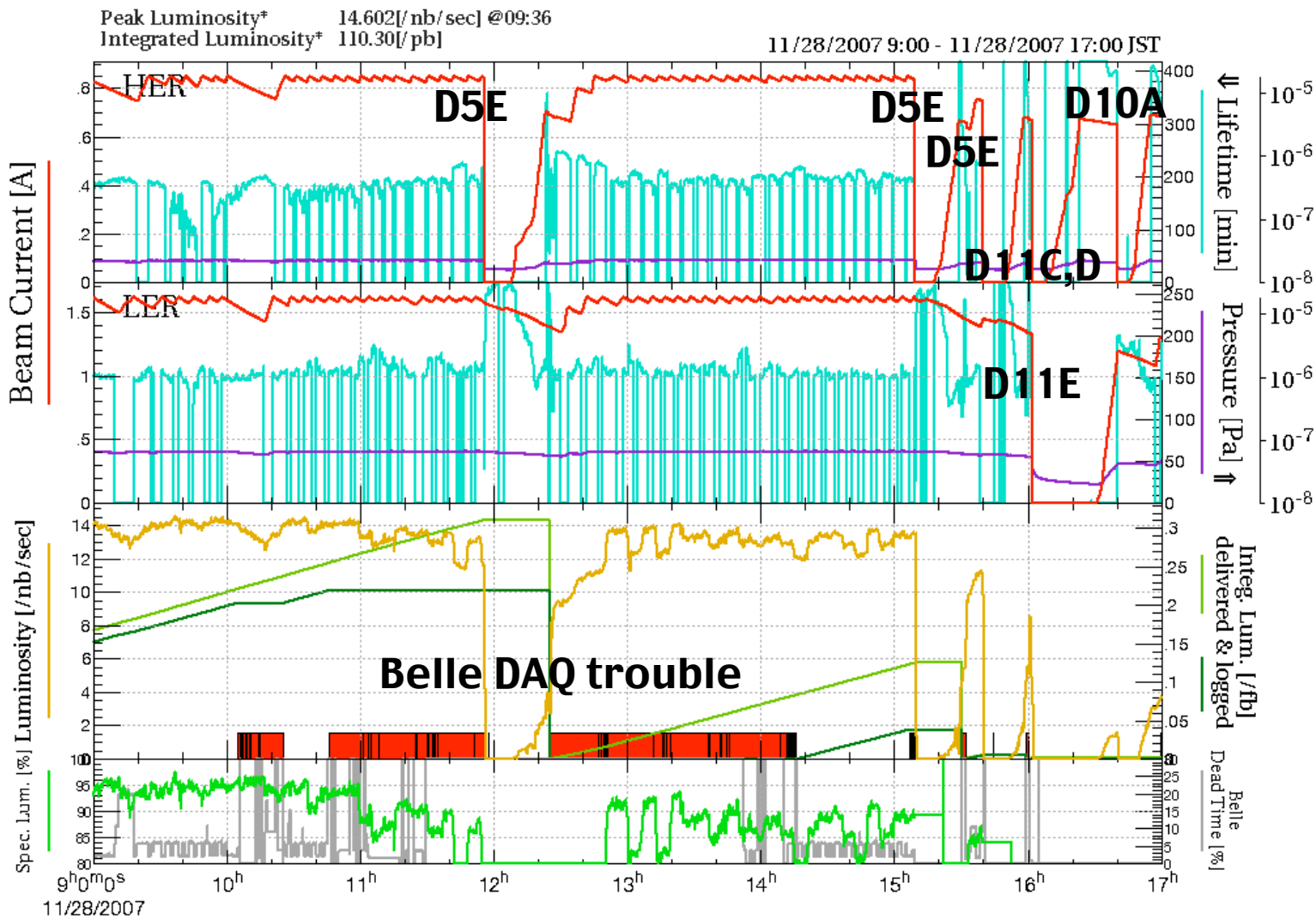
Shift \mathcal{L} / Day \mathcal{L} : **110.3** **pb⁻¹**

Beam Current : LER **1620** mA / HER **850** mA

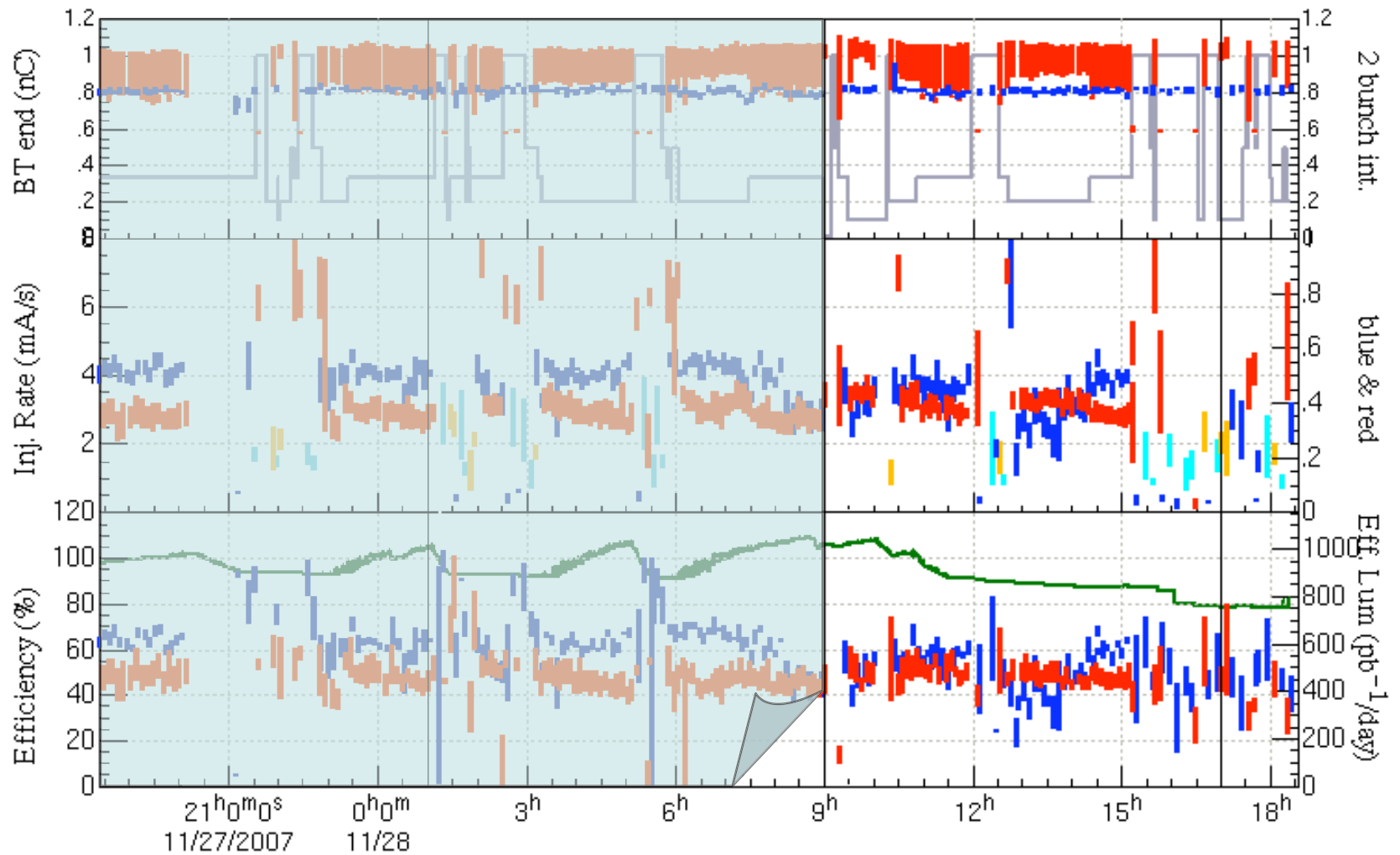
Fill pattern : 3.06spacing, 1trains, 1584+1 bunches

Aborts : LER_{only} : **0** / HER_{only} : **4** / Both : **1** ₁

Shift Summary



Injection Summary



Tuning Items

- H offset, V angle
- Simplex LER beam size minimization

	LER	HER
R_1	0.63 -> 1.00	
R_2	4.79 -> 4.08	
R_3	1.19 -> 0.60	
R_4	-0.50 -> -0.86	
η_y^*	0.31 -> 0.58	
$\eta_y^{*'} $	-0.07 -> -0.62	
η_x^*		
$\eta_x^{*'} $		

Knob 1

Knob1 Knob2 Knob3

LER

Room Phase
-19.04 → -19.1

Δf_{RF}
-5.76 → -5.88

Waist
.1 → .1

η_Y
.31 → .58

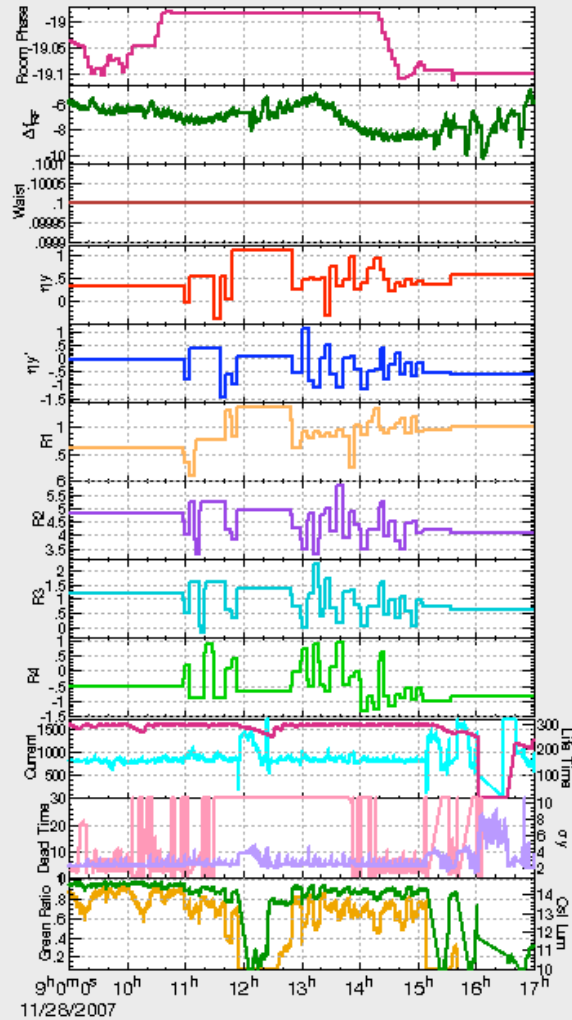
η_Y'
-.07 → -.62

R1
.63 → 1

R2
4.79 → 4.08

R3
1.19 → .6

R4
-.5 → -.86



11/28/2007

HER

Voffset
-2.65 → -2.65

Vangle
-.535 → -.535

Waist
.85 → .85

η_Y
.34 → .34

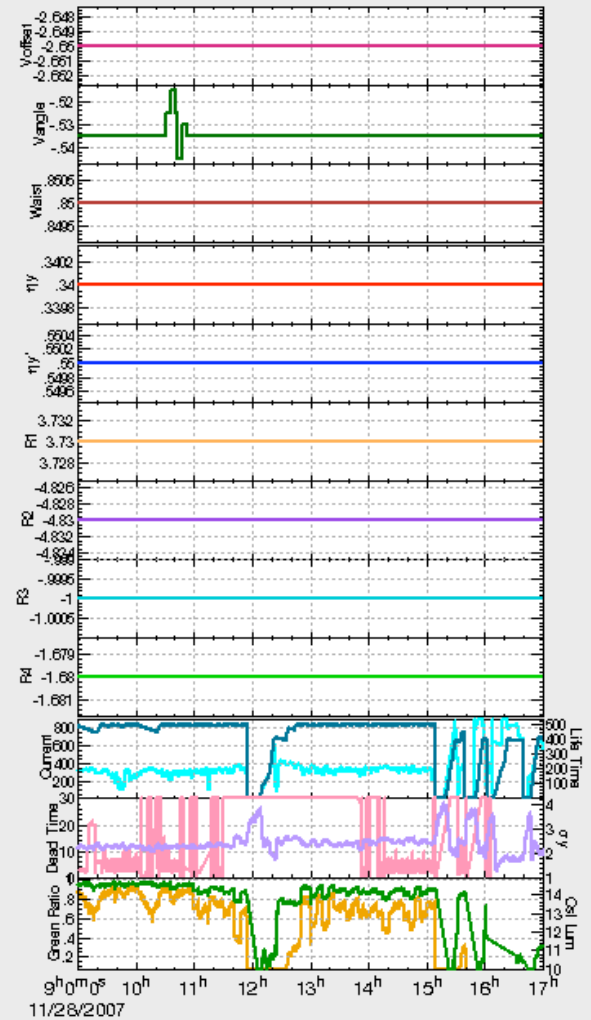
η_Y'
.55 → .55

R1
3.73 → 3.73

R2
-4.83 → -4.83

R3
-1 → -1

R4
-1.68 → -1.68



11/28/2007

Lum_{Max}: 14.602
GR_{Max}: 97.47%

Knob 2

Knob1 Knob2 Knob3

LER

LER Size@Inj

0 -> 0@0A

v_x @0A

.5087 -> .5087

v_y @0A

.5774 -> .5774

ξ_x

-.474 -> -.474

ξ_y

4.24 -> 4.24

$d_\delta \alpha_x^*$

14.05 -> 14.05

$d_\delta \alpha_y^*$

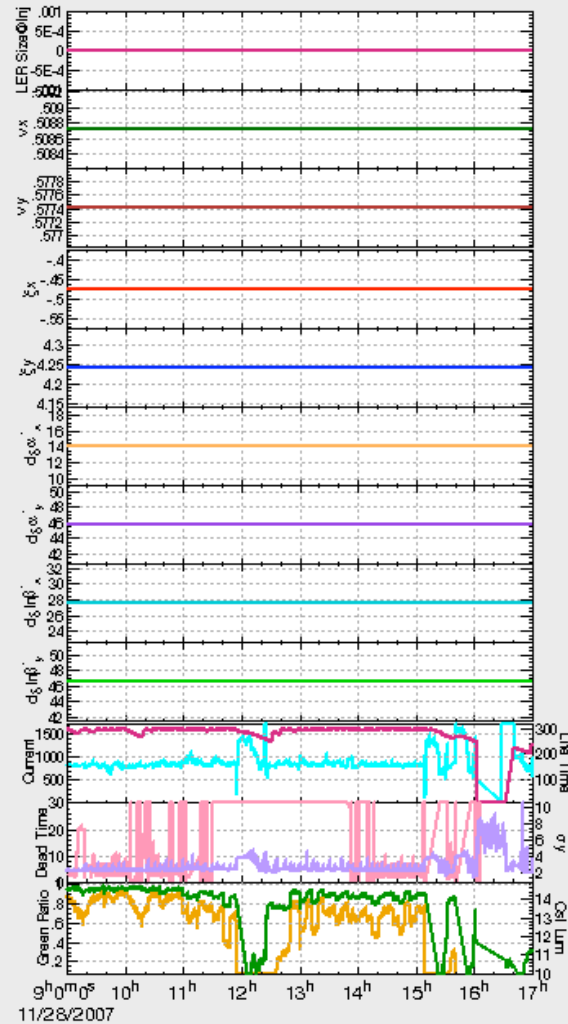
45.73 -> 45.73

$d_\delta \ln \beta_x^*$

27.55 -> 27.55

$d_\delta \ln \beta_y^*$

46.55 -> 46.55



11/28/2007

HER

LER Size@Col

0 -> 0@0A

v_x @0A

.5117 -> .5117

v_y @0A

.592 -> .592

ξ_x

-1.208 -> -1.208

ξ_y

.88 -> .88

$d_\delta \alpha_x^*$

-1 -> -1

$d_\delta \alpha_y^*$

-40.49 -> -40.49

$d_\delta \ln \beta_x^*$

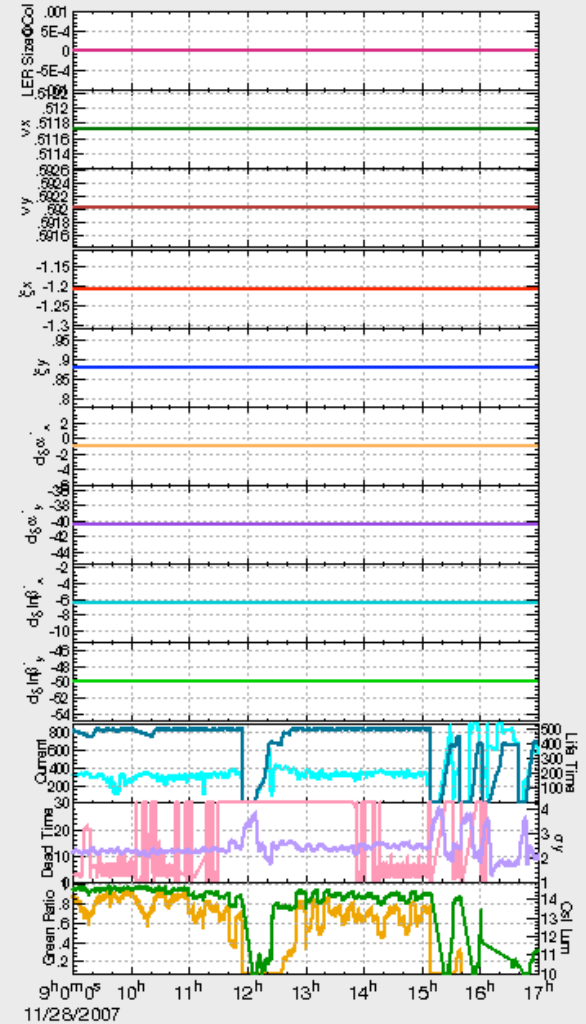
-6.55 -> -6.55

$d_\delta \ln \beta_y^*$

-49.97 -> -49.97

Lum_{Max} : 14.602

GR_{Max} : 97.47%



11/28/2007

Knob 3

Knob1 Knob2 Knob3

LER

Hoffset
 .702 -> .703

R2(Crab)
 5 -> 5

R4(Crab)
 -.49 -> -.49

ηy (SX)
 $-1.3E-4$ -> $-1.3E-4$

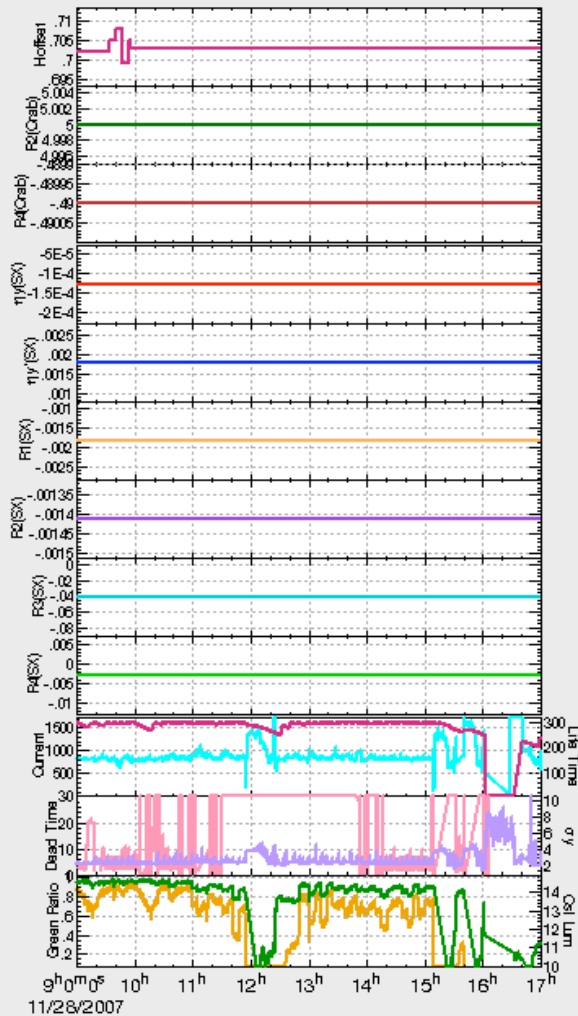
$\eta y'$ (SX)
 .002 -> .002

R1(SX)
 -.002 -> -.002

R2(SX)
 -.001 -> -.001

R3(SX)
 -.041 -> -.041

R4(SX)
 -.003 -> -.003



HER

Hangle
 0 -> 0

R2(Crab)
 -3.44 -> -3.44

R4(Crab)
 -1 -> -1

ηy (SX)
 $-3E-4$ -> $-3E-4$

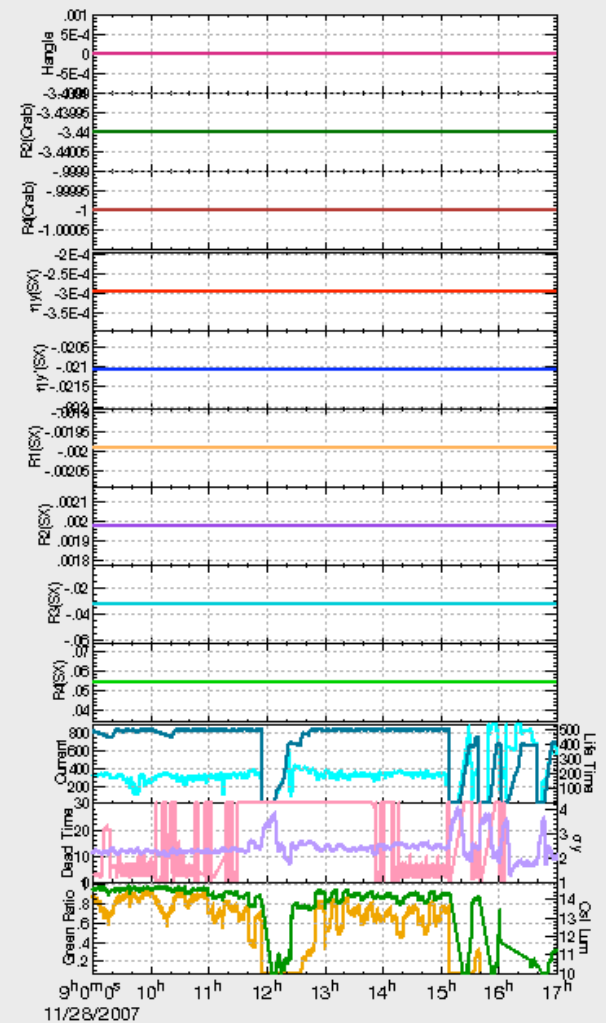
$\eta y'$ (SX)
 -.021 -> -.021

R1(SX)
 -.002 -> -.002

R2(SX)
 .002 -> .002

R3(SX)
 -.033 -> -.033

R4(SX)
 .054 -> .054



Lum_{Max}: 14.602
GR_{Max}: 97.47%

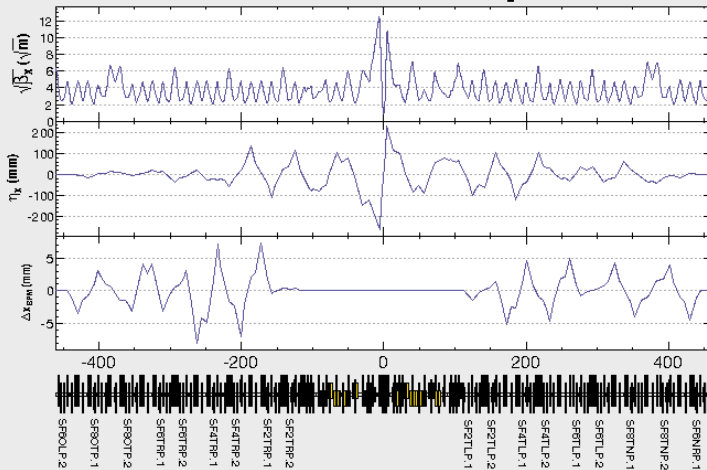
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Comments

1. 2nd abort of HER was avoided by increased beam current $\sim 700\text{mA}$ and $\sim 760\text{mA}$ at collision start. The second case is less favorite for HER life but LER more stable.
2. Station phase adjust to reduce D5E load (Akai)

LER IP Horizontal Dispersion



dispersion (BPM coordinate)

η_{lx} @ IP (1 = 0.64 mm) 3.18
 η_{lx}' @ IP (1 = 0.39 mrad) 70

Label

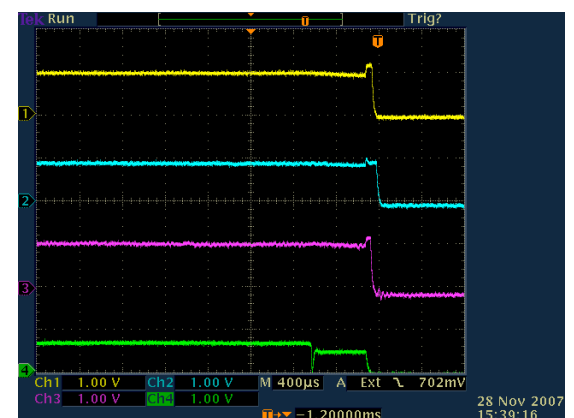
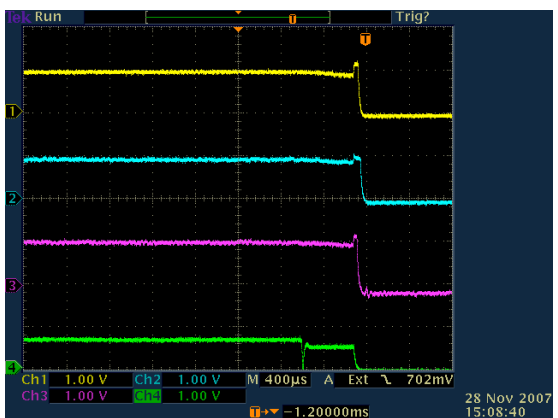
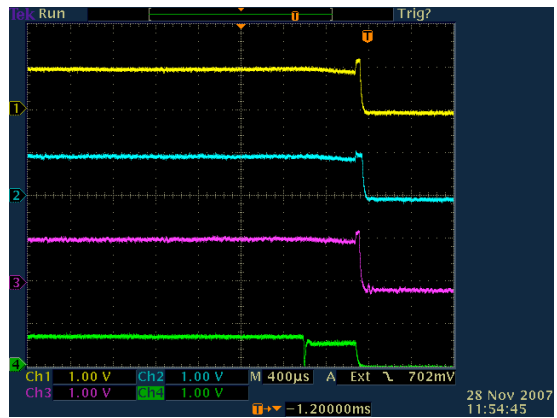
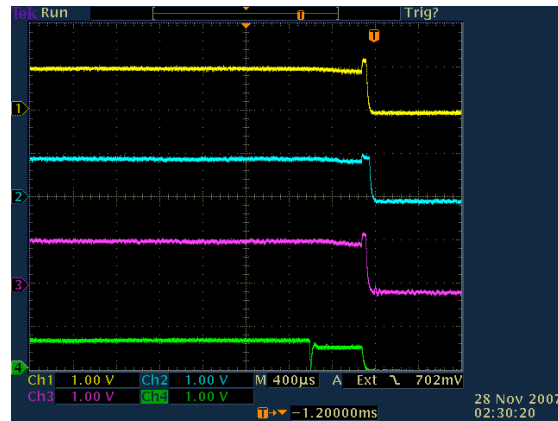
LERIPXDispersion on :0.0

Troubles

1. 10:50~14:15 Belle DAQ trouble
2. 11:55 HER abort, beam phase, ~848mA
D5E caused three aborts in 12 hrs., second coming of the symptom that appeared two year ago and not understood. (Kageyama)
3. ~12:28 Belle ECL board replace
4. 15:09 HER abort, beam phase, ~837mA
D5E caused
5. 16:02 HER abort, beam phase (D11C ARC DOOR KNOB, D11D ARC Coupler), LER abort, crab.

D5E cavity voltage at the related

1. 01:26 02:30
11:54 15:08 15:39



Thoughts and Proposals etc.

終わり

KEKB Shift Report Date : 2007/Nov/28(Wed)

Evening Shift : Suetake, Ieiri (K); Asai, Kawasumi (M); Tajima (B)

Retry size-minimum simplex, effective well

Schedule:

1. Size-minimum simplex for LER
2. Size-minimum simplex for HER and the iteration
3. Luminosity-maximum simplex

Peak \mathcal{L} / G-Ratio : **14.143** $\times 10^{33}$ **cm⁻²s⁻¹** / **95** %

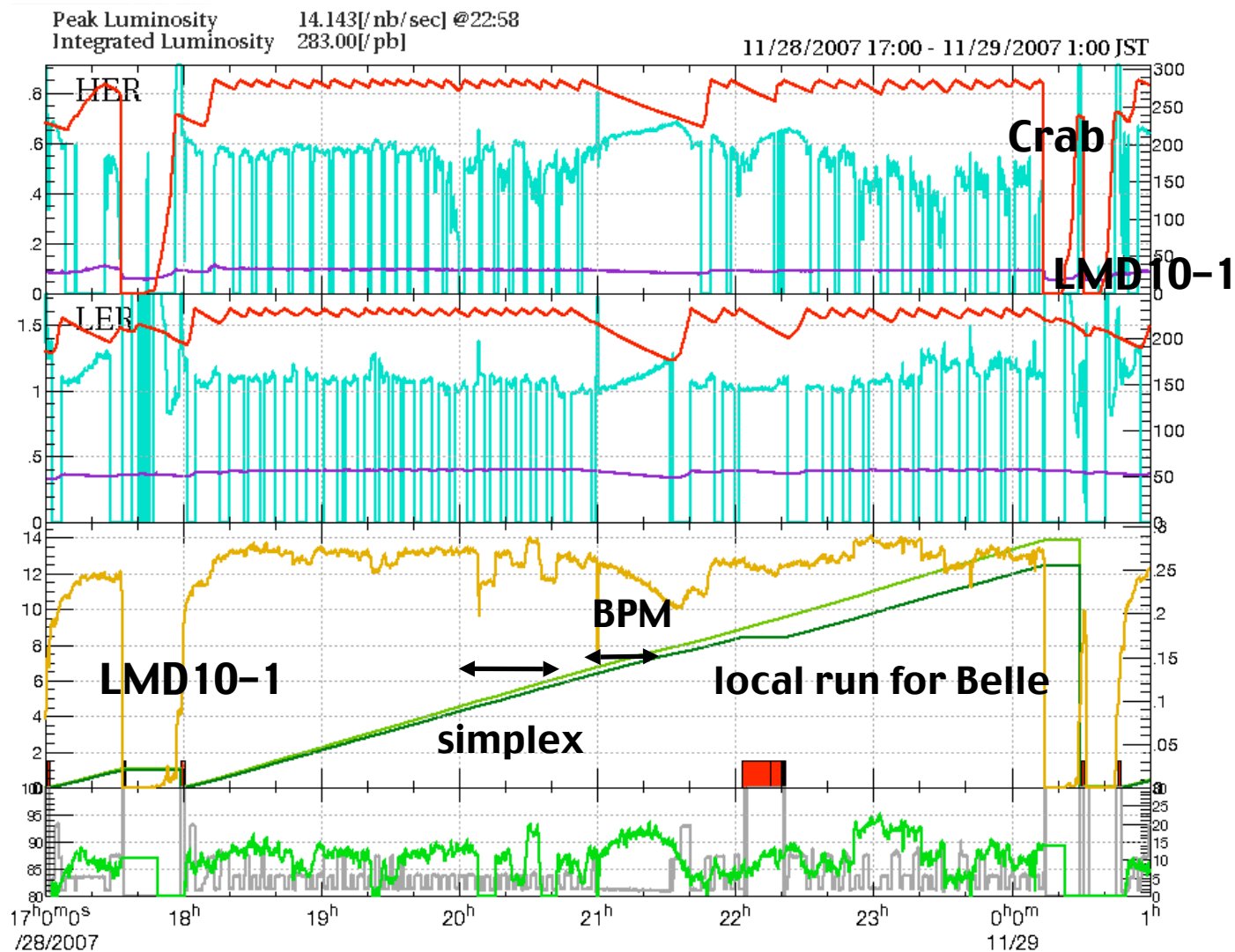
Shift \mathcal{L} / Day \mathcal{L} : **283.0** **pb⁻¹** / **712.9** **pb⁻¹**

Beam Current : LER **1620** mA / HER **850** mA

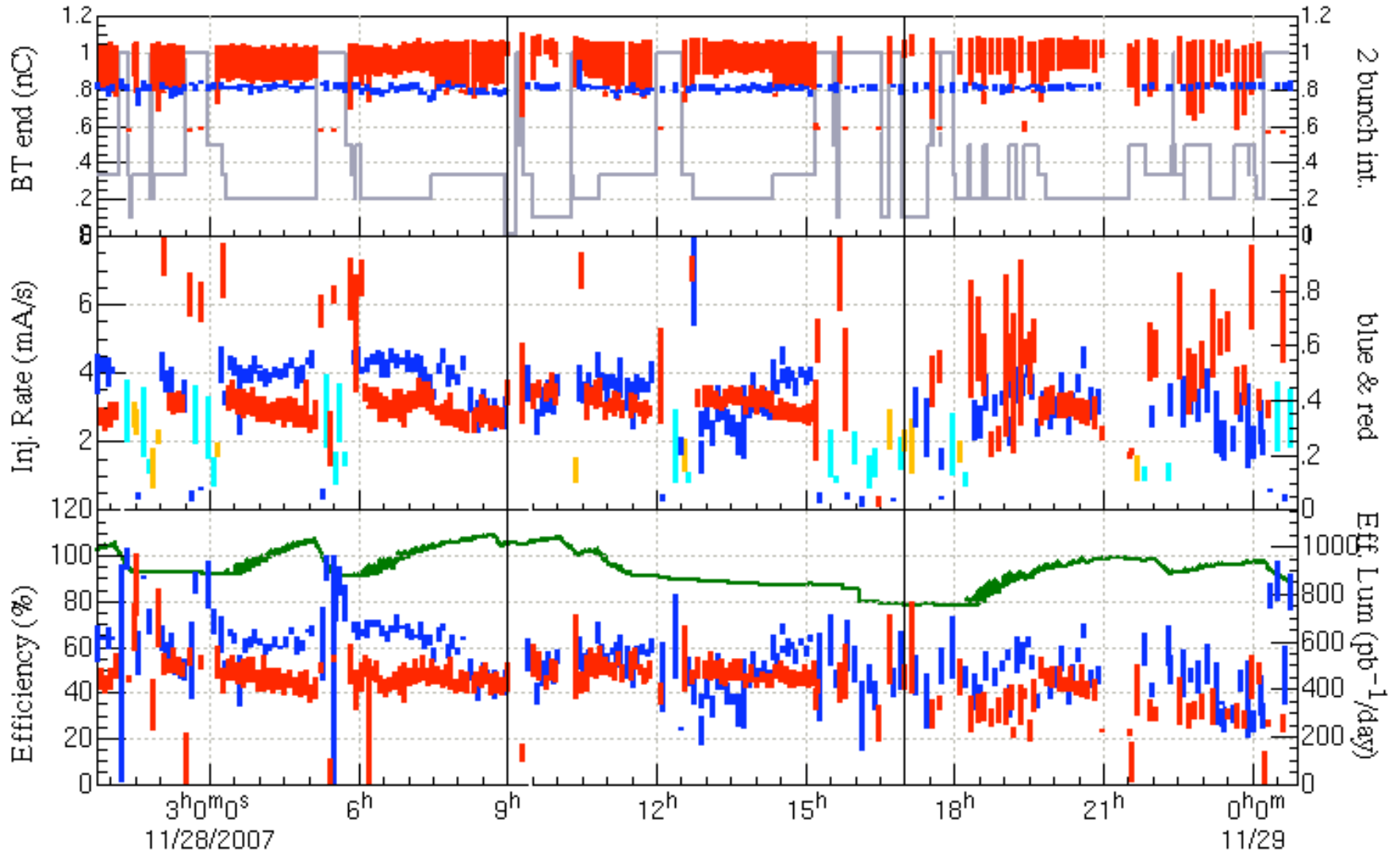
Fill pattern : 3.06spacing, 1train, 1584+1 bunches

Aborts : LER_{only} : **0** / HER_{only} : **3** / Both : **0**

Shift Summary

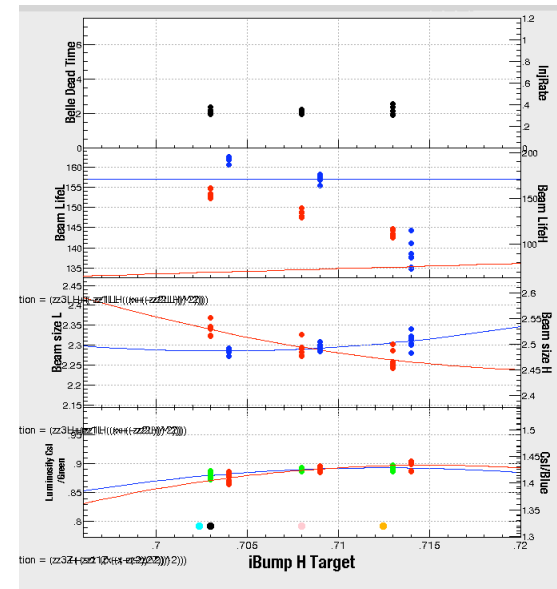


Injection Summary



Tuning Items

- Set the best parameter of Knob1, according to size-minimum simplex for LER
- HER H-tune +0.0005 for saving loss of pilot bunch
- Tune vertical offset, angle and horizontal offset
- Start size-minimum simplex for HER



Tuning Items

	LER	HER
R_1		
R_2		
R_3		
R_4		
η_y^*		
$\eta_y^{*'} $		
η_x^*		
$\eta_x^{*'} $		
R_{total}		

Knob 1

LER

Room Phase
-19.1 -> -18.23

Δt_{ref}
-5.88 -> -11.21

Waist
.1 -> .1

ηy
.58 -> .46

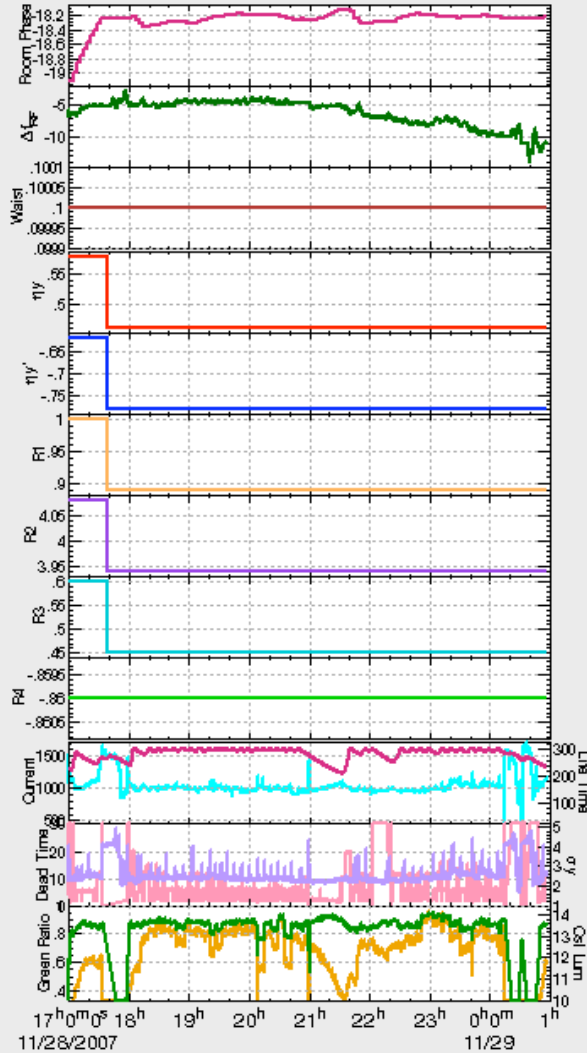
$\eta y'$
-.62 -> -.78

R1
1 -> .89

R2
4.08 -> 3.94

R3
.6 -> .45

R4
-.86 -> -.86



HER

Voffset
-2.65 -> -2.64

Vangle
-.535 -> -.525

Waist
.85 -> .85

ηy
.34 -> 1.24

$\eta y'$
.55 -> .24

R1
3.73 -> 4.52

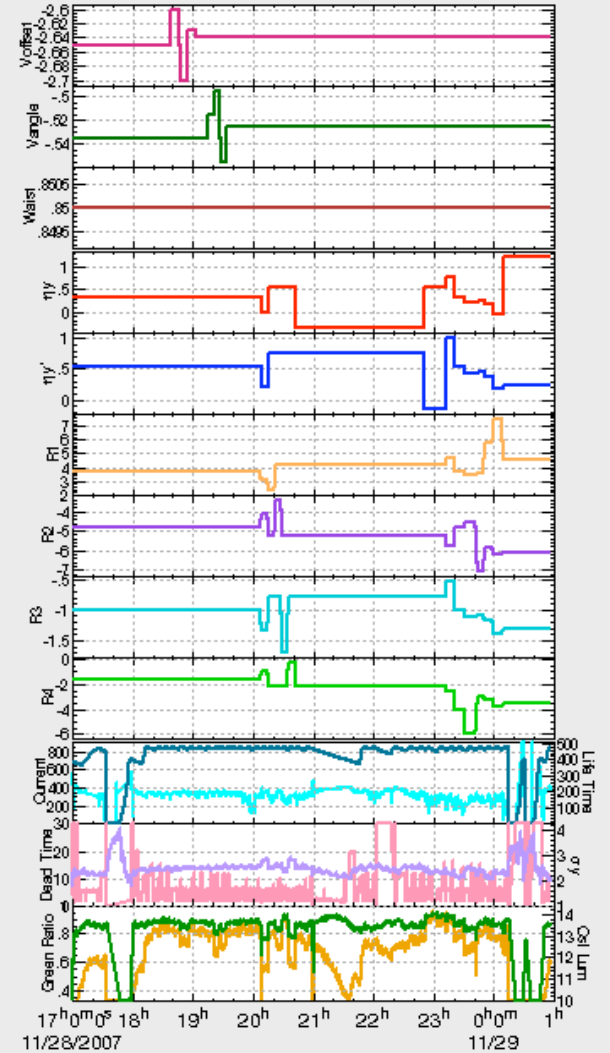
R2
-4.83 -> -6.09

R3
-1 -> -1.31

R4
-1.68 -> -3.57

Lum_{Max}: 14.143

GR_{Max}: 95.28%



Knob 2

LER

LER Size@Inj

0 -> 0@0A

v_x @0A

.5087 -> .5087

v_y @0A

.5774 -> .5774

ξ_x

-.474 -> -.474

ξ_y

4.24 -> 4.24

$d_s \alpha_x$

14.05 -> 14.05

$d_s \alpha_y$

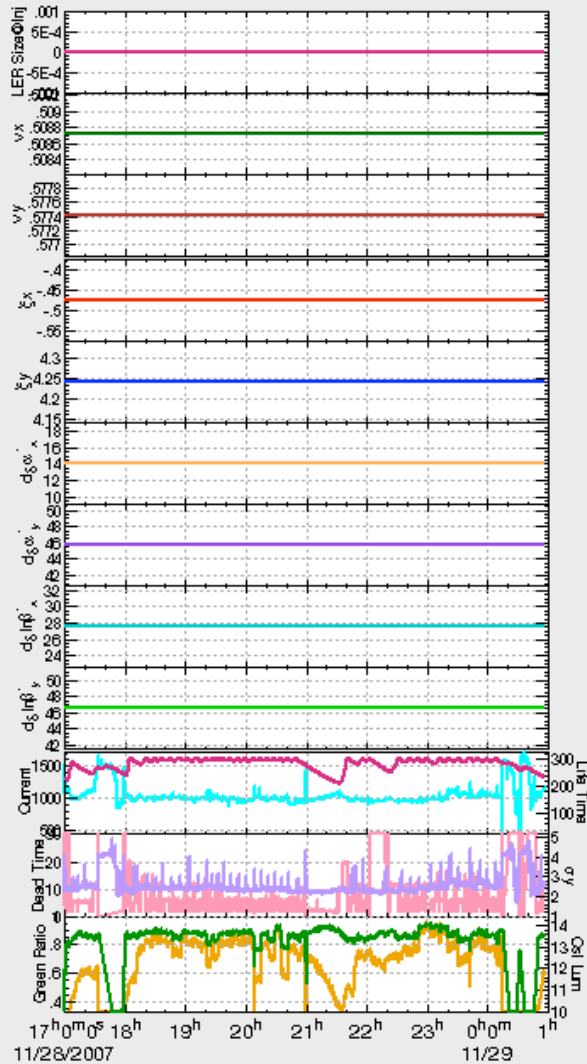
45.73 -> 45.73

$d_s \ln \beta_x$

27.55 -> 27.55

$d_s \ln \beta_y$

46.55 -> 46.55



HER

LER Size@Col

0 -> 0@0A

v_x @0A

.5117 -> .5122

v_y @0A

.592 -> .592

ξ_x

-1.208 -> -1.208

ξ_y

.88 -> .88

$d_s \alpha_x$

-1 -> -1

$d_s \alpha_y$

-40.49 -> -40.49

$d_s \ln \beta_x$

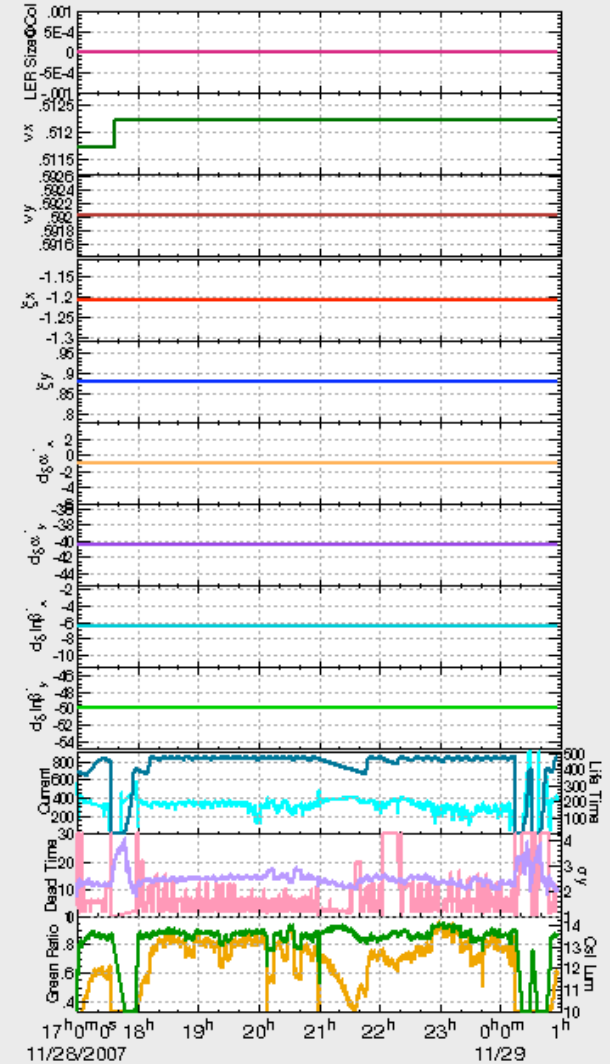
-6.55 -> -6.55

$d_s \ln \beta_y$

-49.97 -> -49.97

Lum_{Max}:14.143

GR_{Max}:95.28%



Knob 3

LER

Offset

.703 \rightarrow .7

R2(Crab)

5 \rightarrow 5

R4(Crab)

-.49 \rightarrow -.49

$\eta\gamma$ (SX)

$-1.3E-4 \rightarrow -2.6E-4$

$\eta\gamma'$ (SX)

.002 \rightarrow .013

R1(SX)

-.002 \rightarrow -.003

R2(SX)

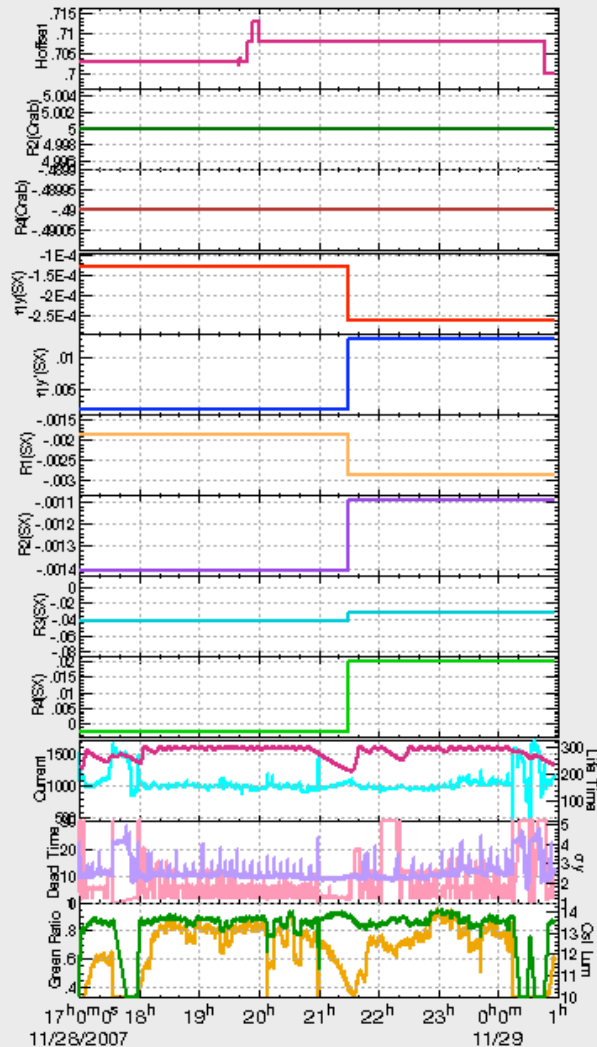
-.001 \rightarrow -.001

R3(SX)

-.041 \rightarrow -.031

R4(SX)

-.003 \rightarrow .02



HER

Hangle

0 \rightarrow 0

R2(Crab)

-3.44 \rightarrow -3.44

R4(Crab)

-1 \rightarrow -1

$\eta\gamma$ (SX)

$-3E-4 \rightarrow -3E-4$

$\eta\gamma'$ (SX)

-.021 \rightarrow -.021

R1(SX)

-.002 \rightarrow -.002

R2(SX)

.002 \rightarrow .002

R3(SX)

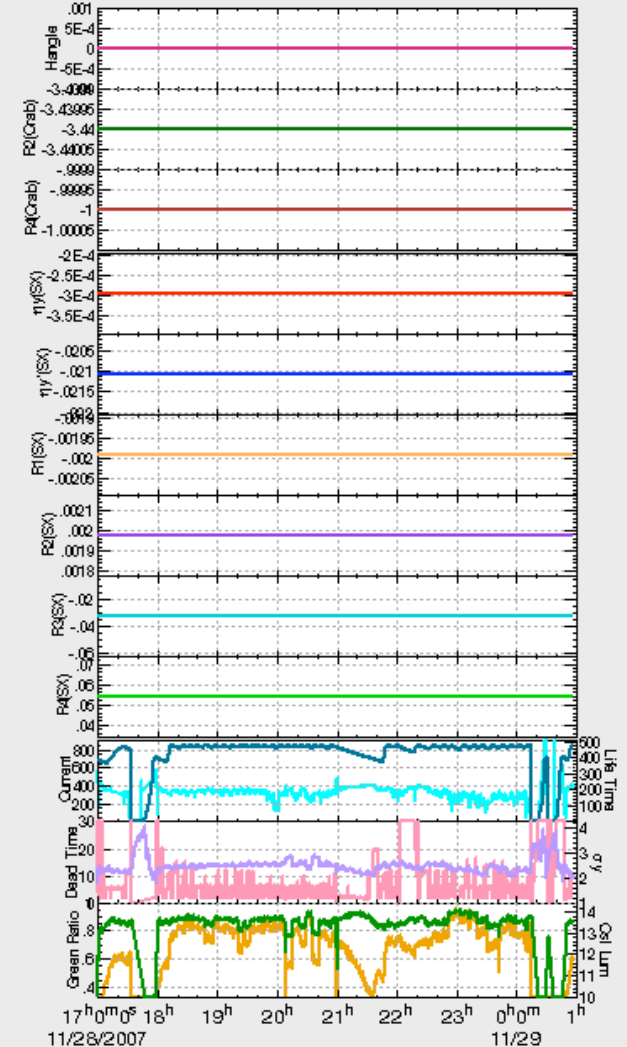
-.033 \rightarrow -.033

R4(SX)

.054 \rightarrow .054

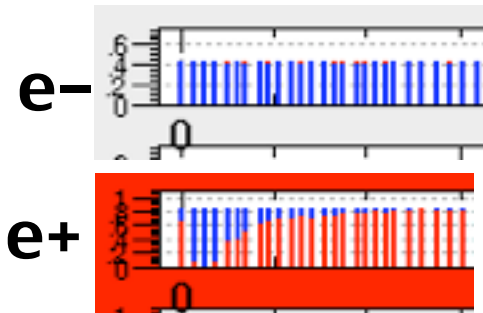
Lum_{Max}: 14.143

GR_{Max}: 95.28%



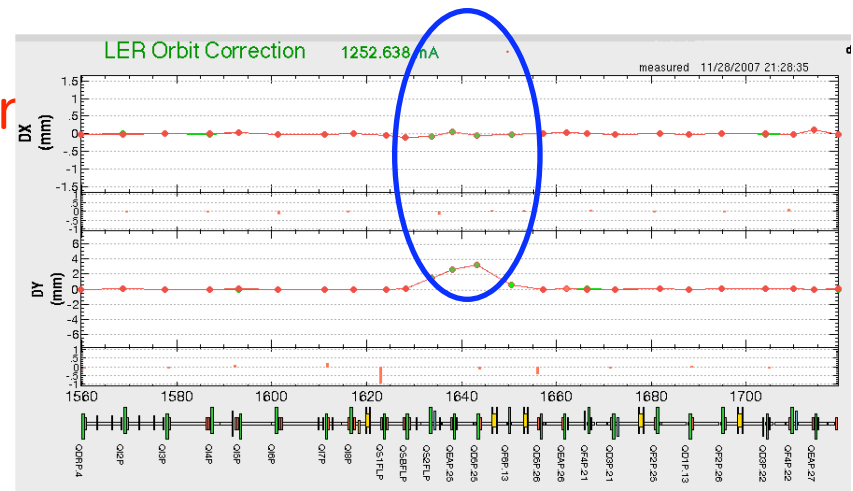
Comments

1. e^+ Bunch-Loss at the leading part
 - except 1st bunch, related to tune, cloud?



Troubles

1. 17:32 HER Abort by Loss-Monitor D10-1
 - Before the abort, pilot bunch was lost and the lifetime was very short.
2. 20:46 HER/LER Synch set stop, BMP D07 delayed, ccc stop
 - IOCBMD07 reboot, Orbit jump in a D07-region
 - not use the wrong BPMs
 - VXI Main Flame #5 failure, need to replace
3. 21:08 IOCBMD11B: 9 sec time lag
4. 21:48 ZHQA6RE (steering) time-out alarm
5. 0:13 HER crab abort
6. 0:31 HER Abort by Loss-Mor
7. 0:40 Y505 30%



Suggestions and Proposals etc.

1. Table of tuning items would not be necessary.

終わり

KEKB Shift Report Date : 2007/11/29(Thu)

Morning Shift : M. Satoh(K); Fuke, Shimodohmae(M); Katayama(B)

The first half: Stable => Abort

1. Size-minimum simplex for HER
2. Luminosity-maximum simplex

Peak \mathcal{L} / G-Ratio : **14.035** $\times 10^{33}$ **cm⁻²s⁻¹** / **95** %

Shift \mathcal{L} : **282.6** **pb⁻¹**

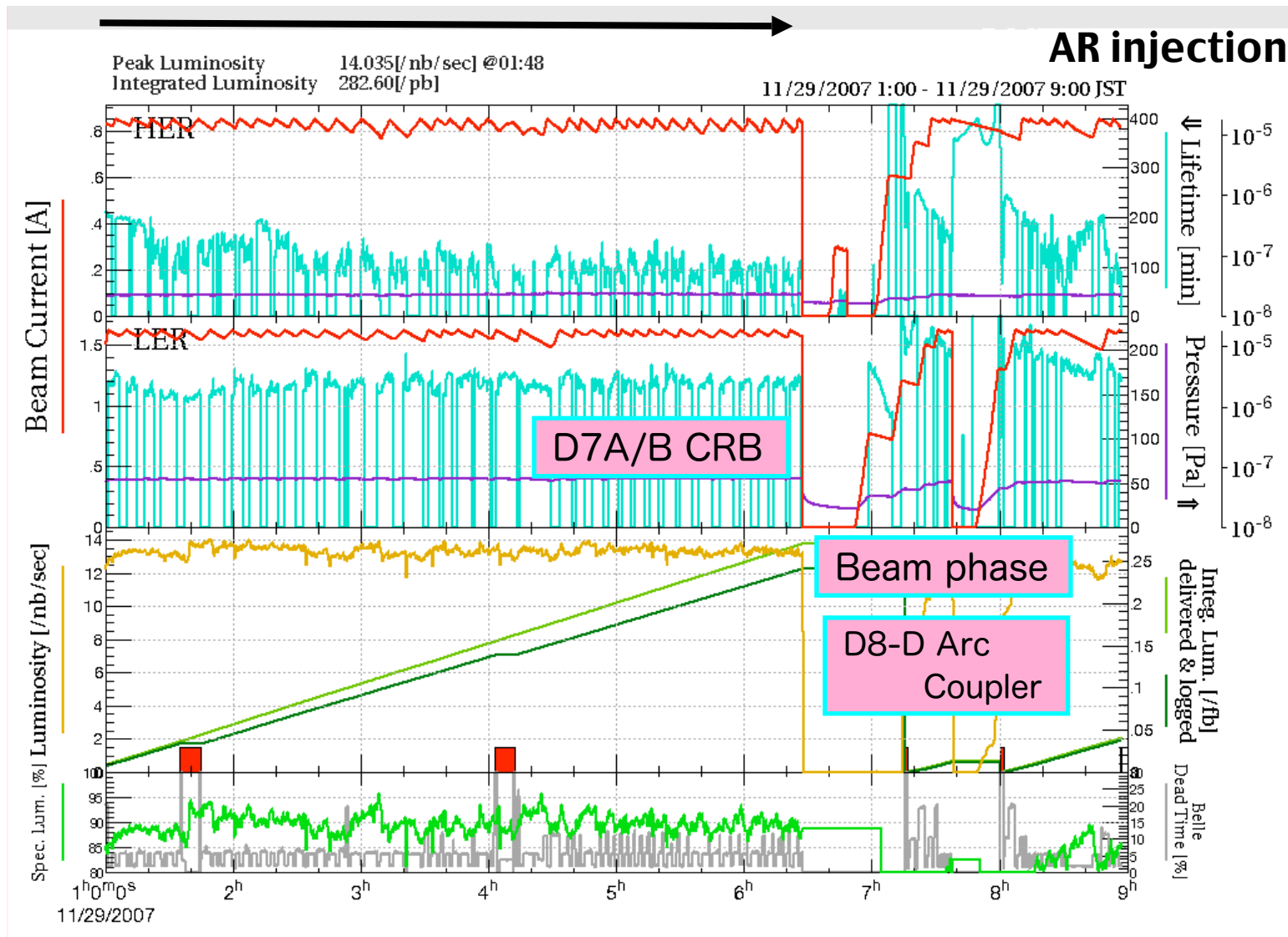
Beam Current : LER **1620** mA / HER **850** mA

Fill pattern : 3.06 spacing, 1trains, 1584+1
 bunches

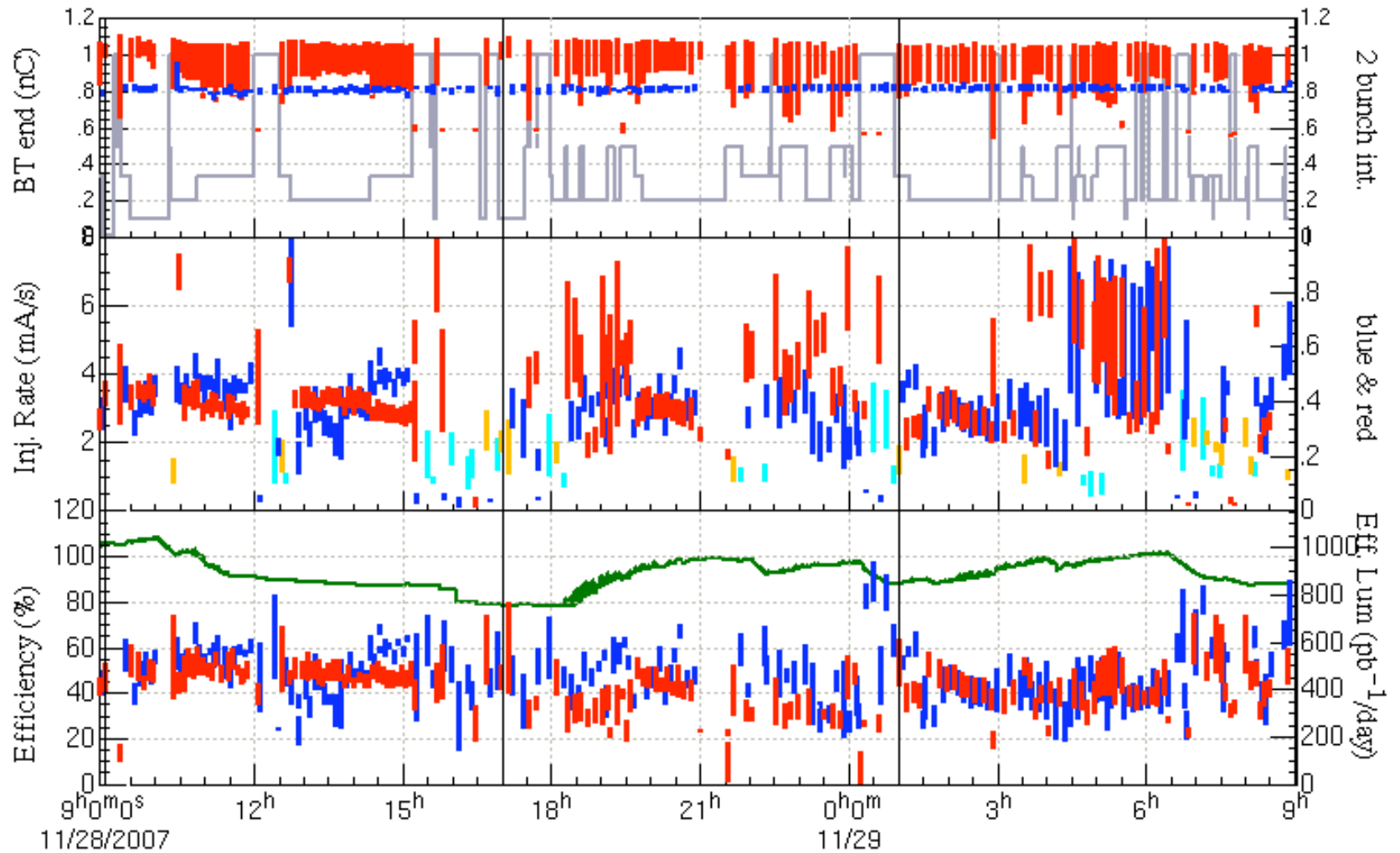
Aborts : LER_{only} : **2** / HER_{only} : **1**_{MA} / Both : **1**₁

Shift Summary

Size-minimum simplex for HER



Injection Summary

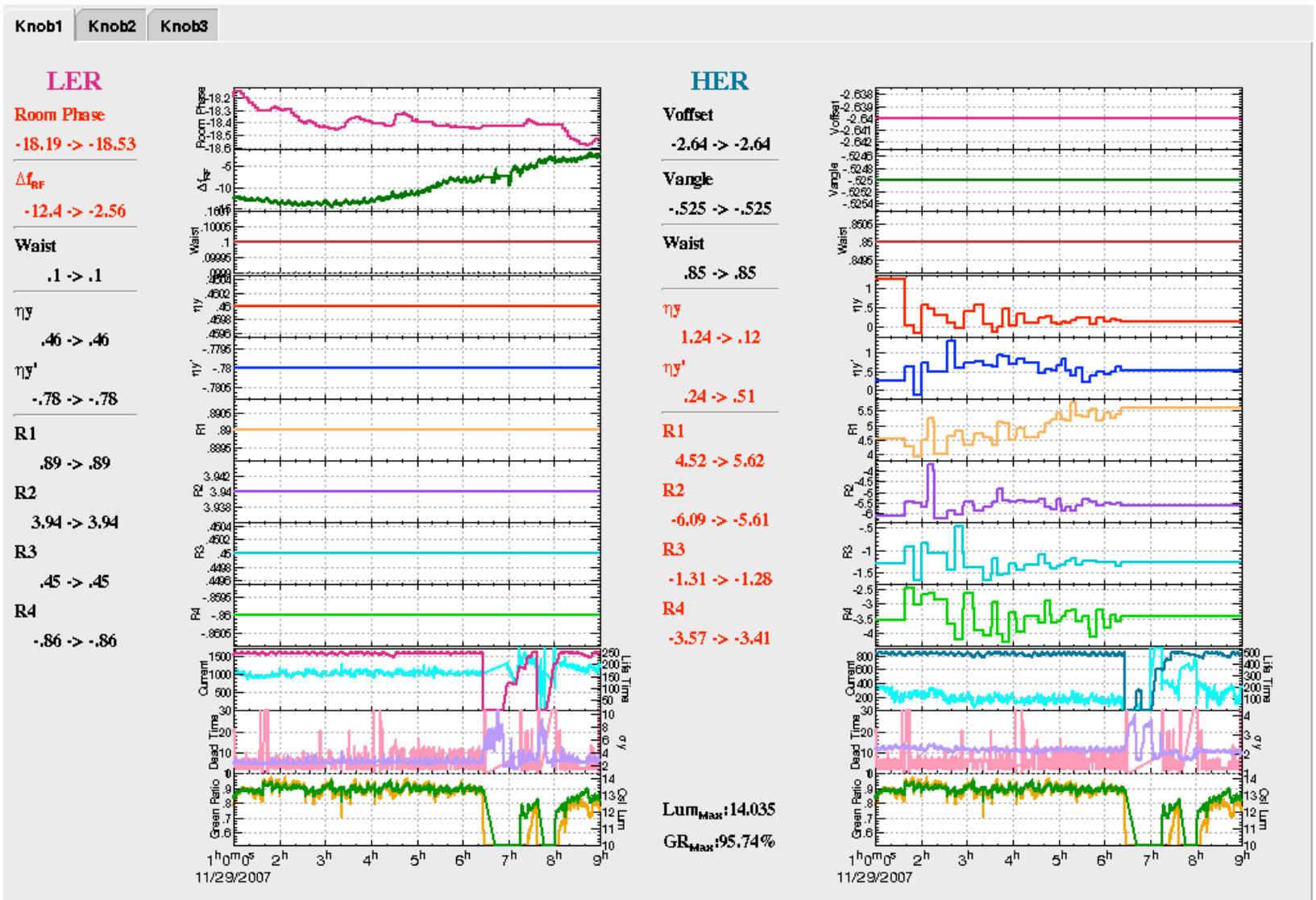


Tuning Items

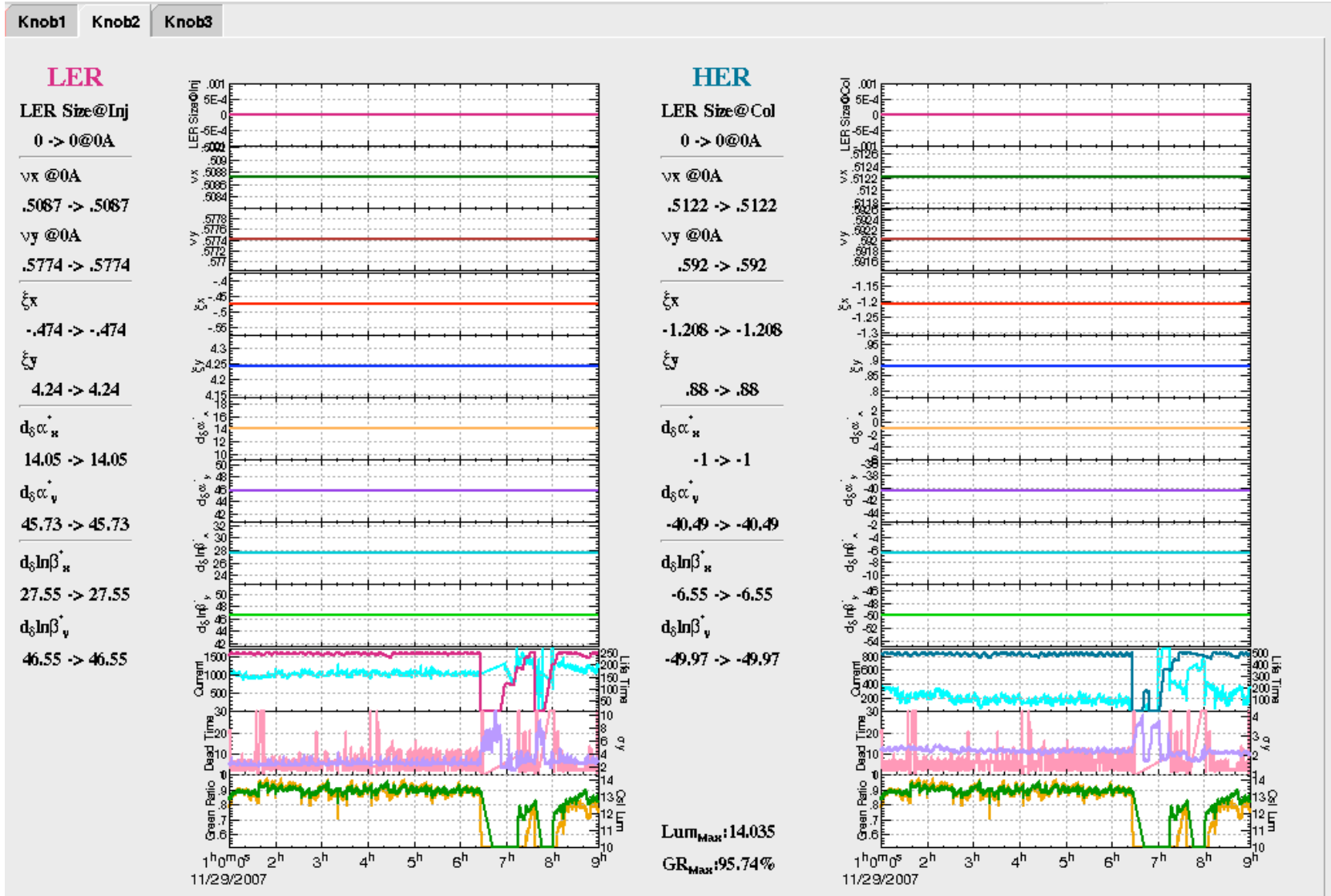
1. Size-minimum simplex for HER

	LER	HER
R_1		4.52 \Rightarrow 5.62
R_2		-6.09 \Rightarrow -5.61
R_3		-1.31 \Rightarrow -1.28
R_4		-3.57 \Rightarrow -3.41
η_y^*		1.24 \Rightarrow 0.12
$\eta_y^{*'} $		0.24 \Rightarrow 0.51
η_x^*		
$\eta_x^{*'} $		
R_5		

Knob 1



Knob 2



Knob 3

Knob1 Knob2 Knob3

LER

Offset

.7 -> .698

R2(Crab)

5 -> 5

R4(Crab)

-.49 -> -.49

ηy (SX)

-2.6E-4 -> -2.6E-4

$\eta y'$ (SX)

.013 -> .013

R1(SX)

-.003 -> -.003

R2(SX)

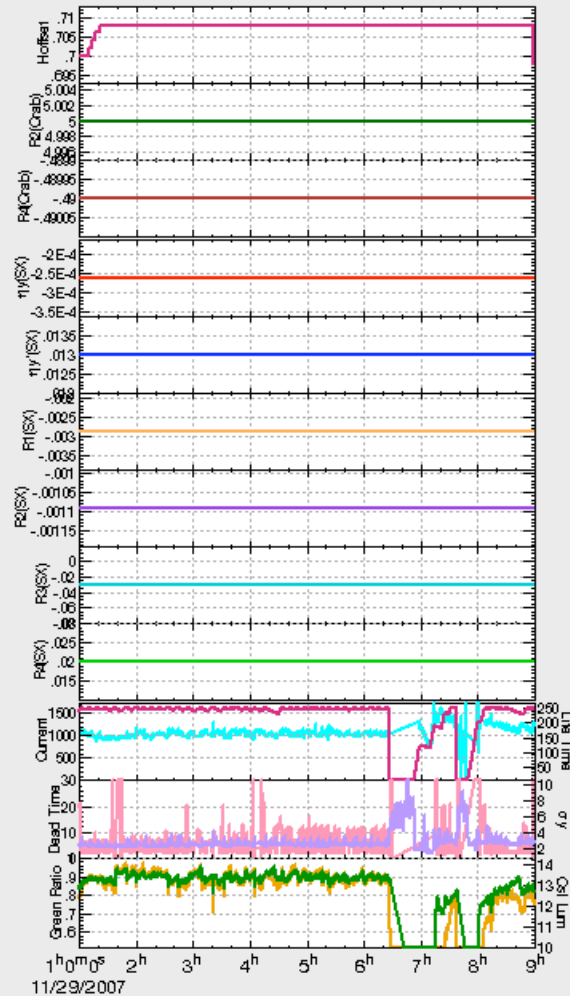
-.001 -> -.001

R3(SX)

-.031 -> -.031

R4(SX)

.02 -> .02



HER

Angle

0 -> 0

R2(Crab)

-3.44 -> -3.44

R4(Crab)

-1 -> -1

ηy (SX)

-3E-4 -> -3E-4

$\eta y'$ (SX)

-.021 -> -.021

R1(SX)

-.002 -> -.002

R2(SX)

.002 -> .002

R3(SX)

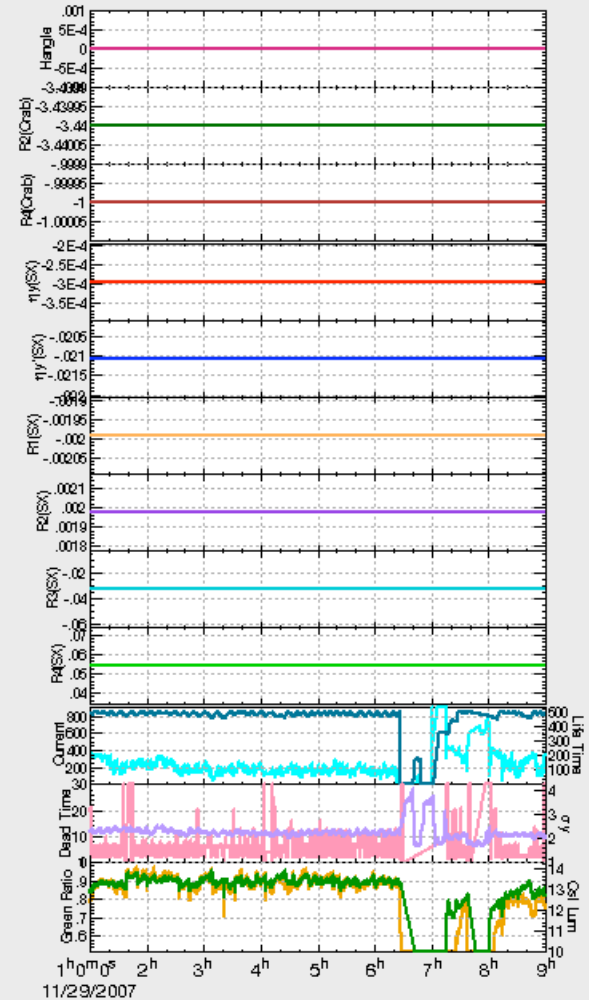
-.033 -> -.033

R4(SX)

.054 -> .054

Lum_{Max}: 14.035

GR_{Max}: 95.74%



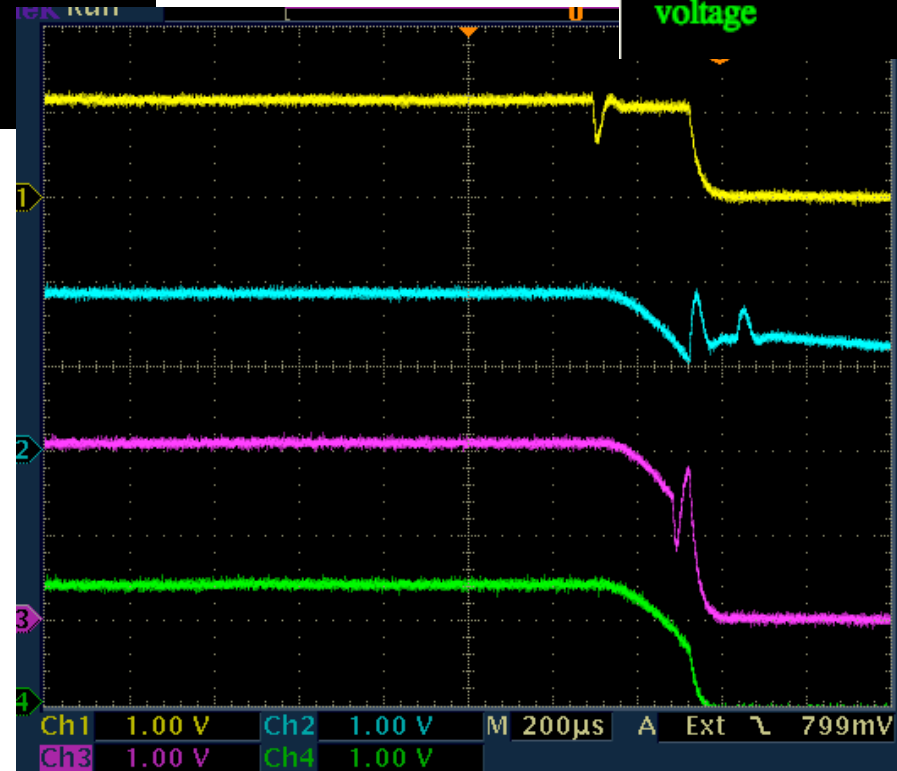
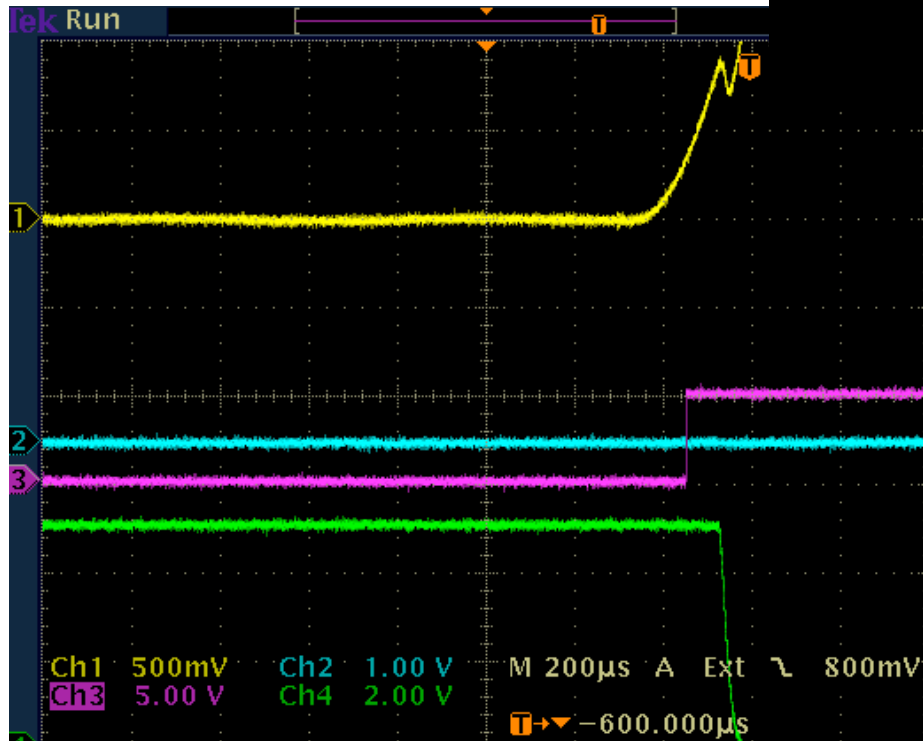
Comments

Troubles

1. 6:27 Abort both rings: Klystron D7-A/B CRB Work

LER beam phase
D07-A cavity
voltage
BPA Req.
LER beam
current

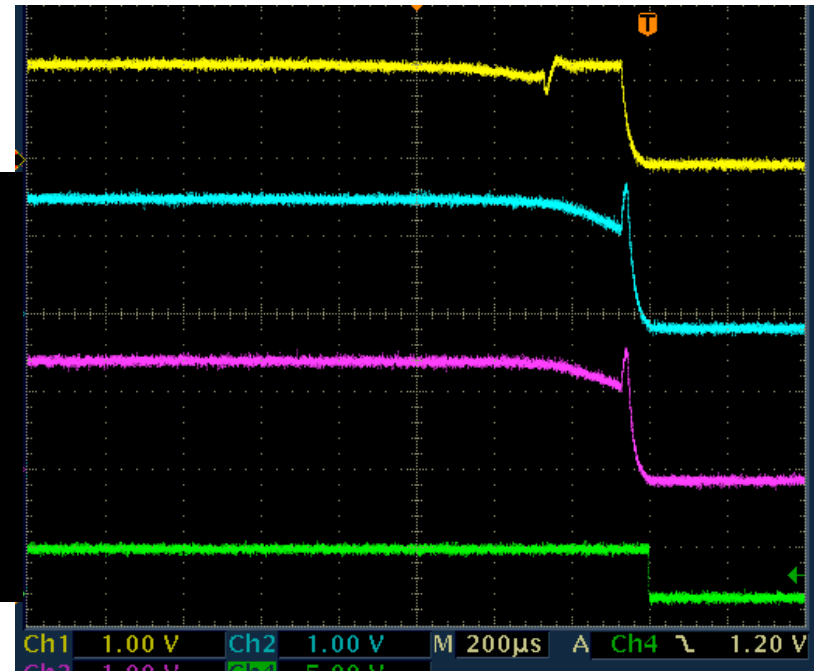
D07-B cavity
voltage
D07-C cavity
voltage
D07-D cavity
voltage
D07-E cavity
voltage



Troubles

2. 7:36 Abort LER only
Beam Phase Abort

D08-C cavity
voltage
D08-D cavity
voltage
D08-E cavity
voltage
Trigger (LER
DCCT)



3. 7:42 Abort LER only
D8-D Arc Coupler CAV#1-AIR

Operationに関する感想、提案など

終わり