

Blue Horizontal β^* Measurement for Au104 Using Ac Dipole

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Blue Horizontal β^*

(fill 11561)

	IP2	IP4	IP6	IP8	IP10	IP12
Nominal lattice β^*	4.47m	5.35m	0.84m	0.75m	3.56m	4.92m
Modified lattice β^*	4.08m	5.13m	0.79m	0.72m	3.45m	5.12m

	IP2	IP4	IP6	IP8	IP10	IP12
Nominal lattice s^*	-1.2m	-0.21m	0.6m	-0.51m	-0.9m	-1.1m
Modified lattice s^*	-0.88m	-0.65m	-0.04m	-0.68m	-1.16m	-1.38m

- Averages are taken for 6 data sets (3 sets for each side of Qx) and about 5%~10% variations from measurement to measurement are observed for β^* .
- The variations of s^* are large (0.3 meters for non-colliding IP and 1 meter for colliding IP).

Hacd01~06, use q1

Loptics
File Lattice SetUp
Help

Betatron/Phase Advance

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

PS State

Horizontal

Vertical

Beam ==> Lattice: Blue

— magnets ○ hsteer ● vsteer □ hbpm ■ vbpm

Setup/Betatron Tunes

	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2456	0.0800	40.000	20.000	60.000	0.2365
V:	0.2210	0.0000	40.000	20.000	40.000	0.2380

Accumulate Average

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

Beta* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	4.08	5.13	0.79	0.72	3.45	5.12
H_b*sd	0.066	0.159	0.002	0.002	0.022	0.373
H_s*	-0.88	-0.65	-0.04	-0.68	-1.16	-1.38
V_b*	-1.00	-1.00	-1.00	-1.00	1.01	-1.00
V_b*sd	0.000	0.000	0.000	0.000	24.357	0.000
V_s*	10.00	10.00	10.00	10.00	8.15	10.00

Horizontal fit tune 0.226605 +/- 0.000015
The orbit(s) have been loaded.

Hacd07~12, use q1

Loptics
File Lattice SetUp Help

Betatron/Phase Advance
Beta Beat

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

PS State

Horizontal

Vertical

Setup/Betatron Tunes

	Q _d	Amp	Up	Flat	Down	Tune
H:	0.2260	0.0800	40.000	20.000	60.000	0.2360
V:	0.2210	0.0000	40.000	20.000	40.000	0.2236

Accumulate Average

Beta* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H _b *	4.47	5.35	0.84	0.75	3.56	4.92
H _b *sd	0.095	0.050	0.005	0.013	0.235	0.627
H _s *	-1.20	-0.21	0.60	-0.51	-0.90	-1.10
V _b *	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
V _b *sd	0.000	0.000	0.000	0.000	0.000	0.000
V _s *	10.00	10.00	10.00	10.00	10.00	10.00

Beam ==> Lattice: Blue

— magnets ○ hsteer ● vsteer □ hbpm ■ vbpm

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

Horizontal fit tune 0.227326 +/- 0.014955

The orbit(s) have been loaded.

Thank you!

$$s^* = s_0^* - \frac{\beta^*}{2} \left(\frac{\beta}{s_1 - s_2} \right) \frac{\delta\beta}{\beta}$$

$$\beta = \max(\beta_1, \beta_2)$$

For dx bpm in IP8 $\frac{\beta}{s_1 - s_2} \approx 6$

For q1 bpm in IP8 $\frac{\beta}{s_1 - s_2} \approx 20$

Hacd07+13, use q1

File Lattice SetUp
Optics
Help

Betatron/Phase Advance **Beta Beat**

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

PS State

Horizontal Stby On

Vertical Stby On

Setup/Betatron Tunes

	Q _d	Amp	Up	Flat	Down	Tune
H:	0.2260	0.0800	40.000	20.000	60.000	0.2360
V:	0.2210	0.0000	40.000	20.000	40.000	0.2236

Accumulate Average

Beam ==> Lattice: Blue

— magnets ○ hsteer ● vsteer □ hbpm ■ vbpm

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

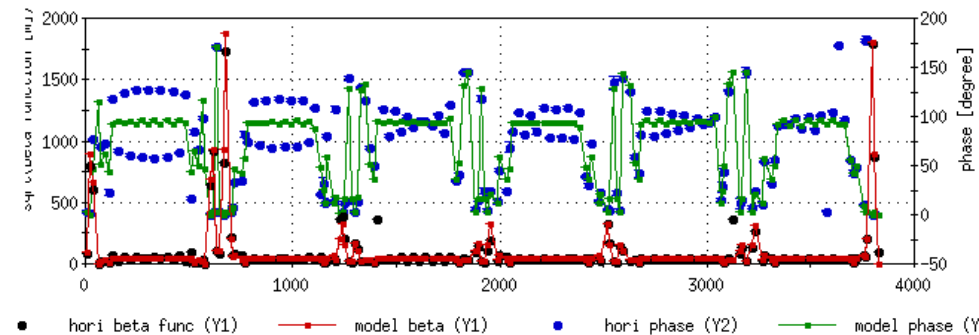
Horizontal fit tune 0.225999 +/- 0.000011

The orbit(s) have been loaded.

Hacd03, use dx

File Lattice SetUp
Help

Betatron/Phase Advance
Beta Beat



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

PS State

Horizontal

Vertical

Setup/Betatron Tunes


	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2456	0.1503	40.000	20.000	60.000	0.2356
V:	0.2210	0.0000	40.000	20.000	40.000	0.2268

Accumulate Average

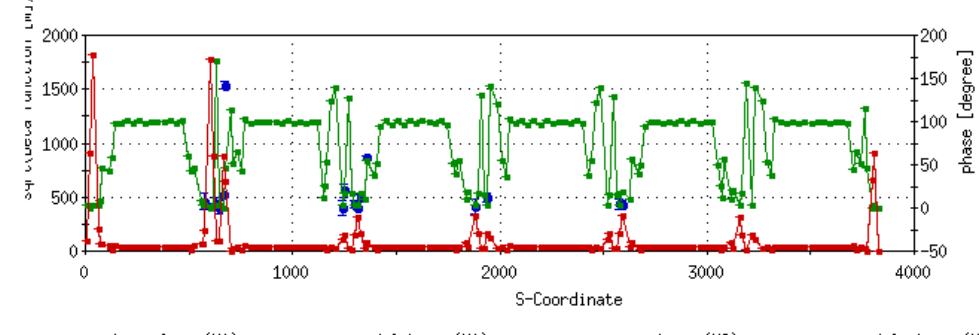
Beta* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	4.02	-1.00	-1.00	0.70	3.61	5.65
H_b*sd	0.012	0.007	0.000	0.015	0.014	0.015
H_s*	-0.97	10.00	10.00	-0.47	-1.21	-1.16
V_b*	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
V_b*sd	0.010	0.008	0.007	0.010	0.012	0.009
V_s*	10.00	10.00	10.00	10.00	10.00	10.00

Beam ==> Lattice: Blue



— magnets ○ hsteer ● vsteer □ hbpm ■ vbpm



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

Horizontal fit tune 0.245600 +/- 0.000014
The orbit(s) have been loaded.

Hacd06, use dx

File Lattice SetUp
Help

Betatron/Phase Advance **Beta Beat**

PS State

Horizontal Stby

Vertical Stby

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

Setup/Betatron Tunes

	Q_d	Amp	Up	Flat	Down	Tune
H:	0.2266	0.1503	40.000	20.000	60.000	0.2356
V:	0.2210	0.0000	40.000	20.000	40.000	0.2268

Accumulate Average

Beam ==> Lattice: Blue

— magnets ○ hsteer ● vsteer □ hbpm ■ vbpm

Beta* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	4.39	-1.00	-1.00	0.68	3.17	5.36
H_b*sd	0.014	0.007	0.000	0.015	0.015	0.015
H_s*	-1.04	10.00	10.00	-0.56	-1.11	-1.76
V_b*	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
V_b*sd	0.012	0.007	0.011	0.000	0.013	0.010
V_s*	10.00	10.00	10.00	10.00	10.00	10.00

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

Horizontal fit tune 0.226605 +/- 0.000015

The orbit(s) have been loaded.