

Measurements of  $\beta^*$  in Store for RHIC Run-10  
Using AC Dipole

M. Bai and G. Wang

## Results of ac dipole data analysis for store 11712(Blue) and 11311 (Yellow)

	IP2			IP4			IP6			IP8			IP10			IP12		
	Beta*	Error	S*	Beta*	Error	S*	Beta*	Error	S*	Beta*	Error	S*	Beta*	Error	S*	Beta*	Error	S*
Blue V	3.142	0.02	-0.386	4.77	0.018	0.502	0.65	0.042	-0.12	0.625	0.042	-0.192	4.02	0.0182	0.137	3.818	0.019	-0.21
Blue H	3.552	0.02	-0.649	4.26	0.02	-0.76	0.62	0.044	-0.01	0.695	0.043	-0.3	3.787	0.0203	-0.72	4.455	0.019	-0.66
Yellow V	4.355	0.02	-0.925	3.28	0.033	-0.36	0.815	0.022	0.15	0.995	0.01	-2.705	3.14	0.0185	0.395	3.355	0.018	0.42

- Blue results are obtained by taking the average of results for excitation above and below betatron tune.
- Yellow vertical results are obtained by taking the average of two data sets. Both of them are for excitation above betatron tune. (We lost beam when exciting beam on the other side.)
- No useful Yellow horizontal data were taken.
- LOptics had an bug at the time of data taking, which led to wrong scaling of beta function.

File Lattice SetUp Help

Betatron/Phase Advance Beta Beat

PS State  
 Horizontal Off-Error    
 Vertical Off

Setup/Betatron Tunes

	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2433	0.0000	40.000	20.000	60.000	0.2302
V:	0.2240	0.0800	40.000	20.000	40.000	0.2148

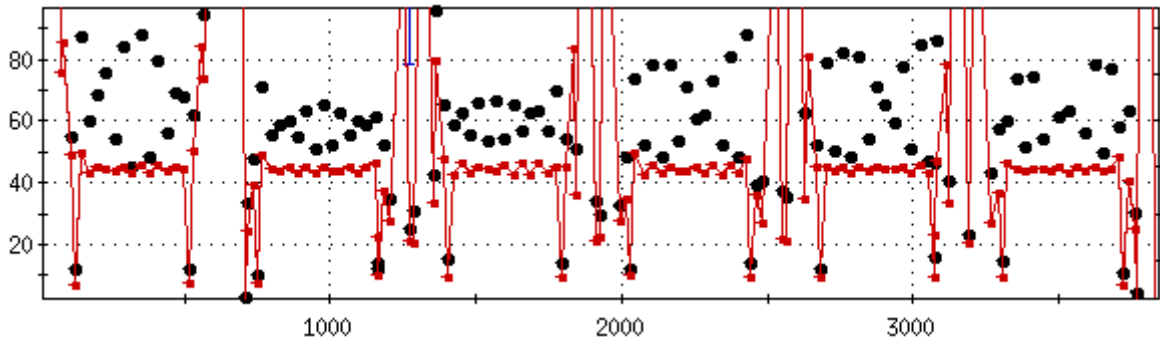
Accumulate Average

Beam ==> Lattice: Blue

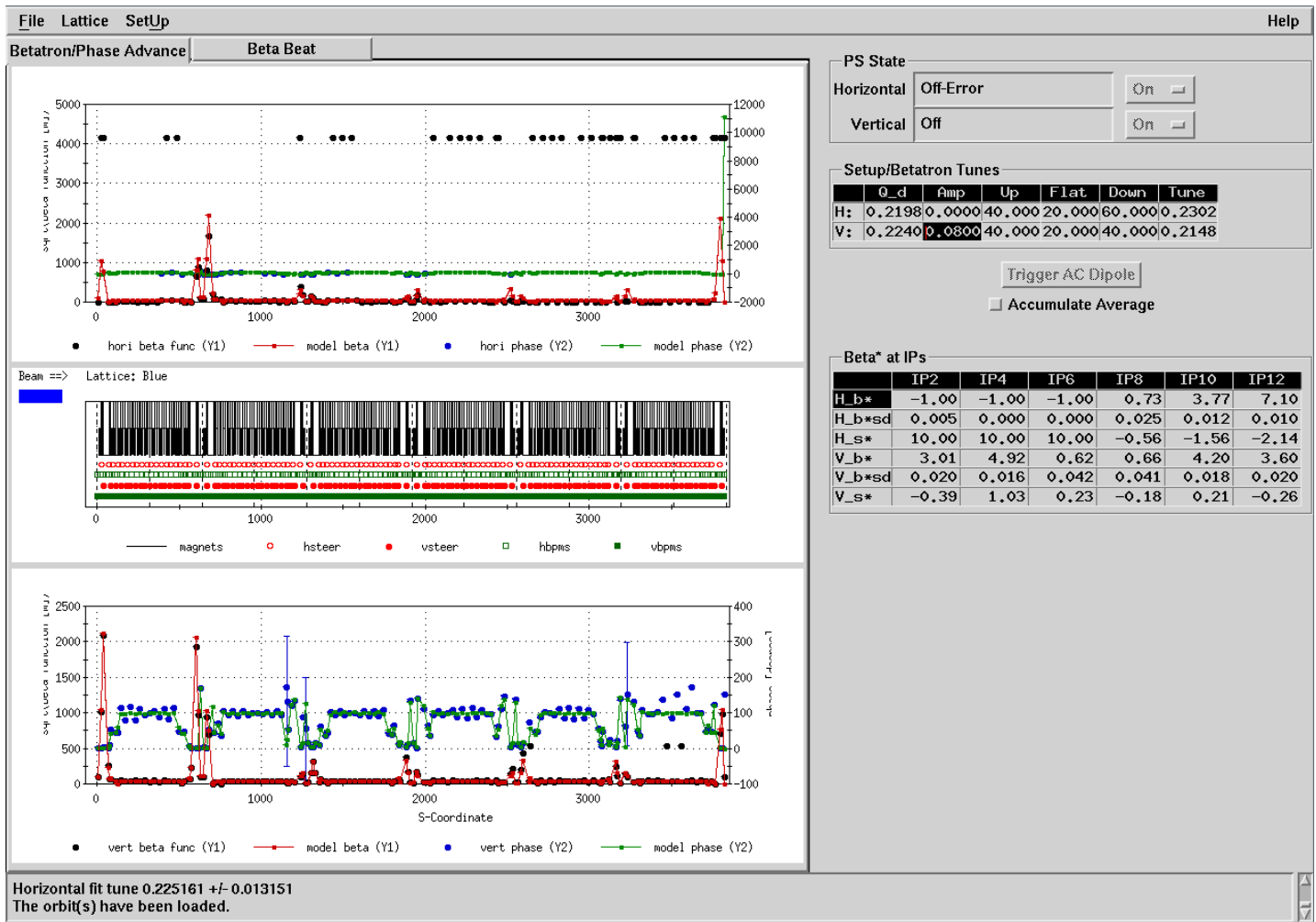
Legend: magnets (black line), hsteer (red circle), vsteer (blue circle), hbpm (green square), vbpm (black square)

Horizontal fit tune 0.225161 +/- 0.013151  
 The orbit(s) have been loaded.

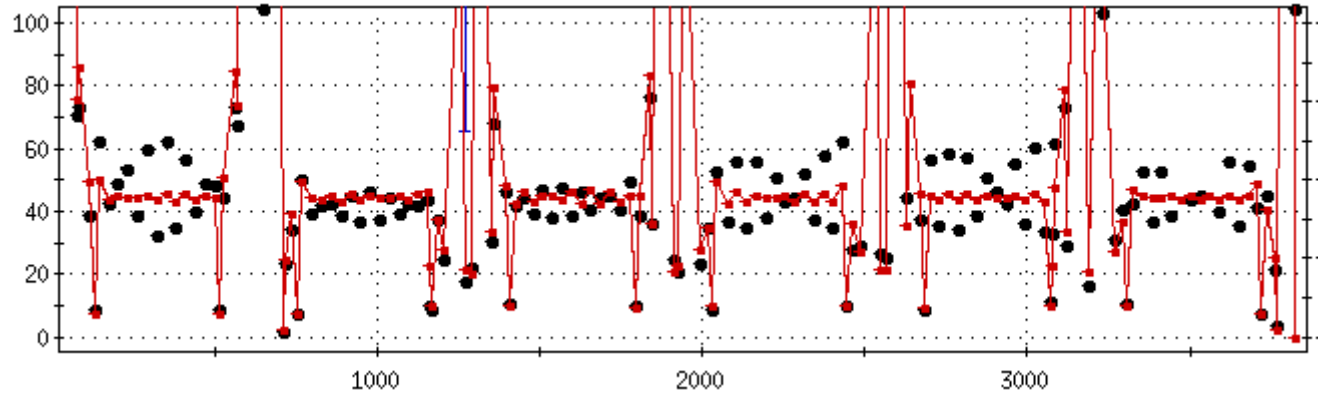
**Bad bpms are used to calculate average beta function in arcs, which cause wrong scaling!**



Wrong scaling!  
 11172 Vacd\_store\_06



After excluding  
bpm's with bad  
status from  
calculating average  
beta function...



11172 Vacd\_store\_06

File Lattice SetUp Help

Betatron/Phase Advance Beta Beat

PS State  
 Horizontal Off-Error On   
 Vertical Off On

Setup/Betatron Tunes

	Q <sub>d</sub>	Amp	Up	Flat	Down	Tune
H:	0.2230	0.0000	40.000	20.000	60.000	0.2337
V:	0.2230	0.0500	40.000	20.000	40.000	0.2120

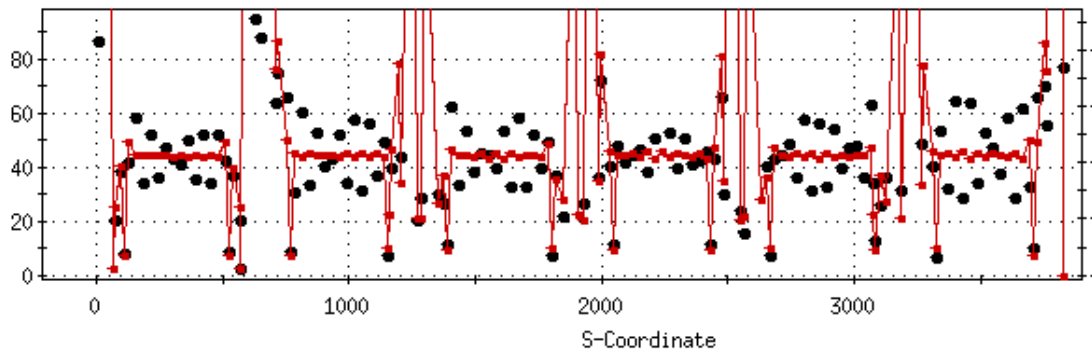
Trigger AC Dipole  Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
H_b*sd	0.000	0.000	0.000	0.000	0.000	0.000
H_s*	10.00	10.00	10.00	10.00	10.00	10.00
V_b*	3.85	-1.00	0.82	0.60	3.17	3.57
V_b*sd	0.015	0.008	0.012	0.007	0.017	0.015
V_s*	-0.86	10.00	1.09	2.82	0.41	0.79

Beam <== Lattice: Yellow

Horizontal fit tune 0.229721 +/- 0.041497  
 The orbit(s) have been loaded.



11311 Vacd\_store\_02

File Lattice SetUp Help

Betatron/Phase Advance Beta Beat

● hori beta func (Y1)    ● model beta (Y1)    ● hori phase (Y2)    ● model phase (Y2)

Beam <== Lattice: Yellow

— magnets    ○ hsteer    ● vsteer    □ hbpm    ■ vbpm

● vert beta func (Y1)    ● model beta (Y1)    ● vert phase (Y2)    ● model phase (Y2)

Horizontal fit tune 0.229127 +/- 0.044228  
The orbit(s) have been loaded.

PS State

Horizontal Off-Error  On

Vertical Off  On

Setup/Betatron Tunes

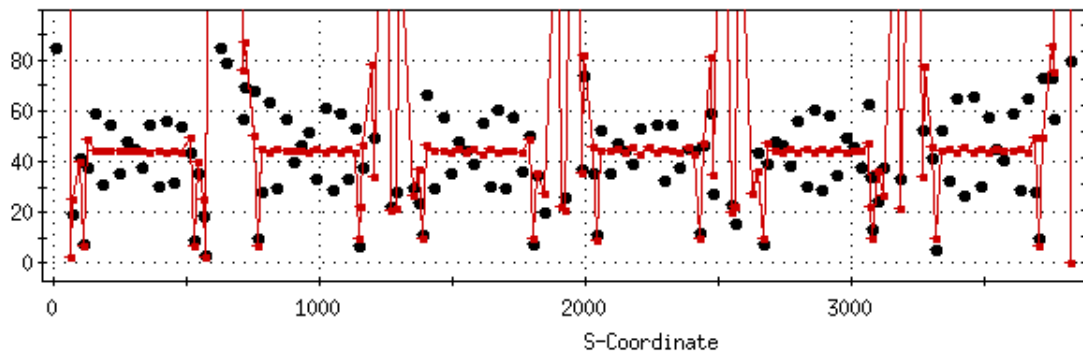
	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2230	0.0000	40.000	20.000	60.000	0.2337
V:	0.2230	0.0800	40.000	20.000	40.000	0.2120

Trigger AC Dipole

Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
H_b*sd	0.000	0.000	0.000	0.000	0.000	0.000
H_s*	10.00	10.00	10.00	10.00	10.00	10.00
V_b*	4.19	3.13	0.82	0.99	3.02	3.35
V_b*sd	0.022	0.032	0.022	0.009	0.015	0.016
V_s*	-1.37	-0.29	0.89	-2.00	0.62	0.62



11311 Vacd\_store\_03

File Lattice SetUp Help

Betatron/Phase Advance Beta Beat

● hori beta func (Y1) ● model beta (Y1) ● hori phase (Y2) ● model phase (Y2)

Beam <== Lattice: Yellow

— magnets ○ hsteer ● vsteer □ hbpms ■ vbpm

● vert beta func (Y1) ● model beta (Y1) ● vert phase (Y2) ● model phase (Y2)

Horizontal fit tune 0.226581 +/- 0.030380  
The orbit(s) have been loaded.

PS State

Horizontal Off-Error On

Vertical Off On

Setup/Betatron Tunes

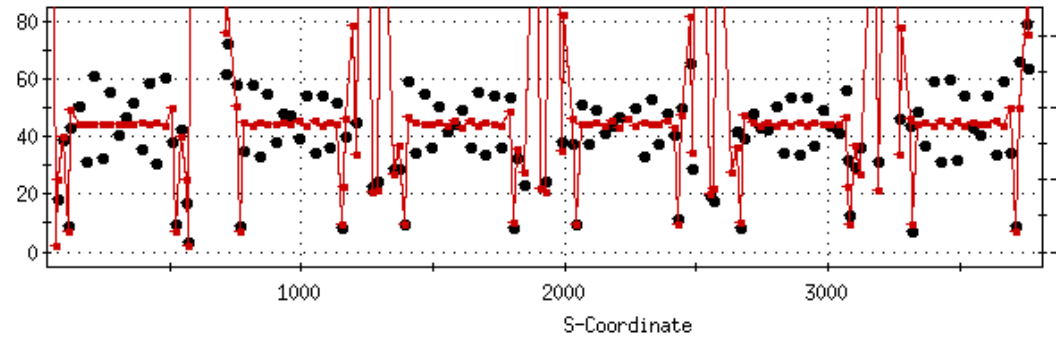
	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2230	0.0000	40.000	20.000	60.000	0.2337
V:	0.2240	0.1000	40.000	20.000	40.000	0.2120

Trigger AC Dipole

Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
H_b*sd	0.000	0.000	0.000	0.000	0.000	0.000
H_s*	10.00	10.00	10.00	10.00	10.00	10.00
V_b*	4.52	3.42	0.81	1.00	3.26	3.36
V_b*sd	0.020	0.033	0.021	0.011	0.022	0.020
V_s*	-0.48	-0.43	-0.59	-3.41	0.17	0.22



11311 Vacd\_store\_04

File Lattice SetUp Help

Betatron/Phase Advance Beta Beat

● hori beta func (Y1)    — model beta (Y1)    ● hori phase (Y2)    — model phase (Y2)

Beam => Lattice: Blue

— magnets    ○ hsteer    ● vsteer    □ hbpm    ■ vbpm

● vert beta func (Y1)    — model beta (Y1)    ● vert phase (Y2)    — model phase (Y2)

Horizontal fit tune 0.239902 +/- 0.000005  
The orbit(s) have been loaded.

PS State

Horizontal Off-Error On

Vertical Off On

Setup/Betatron Tunes

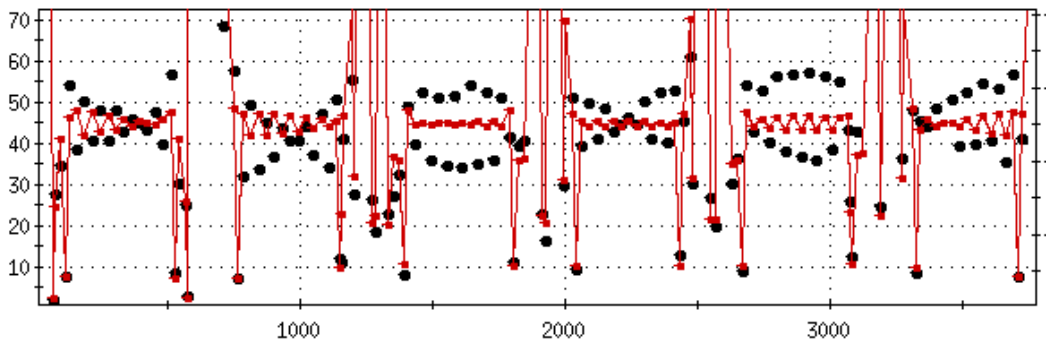
	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2399	0.1500	40.000	20.000	60.000	0.2299
V:	0.2240	0.0000	40.000	20.000	40.000	0.2148

Trigger AC Dipole

Accumulate Average

Beta\* at IPs

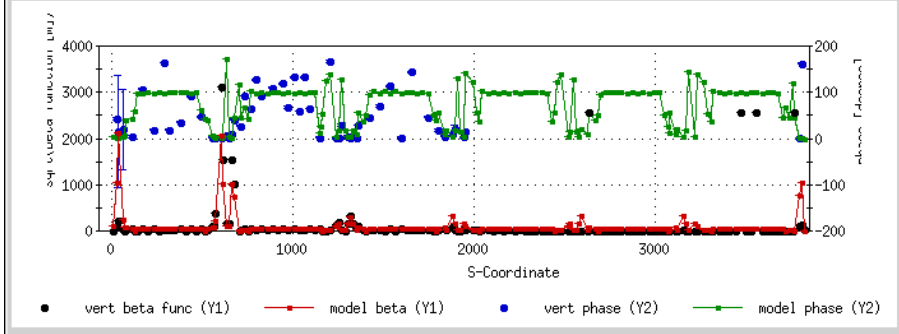
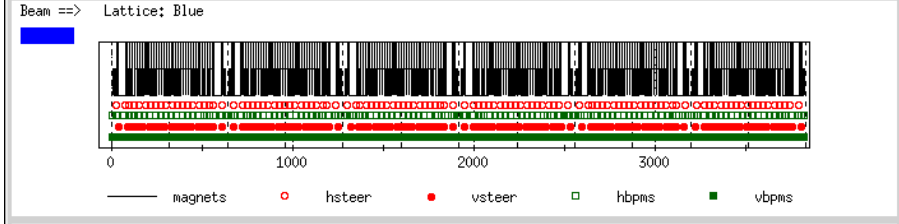
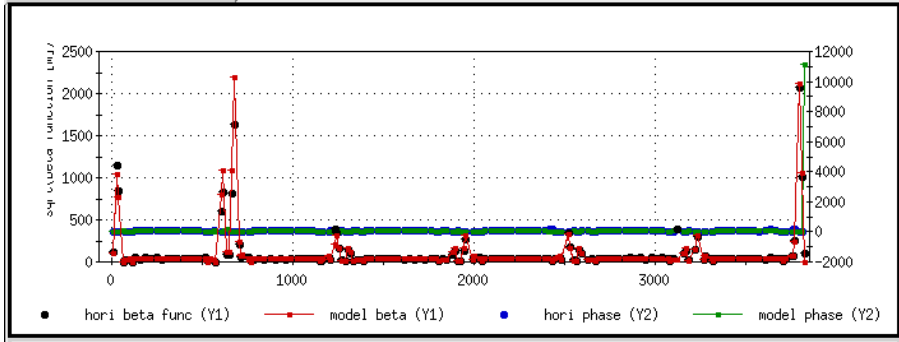
	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	3.50	4.04	0.58	0.70	3.77	4.56
H_b*sd	0.033	0.031	0.078	0.082	0.035	0.030
H_s*	-0.76	0.20	-0.55	-0.22	-0.83	-0.66
V_b*	-1.00	-1.00	-1.00	0.47	4.30	-1.00
V_b*sd	0.004	0.003	0.000	0.015	0.006	0.005
V_s*	10.00	10.00	10.00	-0.09	-1.75	10.00



11172 Hacd\_store\_01



Betatron/Phase Advance Beta Beat



Horizontal fit tune 0.239904 +/- 0.000005  
The orbit(s) have been loaded.

PS State

Horizontal Off-Error

Vertical Off

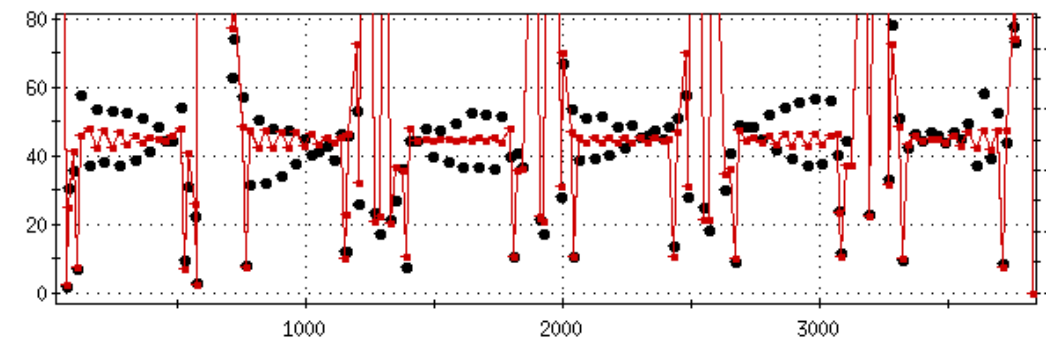
Setup/Betatron Tunes

	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2399	0.1500	40.000	20.000	60.000	0.2299
V:	0.2240	0.0000	40.000	20.000	40.000	0.2148

Accumulate Average

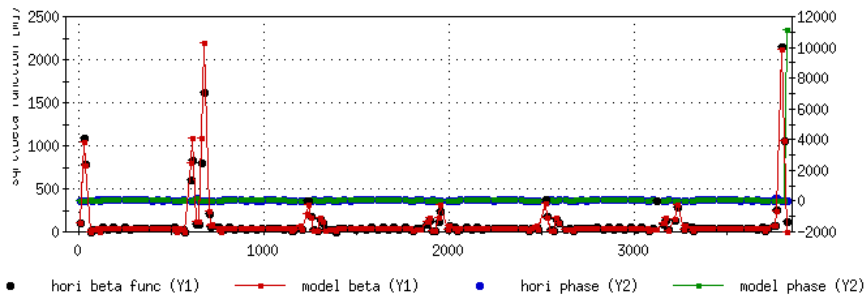
Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	3.85	4.37	0.58	0.76	4.13	4.78
H_b*sd	0.029	0.026	0.071	0.071	0.030	0.030
H_s*	-0.83	0.36	0.79	-0.21	-0.89	-0.26
V_b*	-1.00	-1.00	-1.00	0.41	3.65	-1.00
V_b*sd	0.004	0.004	0.005	0.019	0.008	0.005
V_s*	10.00	10.00	10.00	-0.03	-1.62	10.00

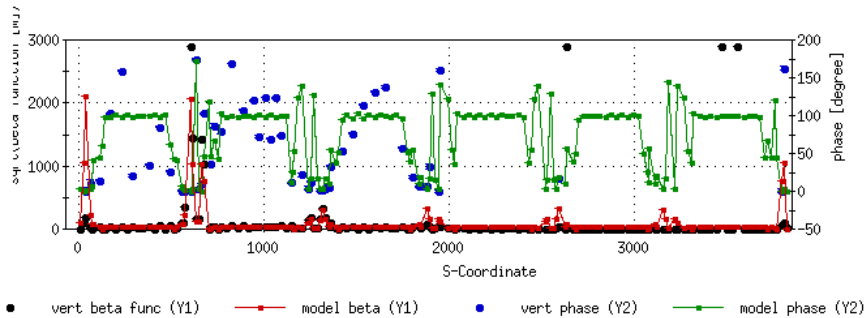
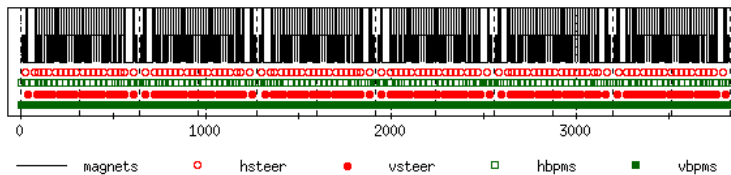


11172 Hacd\_store\_02

Betatron/Phase Advance Beta Beat



Beam ==> Lattice: Blue



PS State

Horizontal Off-Error

Vertical Off

Setup/Betatron Tunes

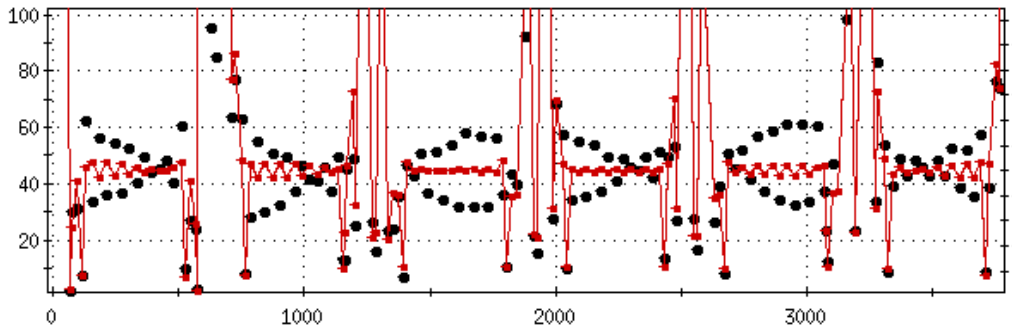
	Q <sub>d</sub>	Amp	Up	Flat	Down	Tune
H:	0.2410	0.1600	40.000	20.000	60.000	0.2299
V:	0.2240	0.0000	40.000	20.000	40.000	0.2148

Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H <sub>b</sub> *	3.75	4.63	0.58	0.77	3.99	5.27
H <sub>b</sub> *sd	0.018	0.017	0.041	0.039	0.018	0.015
H <sub>s</sub> *	-1.17	-0.01	0.18	-0.29	-1.25	-0.68
V <sub>b</sub> *	-1.00	-1.00	-1.00	0.44	3.62	-1.00
V <sub>b</sub> *sd	0.005	0.003	0.005	0.013	0.007	0.004
V <sub>s</sub> *	10.00	10.00	10.00	-0.08	-1.15	10.00

Horizontal fit tune 0.240998 +/- 0.000006  
The orbit(s) have been loaded.



11172 Hacd\_store\_03

File Lattice SetUp Help

Betatron/Phase Advance Beta Beat

● hori beta func (Y1) — model beta (Y1) ● hori phase (Y2) — model phase (Y2)

Beam ==> Lattice: Blue

— magnets ○ hsteer ● vsteer □ hbps ■ vbps

● vert beta func (Y1) — model beta (Y1) ● vert phase (Y2) — model phase (Y2)

Horizontal fit tune 0.240998 +/- 0.000006  
The orbit(s) have been loaded.

PS State

Horizontal Off-Error  On

Vertical Off  On

Setup/Betatron Tunes

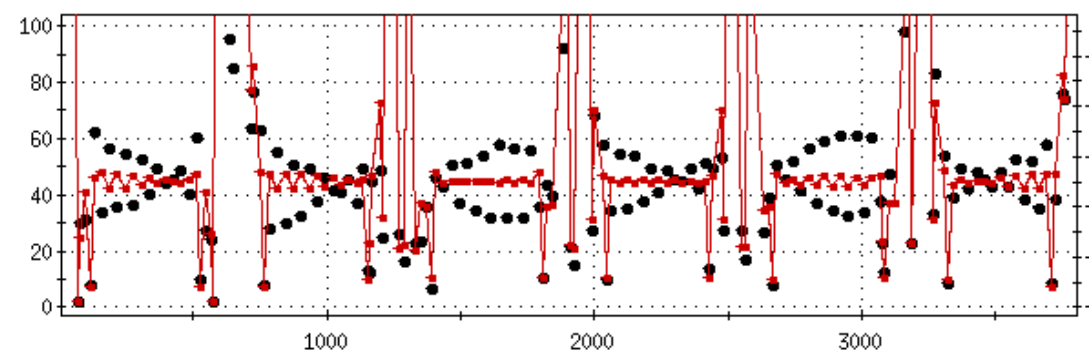
	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2410	0.1600	40.000	20.000	60.000	0.2299
V:	0.2240	0.0000	40.000	20.000	40.000	0.2148

Trigger AC Dipole

Accumulate Average

Beta\* at IPs

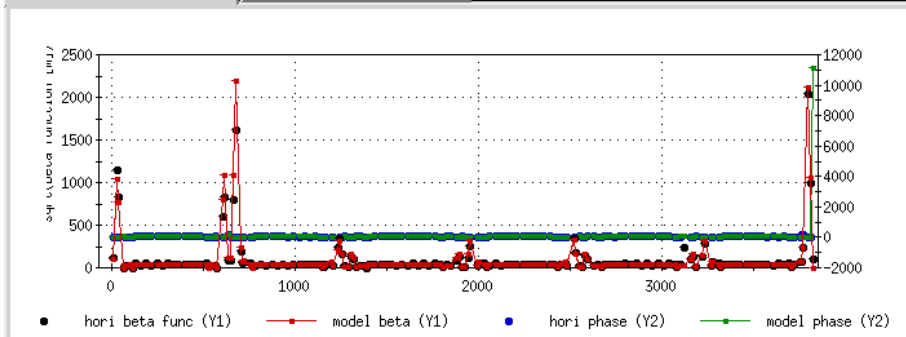
	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	3.75	4.63	0.58	0.77	3.99	5.27
H_b*sd	0.018	0.017	0.041	0.039	0.018	0.015
H_s*	-1.17	-0.01	0.18	-0.29	-1.25	-0.68
V_b*	-1.00	-1.00	-1.00	0.44	3.62	-1.00
V_b*sd	0.005	0.003	0.005	0.013	0.007	0.004
V_s*	10.00	10.00	10.00	-0.08	-1.15	10.00



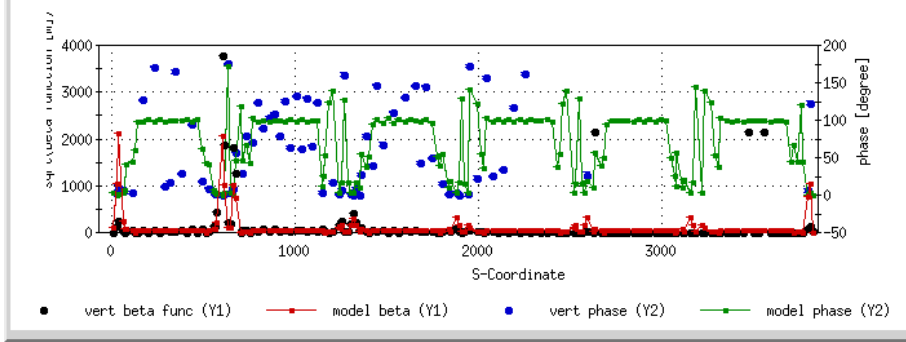
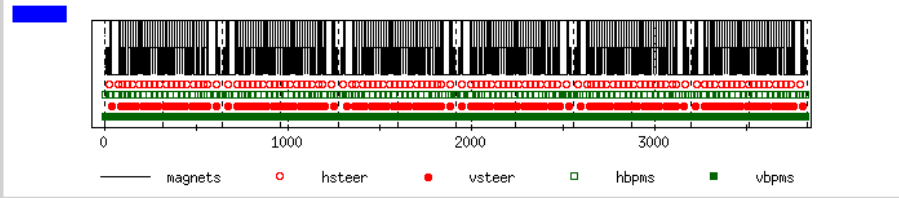
11172 Hacd\_store\_04

Betatron/Phase Advance

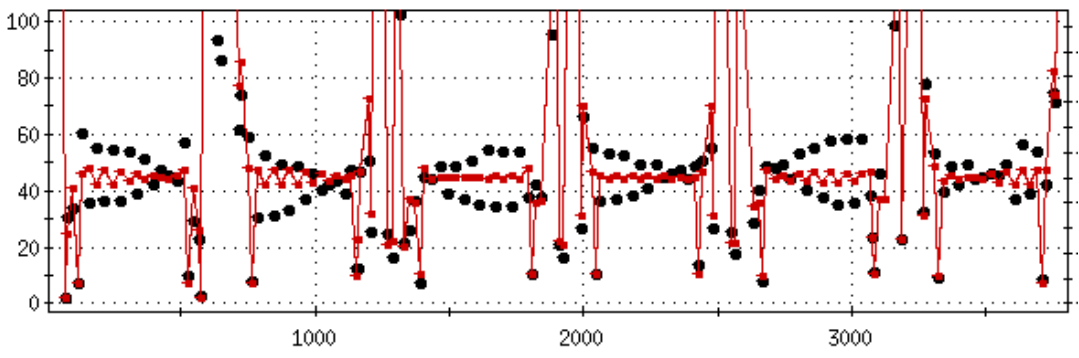
Beta Beat



Beam ==> Lattice: Blue



Horizontal fit tune 0.239906 +/- 0.000008  
The orbit(s) have been loaded.



PS State

Horizontal Off-Error

Vertical Off

Setup/Betatron Tunes

	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2399	0.1700	40.000	20.000	60.000	0.2299
V:	0.2240	0.0000	40.000	20.000	40.000	0.2148

Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	3.86	4.56	0.58	0.77	4.15	4.99
H_b*sd	0.029	0.025	0.069	0.067	0.031	0.024
H_s*	-1.03	0.13	0.84	-0.25	-1.03	-0.43
V_b*	-1.00	-1.00	-1.00	-1.00	2.92	-1.00
V_b*sd	0.006	0.003	0.006	0.000	0.007	0.007
V_s*	10.00	10.00	10.00	10.00	-1.77	10.00

11172 Hacd\_store\_05

File Lattice SetUp Help

Betatron/Phase Advance Beta Beat

PS State  
 Horizontal Off-Error    
 Vertical Off

Setup/Betatron Tunes

	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2198	0.0800	40.000	20.000	60.000	0.2302
V:	0.2240	0.0000	40.000	20.000	40.000	0.2148

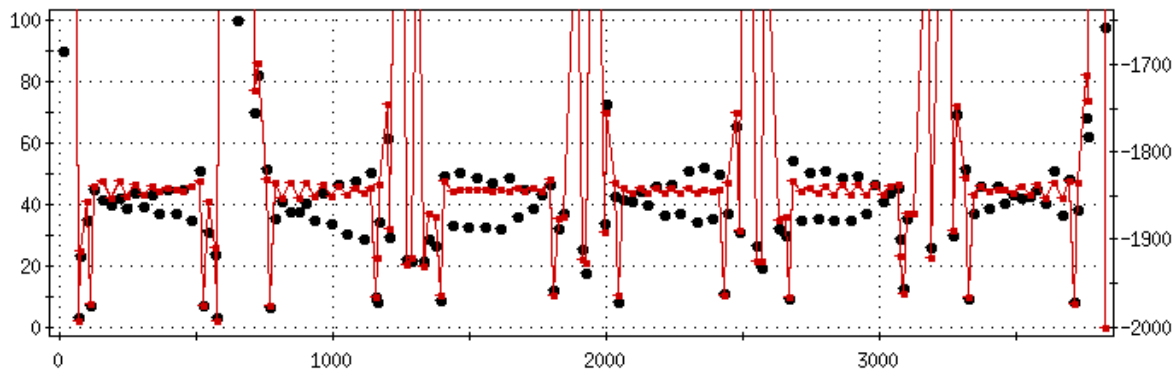
Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	3.63	4.33	0.69	0.66	3.70	4.24
H_b*sd	0.008	0.011	0.010	0.009	0.008	0.011
H_s*	-0.21	-1.94	-0.18	-0.35	-0.35	-0.33
V_b*	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
V_b*sd	0.009	0.000	0.008	0.007	0.007	0.003
V_s*	10.00	10.00	10.00	10.00	10.00	10.00

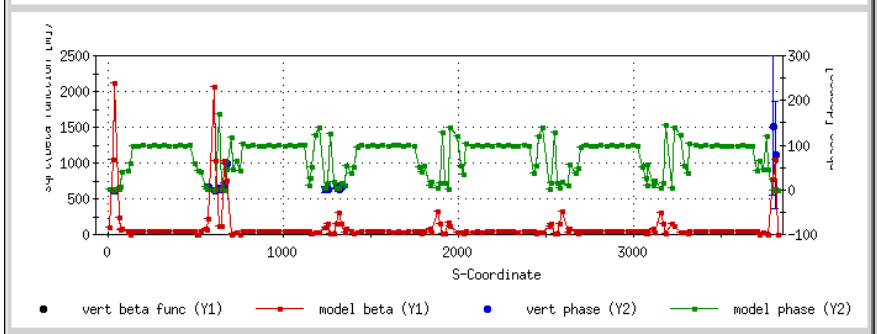
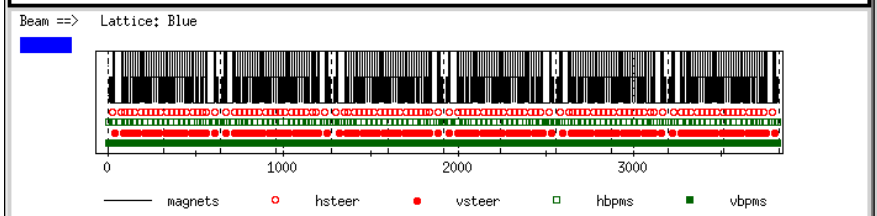
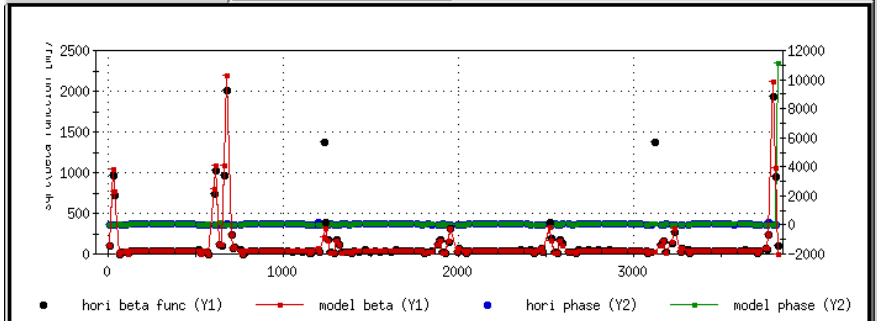
Beam => Lattice: Blue

Horizontal fit tune 0.219795 +/- 0.000023  
 The orbit(s) have been loaded.



11172 Hacd\_store\_06

Betatron/Phase Advance Beta Beat



Horizontal fit tune 0.219796 +/- 0.000027  
The orbit(s) have been loaded.

PS State

Horizontal Off-Error

Vertical Off

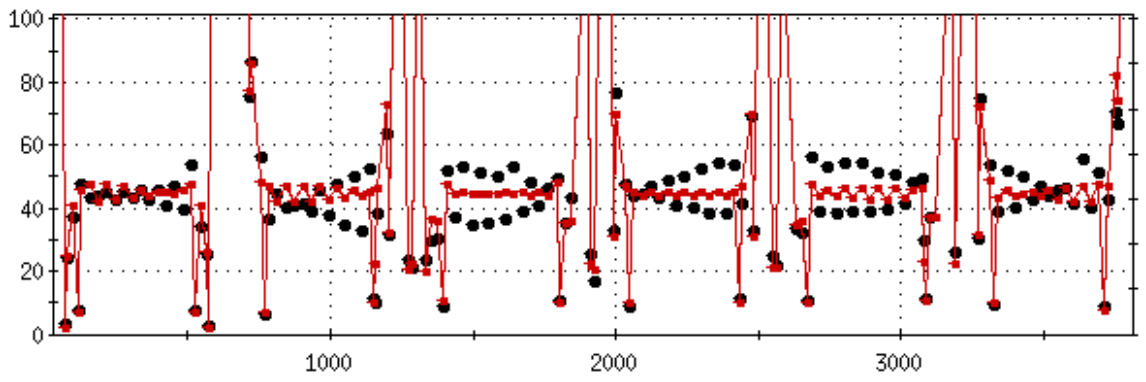
Setup/Betatron Tunes

	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2198	0.0800	40.000	20.000	60.000	0.2299
V:	0.2240	0.0000	40.000	20.000	40.000	0.2148

Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	3.38	4.20	0.65	0.63	3.53	3.96
H_b*sd	0.009	0.010	0.011	0.013	0.009	0.011
H_s*	-0.30	-1.48	0.08	-0.35	-0.45	-1.06
V_b*	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
V_b*sd	0.008	0.005	0.009	0.006	0.008	0.010
V_s*	10.00	10.00	10.00	10.00	10.00	10.00



11172 Hacd\_store\_07

File Lattice SetUp Help

Betatron/Phase Advance    Beta Beat



2500  
2000  
1500  
1000  
500  
0  
-500  
-1000  
-1500  
-2000

0 1000 2000 3000

● hori beta func (Y1)    ● model beta (Y1)    ● hori phase (Y2)    ● model phase (Y2)

PS State  
Horizontal Off-Error    On   
Vertical Off    On

Setup/Betatron Tunes

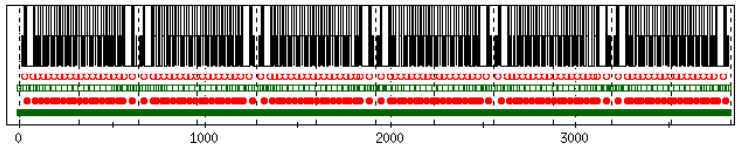
	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2198	0.1200	40.000	20.000	60.000	0.2302
V:	0.2240	0.0000	40.000	20.000	40.000	0.2148

Trigger AC Dipole  
 Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	3.08	3.85	0.64	0.63	3.46	3.83
H_b*sd	0.021	0.023	0.051	0.041	0.019	0.019
H_s*	-0.54	-1.63	-0.89	-0.37	-0.50	-1.05
V_b*	-1.00	-1.00	1.45	-1.00	3.08	-1.00
V_b*sd	0.010	0.007	0.039	0.000	0.024	0.012
V_s*	10.00	10.00	-0.19	10.00	-0.73	10.00

Beam => Lattice: Blue



0 1000 2000 3000

— magnets    ○ hsteer    ● vsteer    □ hbpas    ■ vbpas



4000  
3000  
2000  
1000  
0  
-500

0 1000 2000 3000

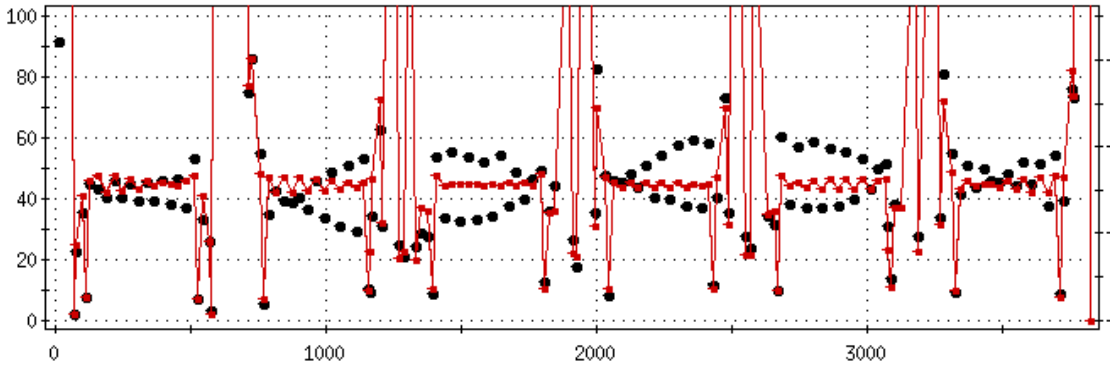
● vert beta func (Y1)    ● model beta (Y1)    ● vert phase (Y2)    ● model phase (Y2)

Phase [degree]

200  
150  
100  
50  
0  
-50

S-Coordinate

Loading Orbit 1 of 1 - Hacd\_store\_08.sdds  
Vertical fit tune 0.220316 +/- 0.006673



11172 Hacd\_store\_08

File Lattice SetUp Help

Betatron/Phase Advance    Beta Beat

PS State  
 Horizontal Off-Error    On   
 Vertical Off    On

Setup/Betatron Tunes

	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2399	0.0000	40.000	20.000	60.000	0.2302
V:	0.2240	0.0800	40.000	20.000	40.000	0.2148

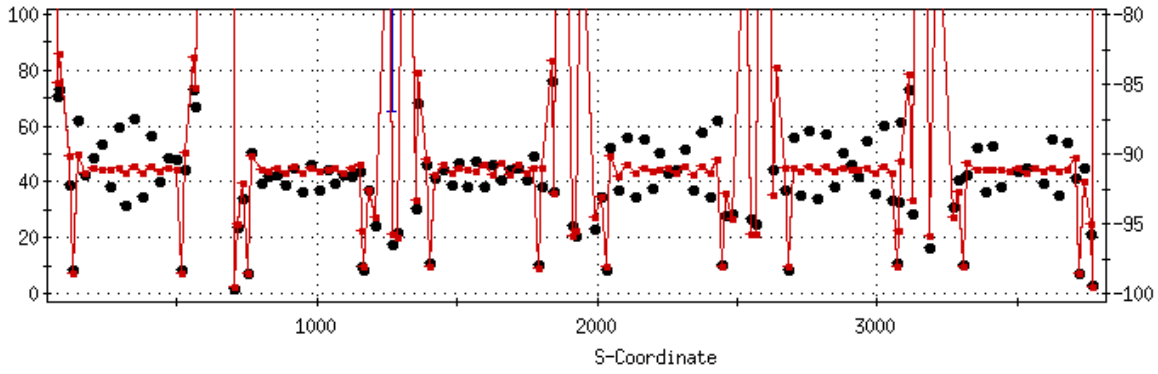
Trigger AC Dipole  
 Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	-1.00	-1.00	-1.00	0.73	3.77	7.10
H_b*sd	0.005	0.000	0.000	0.025	0.012	0.010
H_s*	10.00	10.00	10.00	-0.56	-1.56	-2.14
V_b*	3.01	4.92	0.62	0.66	4.20	3.60
V_b*sd	0.020	0.016	0.042	0.041	0.018	0.020
V_s*	-0.39	1.03	0.23	-0.18	0.21	-0.26

Beam ==> Lattice: Blue

Horizontal fit tune 0.225161 +/- 0.013151  
 The orbit(s) have been loaded.



11172 Vacd\_store\_06



File Lattice SetUp Help

Betatron/Phase Advance Beta Beat

• hori beta func (Y1)    • model beta (Y1)    • hori phase (Y2)    • model phase (Y2)

Beam ==> Lattice: Blue

— magnets    ○ hsteer    ● vsteer    □ hbpm    ■ vbpm

• vert beta func (Y1)    • model beta (Y1)    • vert phase (Y2)    • model phase (Y2)

Horizontal fit tune 0.223981 +/- 0.000060  
The orbit(s) have been loaded.

PS State

Horizontal

Vertical

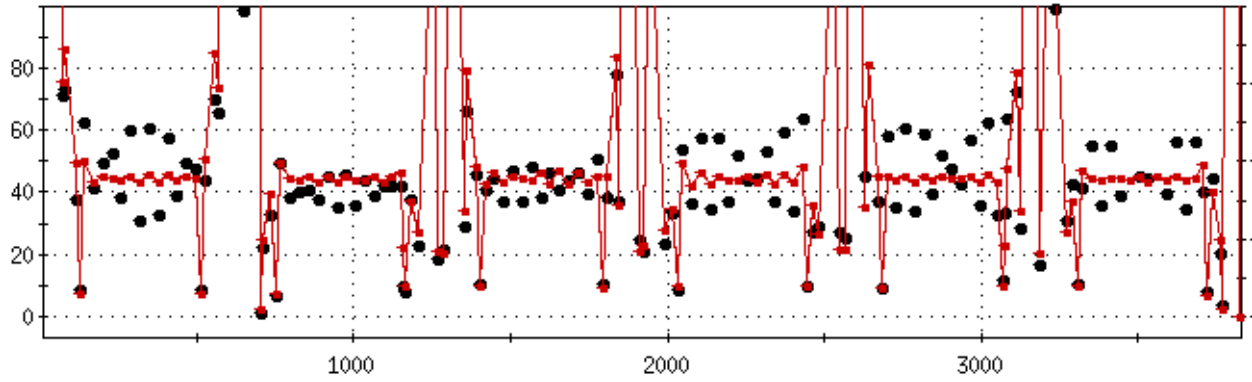
Setup/Betatron Tunes

	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2198	0.0000	40.000	20.000	60.000	0.2302
V:	0.2240	0.0500	40.000	20.000	40.000	0.2148

Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
H_b*sd	0.000	0.000	0.000	0.000	0.000	0.000
H_s*	10.00	10.00	10.00	10.00	10.00	10.00
V_b*	2.92	4.95	0.62	0.68	4.31	3.59
V_b*sd	0.025	0.020	0.048	0.041	0.017	0.025
V_s*	-0.25	1.01	0.47	-0.15	0.48	-0.43



11172 Vacd\_store\_01

File Lattice SetUp Help

Betatron/Phase Advance    Beta Beat

PS State  
 Horizontal Off-Error    On  
 Vertical Off    On

Setup/Betatron Tunes

	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2198	0.0000	40.000	20.000	60.000	0.2302
V:	0.2040	0.0500	40.000	20.000	40.000	0.2148

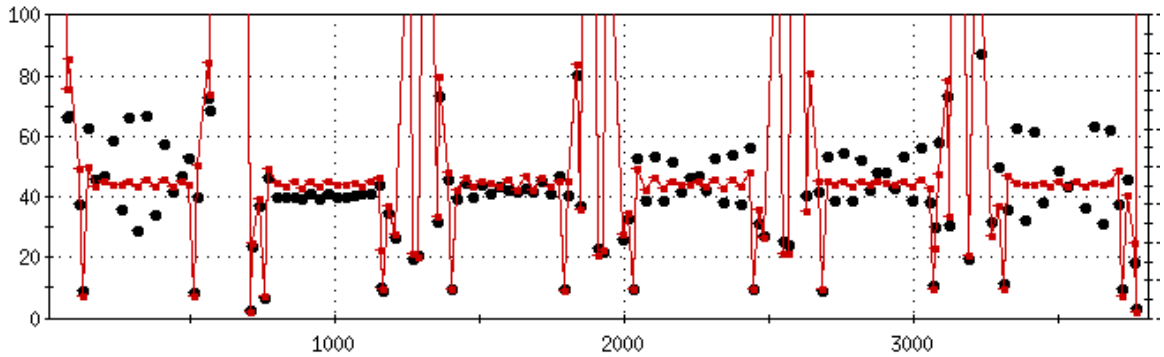
Trigger AC Dipole  
 Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
H_b*sd	0.000	0.000	0.000	0.000	0.000	0.000
H_s*	10.00	10.00	10.00	10.00	10.00	10.00
V_b*	3.13	5.00	0.68	0.64	4.25	3.76
V_b*sd	0.016	0.011	0.028	0.027	0.012	0.013
V_s*	-0.15	-0.42	0.66	-0.17	-0.00	0.12

Beam ==> Lattice: Blue

Horizontal fit tune 0.203287 +/- 0.007625  
 The orbit(s) have been loaded.



11172 Vacd\_store\_02

File Lattice SetUp Help

Betatron/Phase Advance Beta Beat

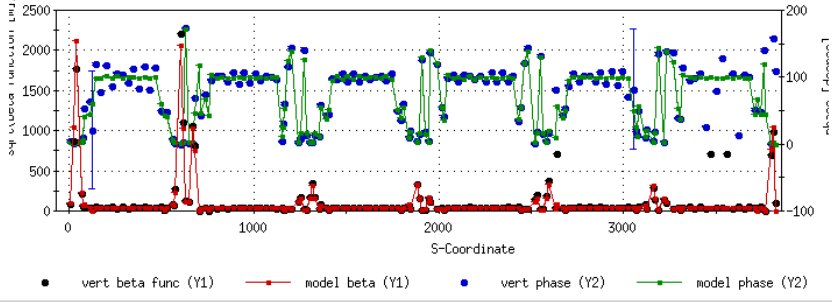


● hori beta func (Y1)    ● model beta (Y1)    ● hori phase (Y2)    ● model phase (Y2)

Beam => Lattice: Blue



— magnets    ○ hsteer    ◻ vsteer    ◻ hbpm    ◻ vbpm



● vert beta func (Y1)    ● model beta (Y1)    ● vert phase (Y2)    ● model phase (Y2)

Vertical fit tune  $0.203999 \pm 0.000015$   
Horizontal fit tune  $0.205238 \pm 0.014333$

PS State

Horizontal Off-Error

Vertical Off

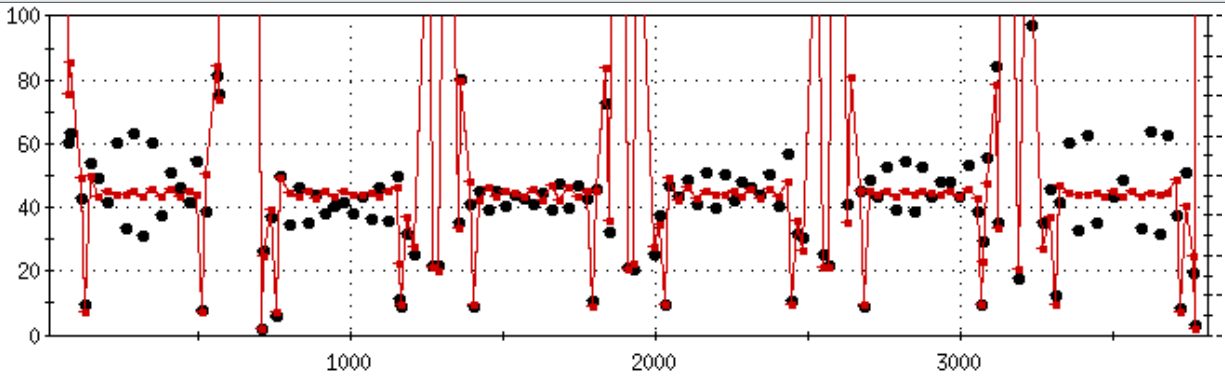
Setup/Betatron Tunes

	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2198	0.0000	40.000	20.000	60.000	0.2302
V:	0.2040	0.0800	40.000	20.000	40.000	0.2148

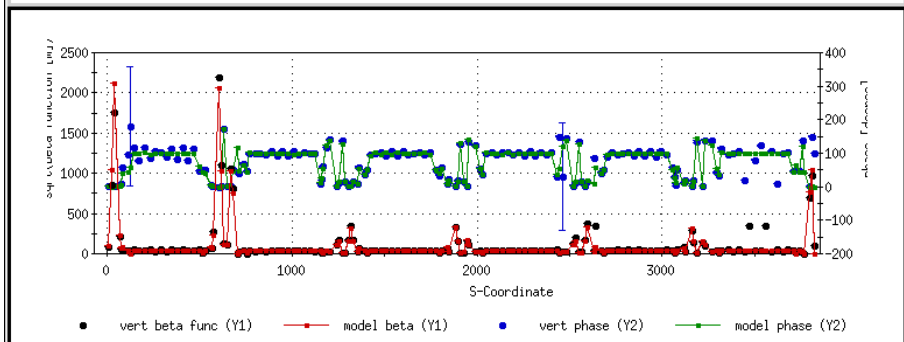
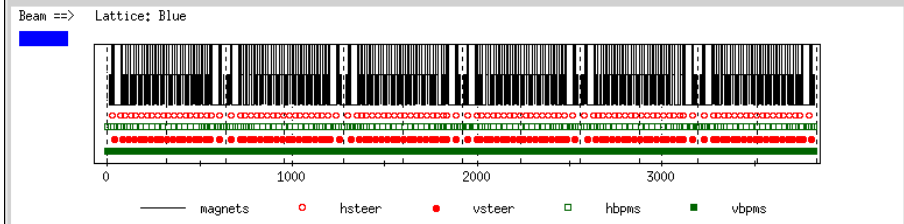
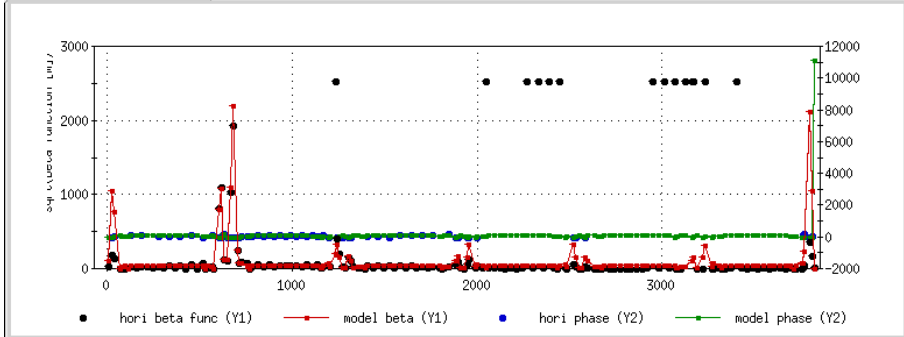
Accumulate Average

Beta\* at IPs

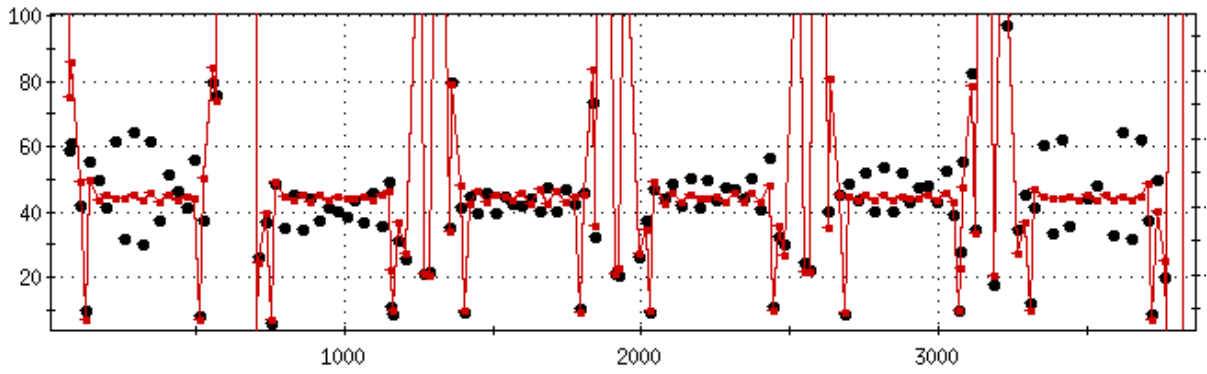
	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
H_b*sd	0.000	0.000	0.000	0.000	0.000	0.000
H_s*	10.00	10.00	10.00	10.00	10.00	10.00
V_b*	3.37	4.57	0.68	0.58	3.72	4.13
V_b*sd	0.017	0.013	0.033	0.034	0.015	0.012
V_s*	-0.50	0.05	-0.80	-0.23	-0.09	-0.16



11172 Vacd\_store\_03



Horizontal fit tune 0.204002 +/- 0.000054  
The orbit(s) have been loaded.



PS State

Horizontal

Vertical

Setup/Betatron Tunes

	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2198	0.0000	40.000	20.000	60.000	0.2302
V:	0.2040	0.1200	40.000	20.000	40.000	0.2148

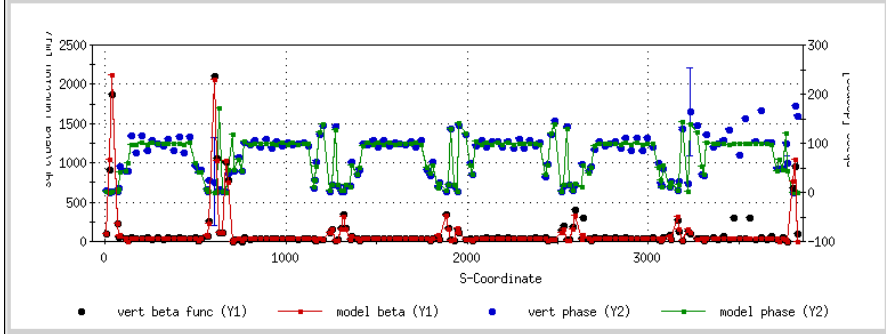
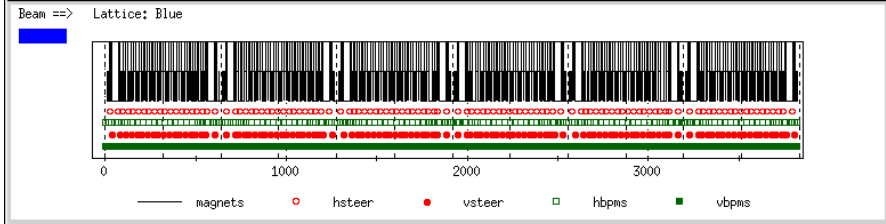
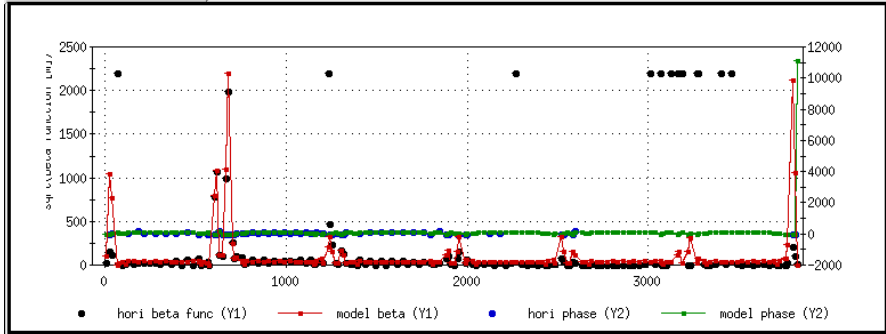
Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	-1.00	-1.00	-1.00	0.58	3.57	-1.00
H_b*sd	0.006	0.003	0.000	0.007	0.007	0.007
H_s*	10.00	10.00	10.00	-0.33	-1.62	10.00
V_b*	3.37	4.50	0.69	0.58	3.77	4.10
V_b*sd	0.014	0.014	0.026	0.032	0.012	0.013
V_s*	-0.55	-0.21	-0.84	-0.23	-0.14	-0.04

11172 Vacd\_store\_04

Betatron/Phase Advance Beta Beat



Horizontal fit tune 0.203994 +/- 0.000040  
The orbit(s) have been loaded.

PS State

Horizontal

Vertical

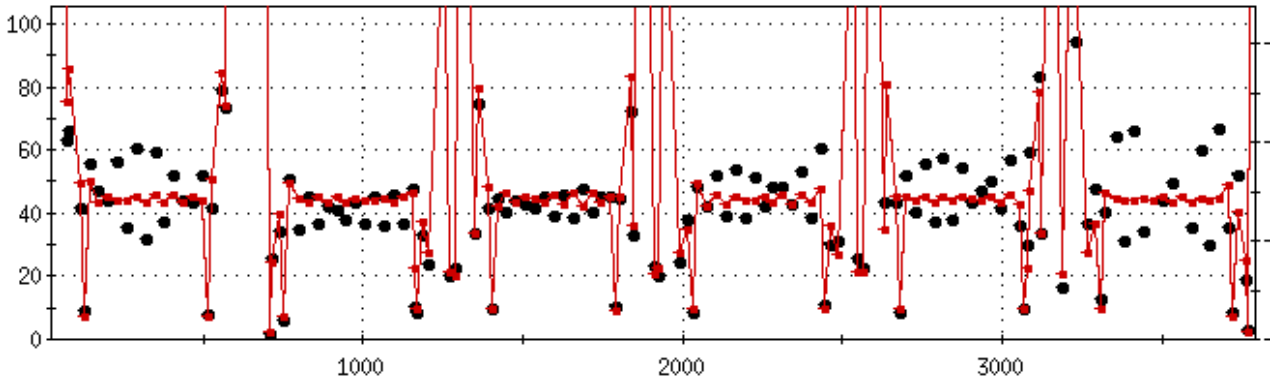
Setup/Betatron Tunes

	Q_d	Amp	Up	F1at	Down	Tune
H:	0.2198	0.0000	40.000	20.000	60.000	0.2302
V:	0.2040	0.1200	40.000	20.000	40.000	0.2148

Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	-1.00	-1.00	-1.00	0.61	3.14	7.74
H_b*sd	0.006	0.000	0.008	0.011	0.008	0.009
H_s*	10.00	10.00	10.00	-0.49	-1.87	-2.29
V_b*	3.17	4.78	0.67	0.60	3.82	3.94
V_b*sd	0.019	0.018	0.044	0.046	0.020	0.019
V_s*	-0.49	0.18	-0.31	-0.21	0.18	-0.33



11172 Vacd\_store\_05

File Lattice Setup Help

Betatron/Phase Advance Beta Beat



● hori beta func (Y1) — model beta (Y1) ● hori phase (Y2) — model phase (Y2)

Beam ==> Lattice: Blue



— magnets ○ hsteer ● vsteer □ hbpm ■ vbpm



● vert beta func (Y1) — model beta (Y1) ● vert phase (Y2) — model phase (Y2)

Horizontal fit tune  $0.225161 \pm 0.013151$   
The orbit(s) have been loaded.

PS State

Horizontal Off-Error

Vertical Off

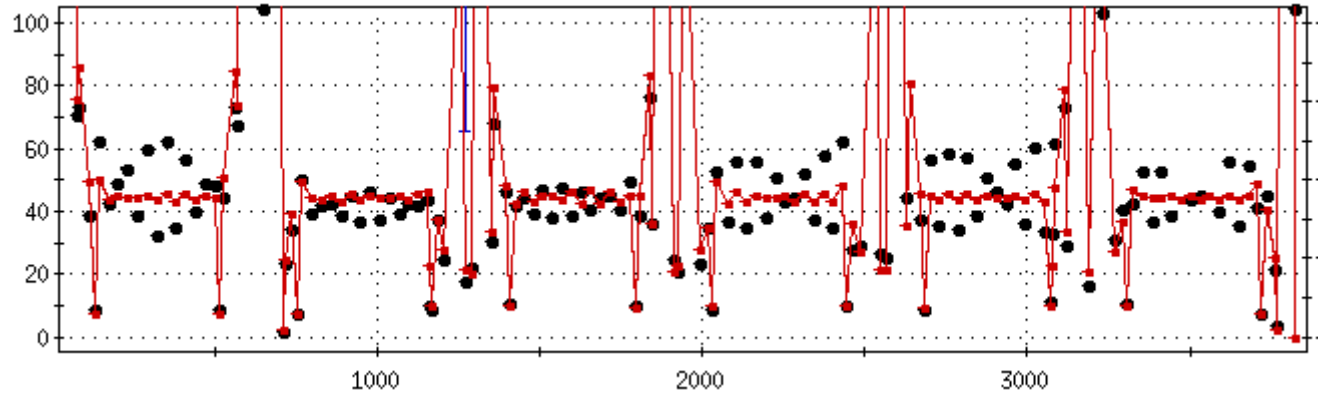
Setup/Betatron Tunes

	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2198	0.0000	40.000	20.000	60.000	0.2302
V:	0.2240	0.0800	40.000	20.000	40.000	0.2148

Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	-1.00	-1.00	-1.00	0.73	3.77	7.10
H_b*sd	0.005	0.000	0.000	0.025	0.012	0.010
H_s*	10.00	10.00	10.00	-0.56	-1.56	-2.14
V_b*	3.01	4.92	0.62	0.66	4.20	3.60
V_b*sd	0.020	0.016	0.042	0.041	0.018	0.020
V_s*	-0.39	1.03	0.23	-0.18	0.21	-0.26



11172 Vacd\_store\_06

File Lattice SetUp Help

Betatron/Phase Advance Beta Beat

● hori beta func (Y1)    ● model beta (Y1)    ● hori phase (Y2)    ● model phase (Y2)

Beam ==> Lattice: Blue

— magnets    ○ hsteer    ● vsteer    □ hbpm    ■ vbpm

● vert beta func (Y1)    ● model beta (Y1)    ● vert phase (Y2)    ● model phase (Y2)

Horizontal fit tune 0.224335 +/- 0.003966  
The orbit(s) have been loaded.

PS State

Horizontal Off-Error

Vertical Off

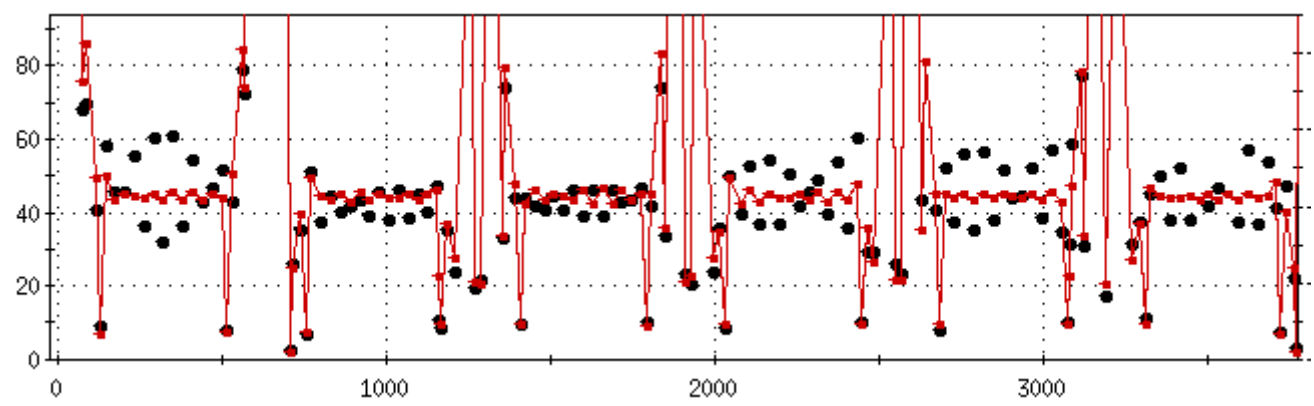
Setup/Betatron Tunes

	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2198	0.0000	40.000	20.000	60.000	0.2302
V:	0.2240	0.0800	40.000	20.000	40.000	0.2148

Accumulate Average

Beta\* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	-1.00	-1.00	-1.00	0.75	3.74	6.69
H_b*sd	0.006	0.000	0.000	0.041	0.020	0.007
H_s*	10.00	10.00	10.00	-0.42	-1.32	-1.67
V_b*	3.14	4.62	0.62	0.61	3.94	3.77
V_b*sd	0.034	0.029	0.064	0.065	0.030	0.029
V_s*	-0.41	1.28	-0.48	-0.19	0.17	-0.28



11172 Vacd\_store\_07