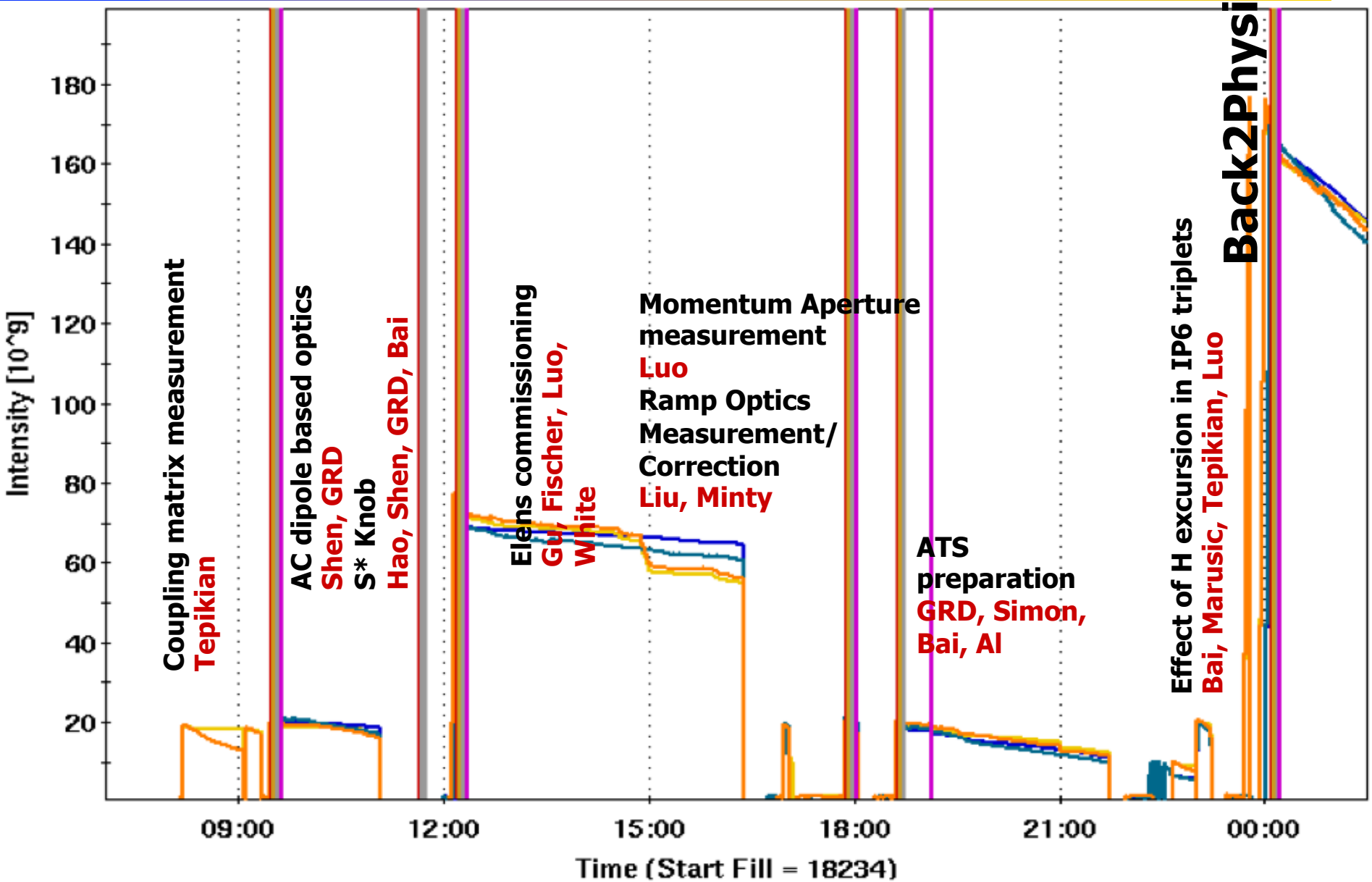
APEX
RUN-14

APEX Schedule April 23, 2014

Injection	Store	Store	Store	Store		
Coupling matrix measurement Tepikian	AC dipole based optics Shen, GRD S* Knob Hao, Shen, GRD, Bai	Elens commissioning Gu, Fischer, Luo, White	Momentum Aperture measurement Luo Ramp Optics Measurement/Correction Liu, Minty	ATS preparation GRD, Simon, Bai, Al	Effect of H excursion in IP6 triplets Bai, Marusic, Tepikian, Luo	Back2Physics
8:00am	9:00am	11:00am	3:00pm	6:00pm	9:00pm	11:00pm 12:00pm

APEX Overview



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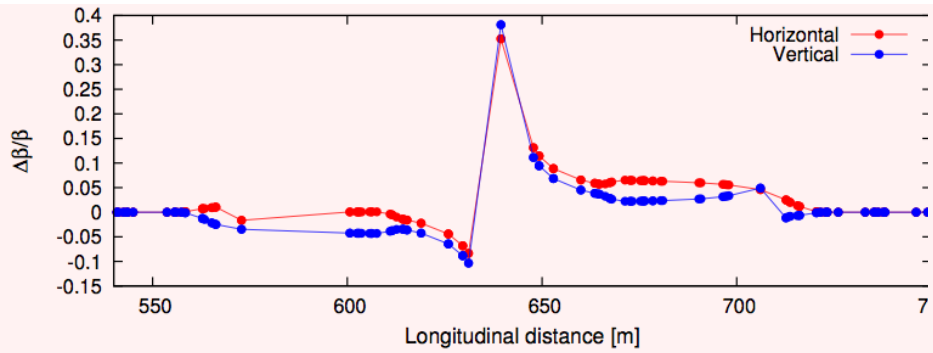
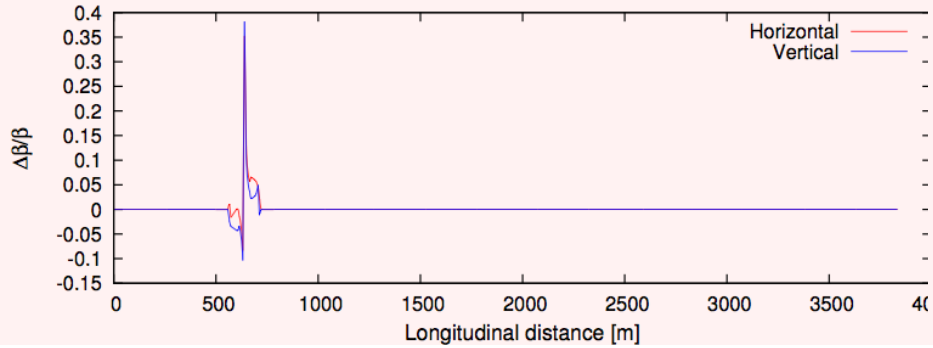
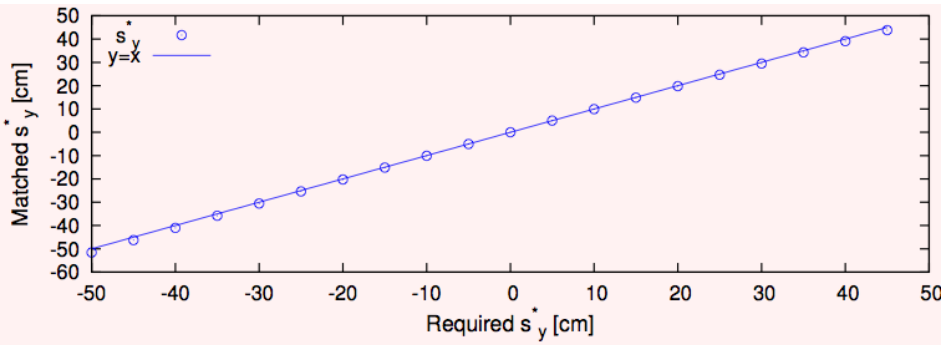
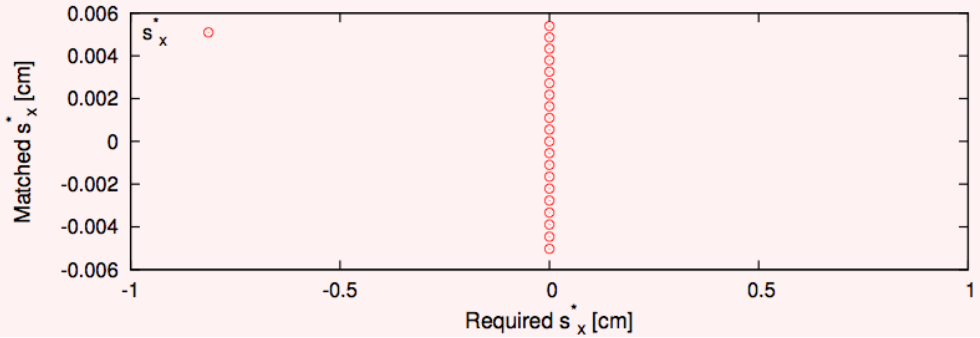
APEX Experiment s* Knob

Shen, Hao, GRD, White, Duan, Bai





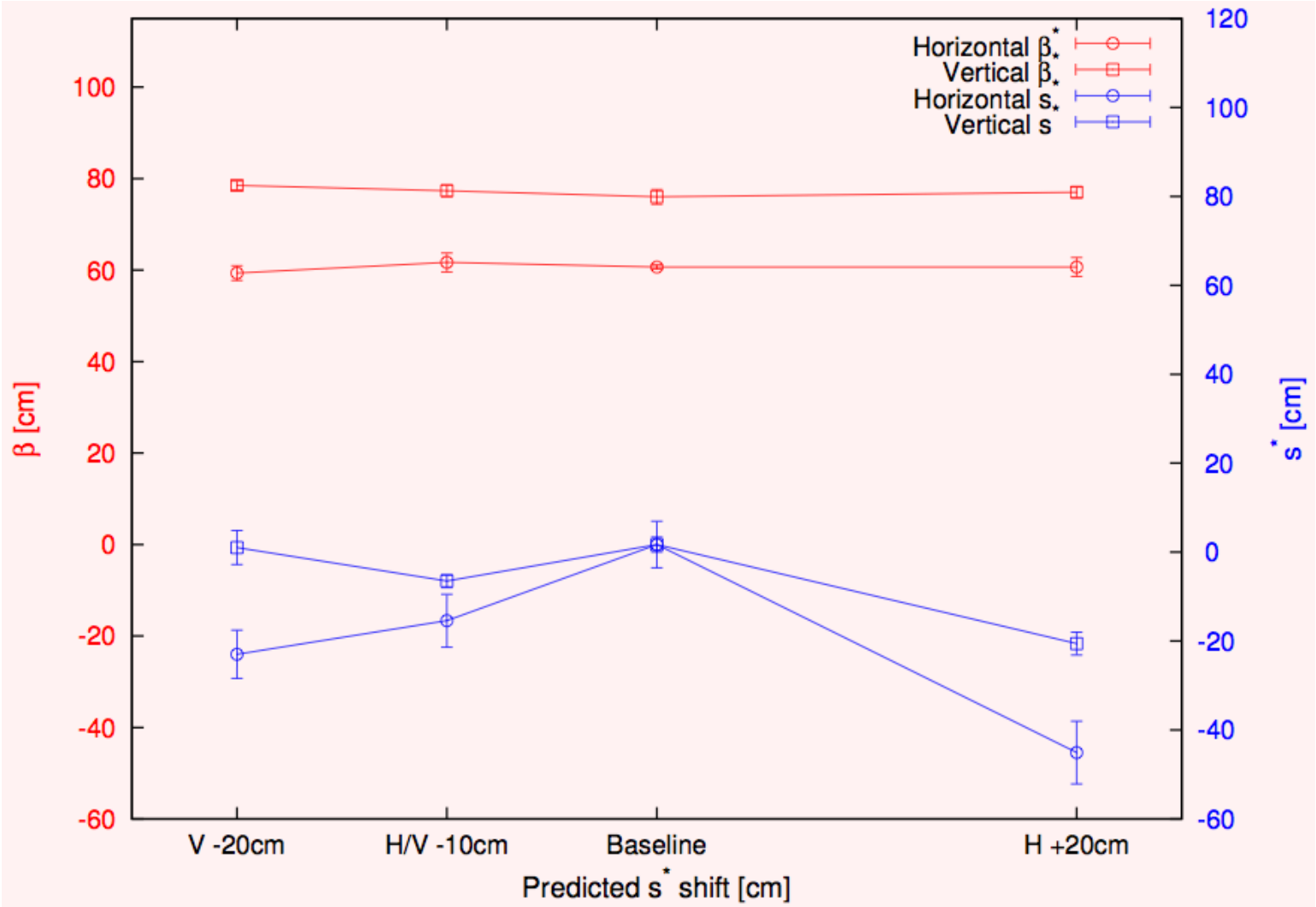




APEX Experiment s* Knob

Shen, Hao, GRD, White, Duan, Bai

s^* and β^*. Error bars reflect standard deviation.



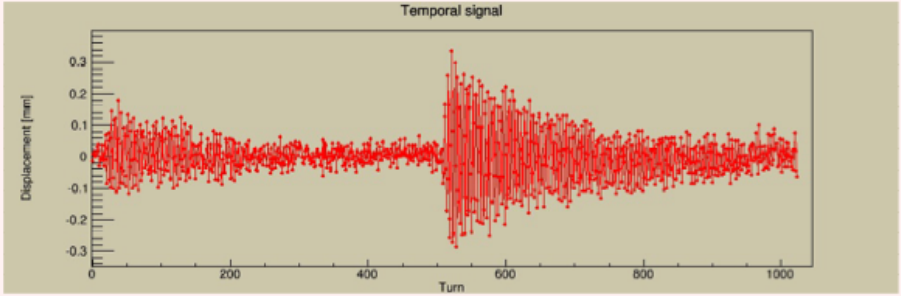
APEX Experiment s* Knob

Shen, Hao, GRD, White, Duan, Bai

Conclusion

Turn-by-turn BPM based s^* measurement

- More sensitive than β^* measurement, strong coupling in the horizontal plane could be an issue



- s^* knob manipulation exhibits linear/nonlinear response range
- Manupilation with $\sim 20\%$ beta-beat, studies are in progress

Further study

- Improve machine condition for "cleaner" s^* manipulation and measurement
- Explore other methods

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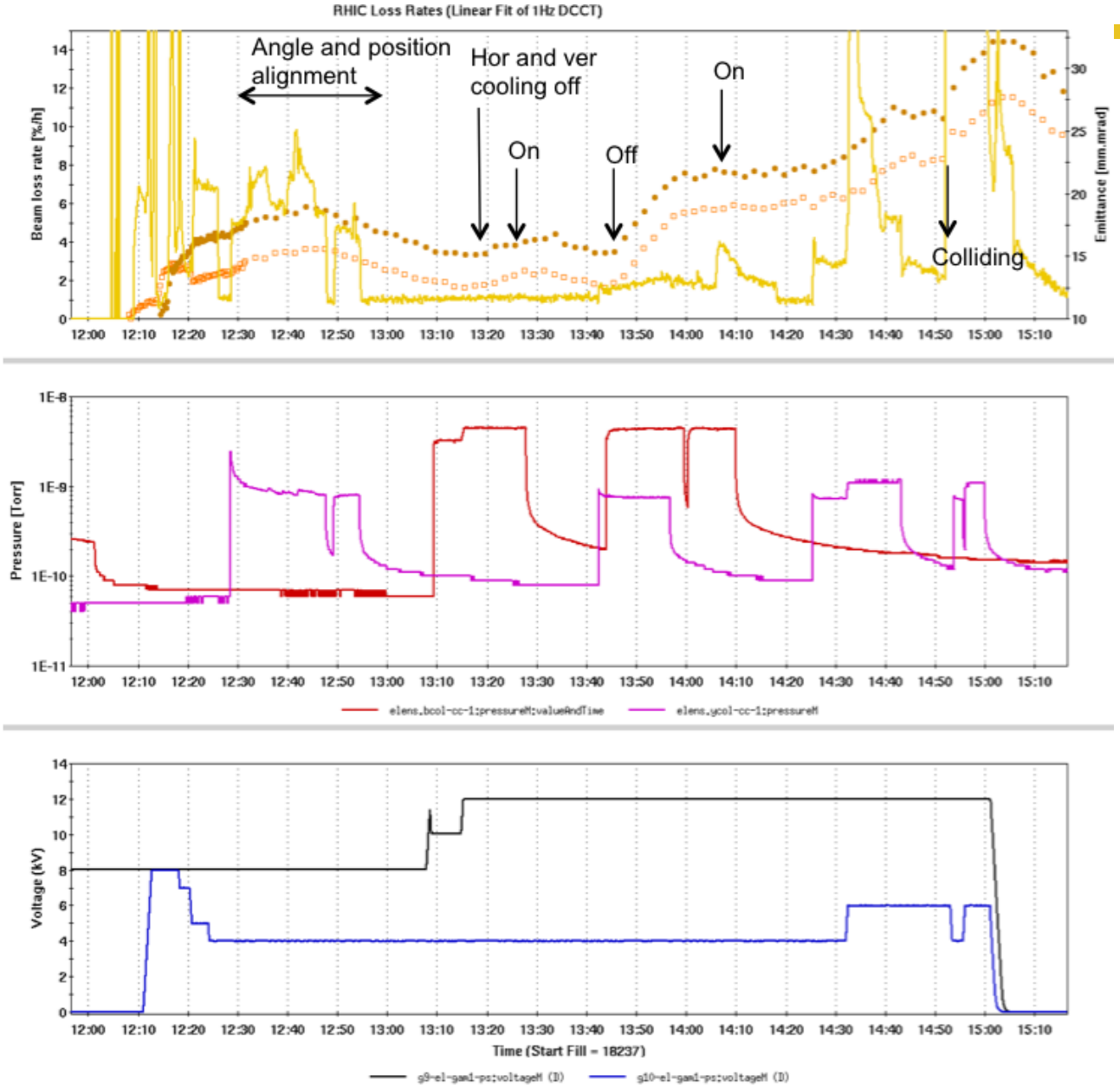
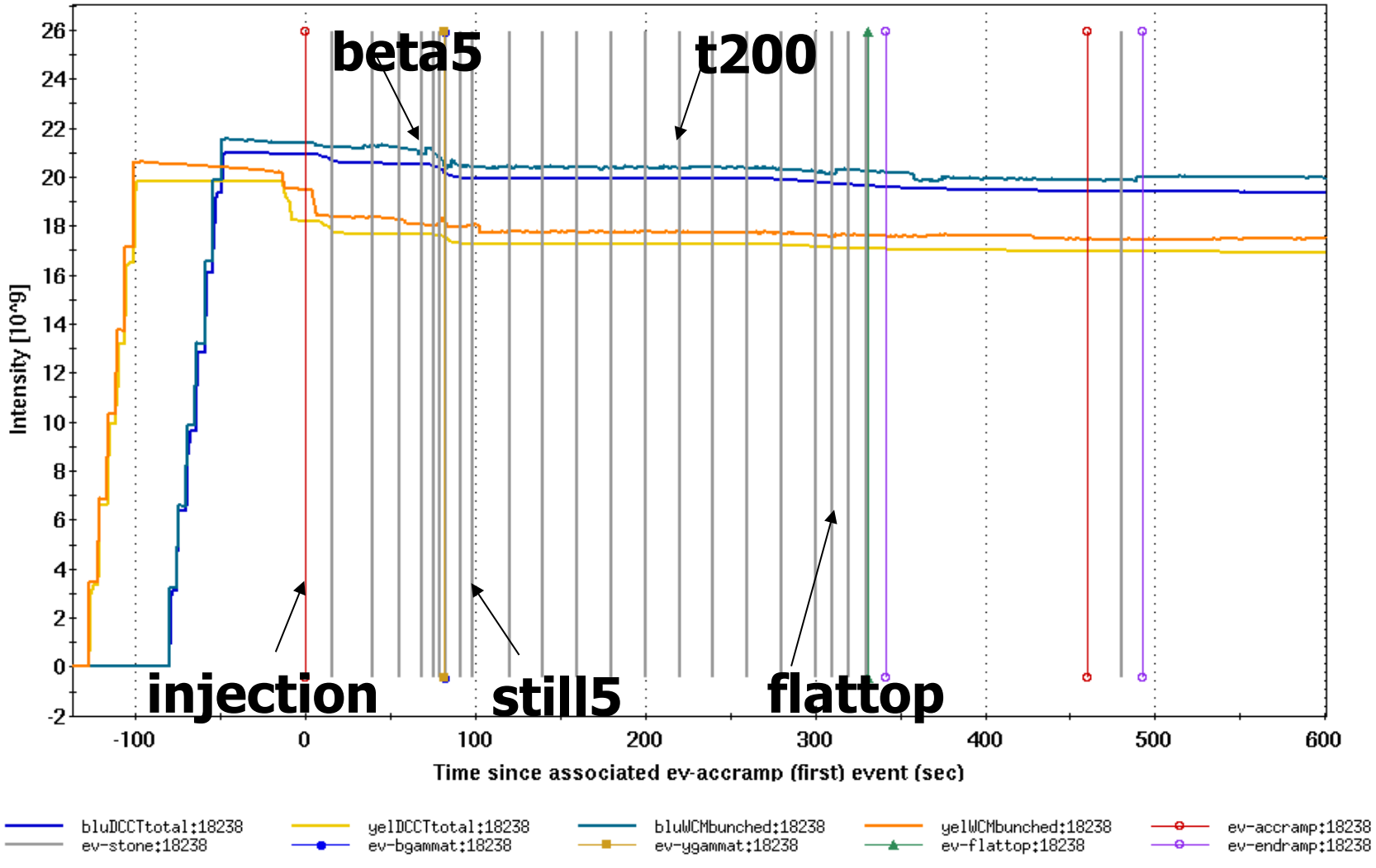
Elens: Gu, Fischer, White, Luo, etc



Ramp Optics Correction: Liu, Minty, Marusic

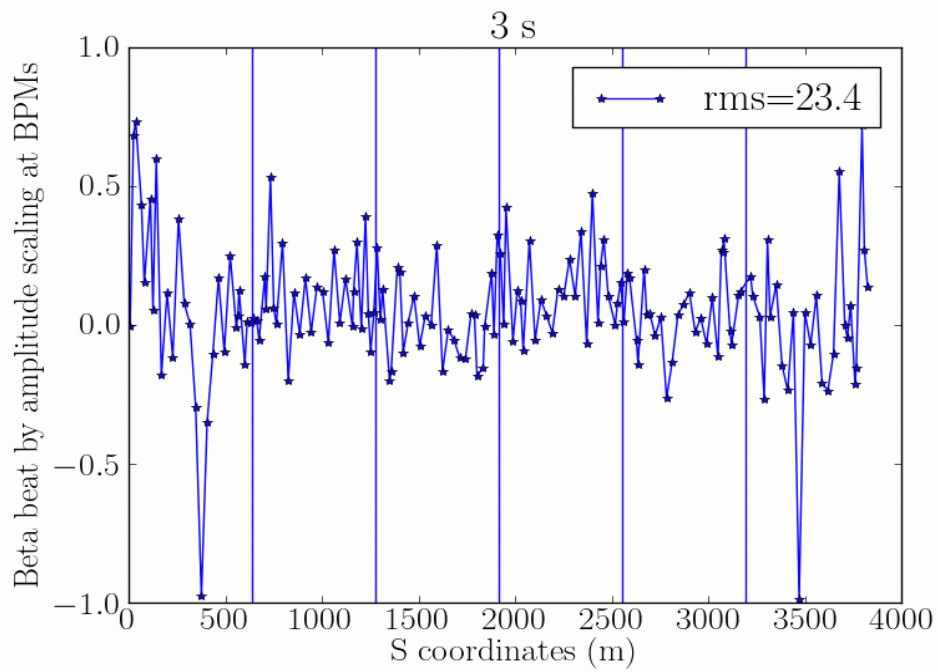
Stones with corrections



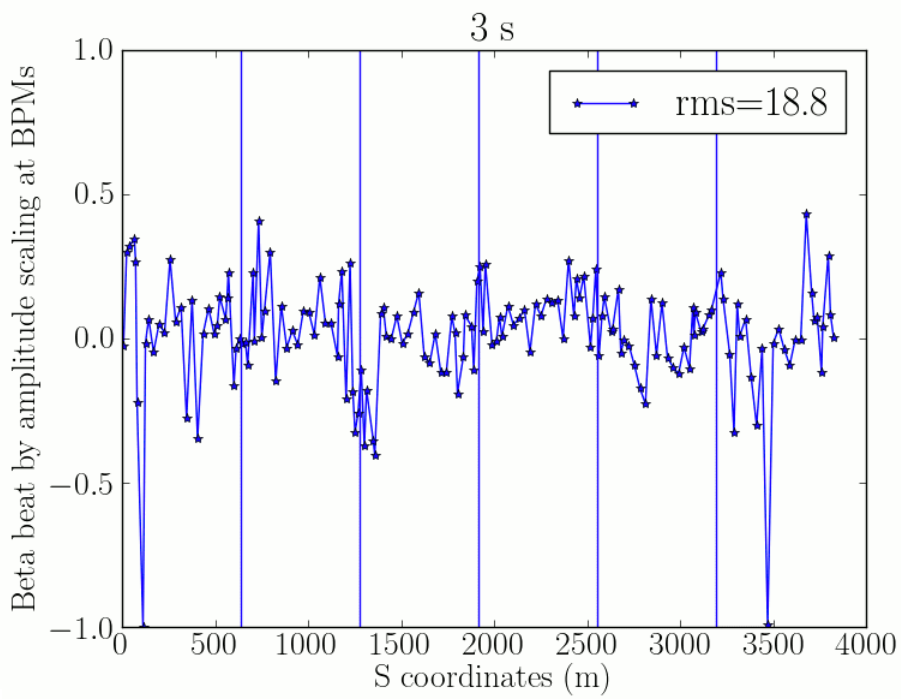
Ramp Optics Correction: Liu, Minty, Marusic

Beta beat on the ramp

Yellow horizontal, fill 18179
no correction



Yellow horizontal, fill 18238
with correction



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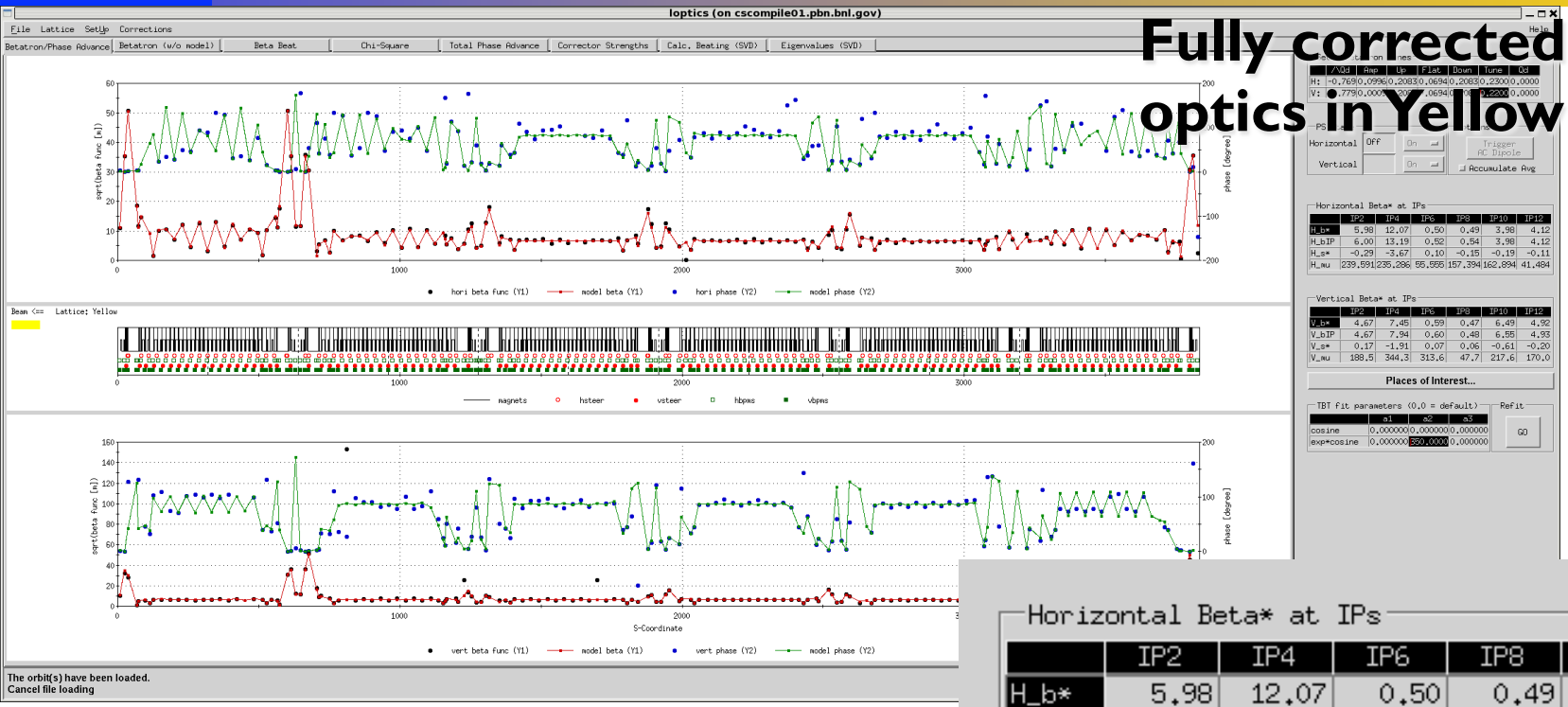
ATS Preparation: GRD, Marusic, Shen, White, Luo, Bai

Fully corrected 50cm optics in Yellow



Optics Table | Stepstone Editor | Compare/Revert

Blue | Yellow

	Time	Stepstone	Gamma	TuneX	TuneY	ChromX	ChromY
1	0.0	flattop	107.396	28.2392	29.2279	2.4	8.0
2	20.0	beta60	107.396	28.2126	29.2587	-8.6	10.0
3	40.0	beta50	107.396	28.2076	29.2582	-18.3	-0.7
4	60.0	store	107.396	28.2133	29.2499	-14.0	13.0

Horizontal Beta* at IPs

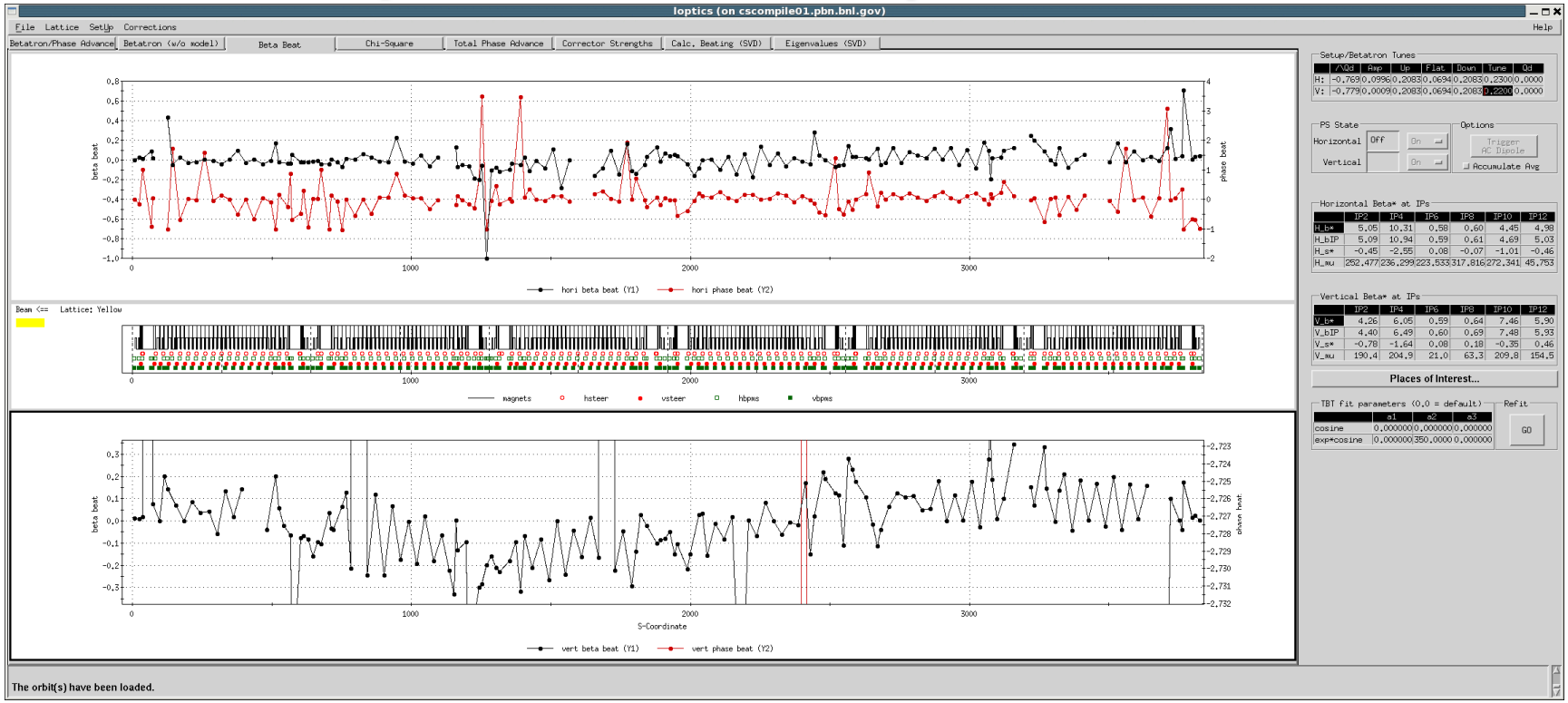
	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	5.98	12.07	0.50	0.49	3.98	4.12
H_bIP	6.00	13.19	0.52	0.54	3.98	4.12
H_s*	-0.29	-3.67	0.10	-0.15	-0.19	-0.11
H_mu	239.591	235.286	55.555	157.394	162.894	41.484

Vertical Beta* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
V_b*	4.67	7.45	0.59	0.47	6.49	4.92
V_bIP	4.67	7.94	0.60	0.48	6.55	4.93
V_s*	0.17	-1.91	0.07	0.06	-0.61	-0.20
V_mu	188.5	344.3	313.6	47.7	217.6	170.0

ATS Preparation: GRD, Marusic, Shen, White, Luo, Bai

Fully corrected 60cm optics in Yellow



Horizontal Beta* at IPs

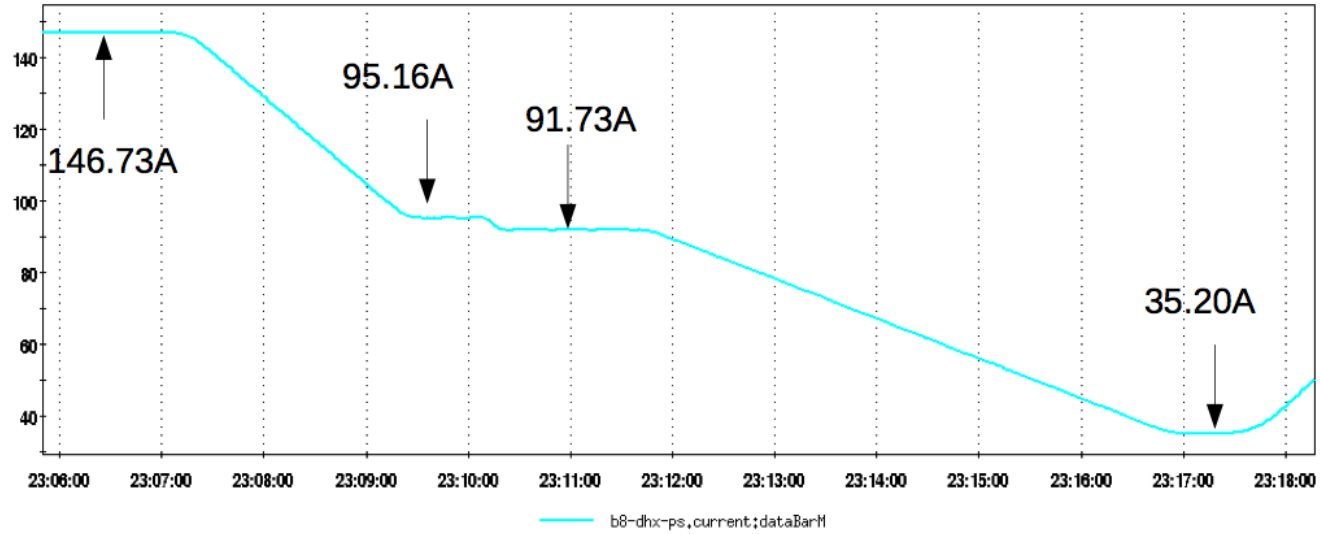
	IP2	IP4	IP6	IP8	IP10	IP12
H_b*	5.05	10.31	0.58	0.60	4.45	4.98
H_bIP	5.09	10.94	0.59	0.61	4.69	5.03
H_s*	-0.45	-2.55	0.08	-0.07	-1.01	-0.46
H_mu	252.477	236.299	223.533	317.816	272.341	45.753

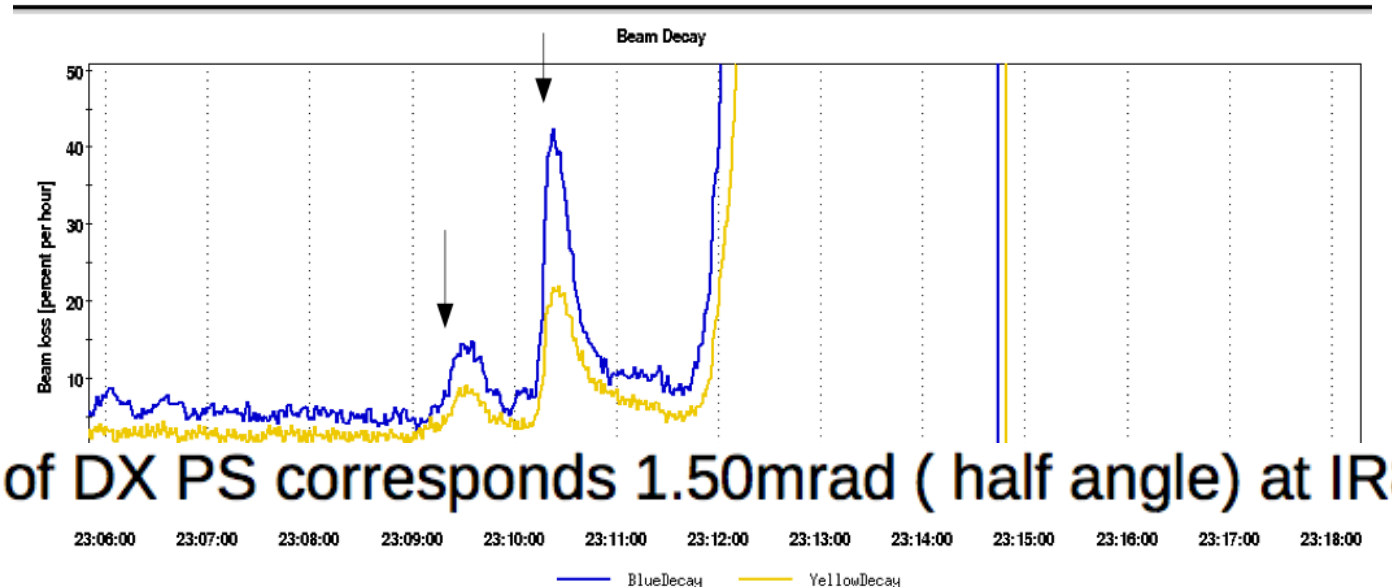
Vertical Beta* at IPs

	IP2	IP4	IP6	IP8	IP10	IP12
V_b*	4.26	6.05	0.59	0.64	7.46	5.90
V_bIP	4.40	6.49	0.60	0.69	7.48	5.93
V_s*	-0.78	-1.64	0.08	0.18	-0.35	0.46
V_mu	190.4	204.9	21.0	63.3	209.8	154.5

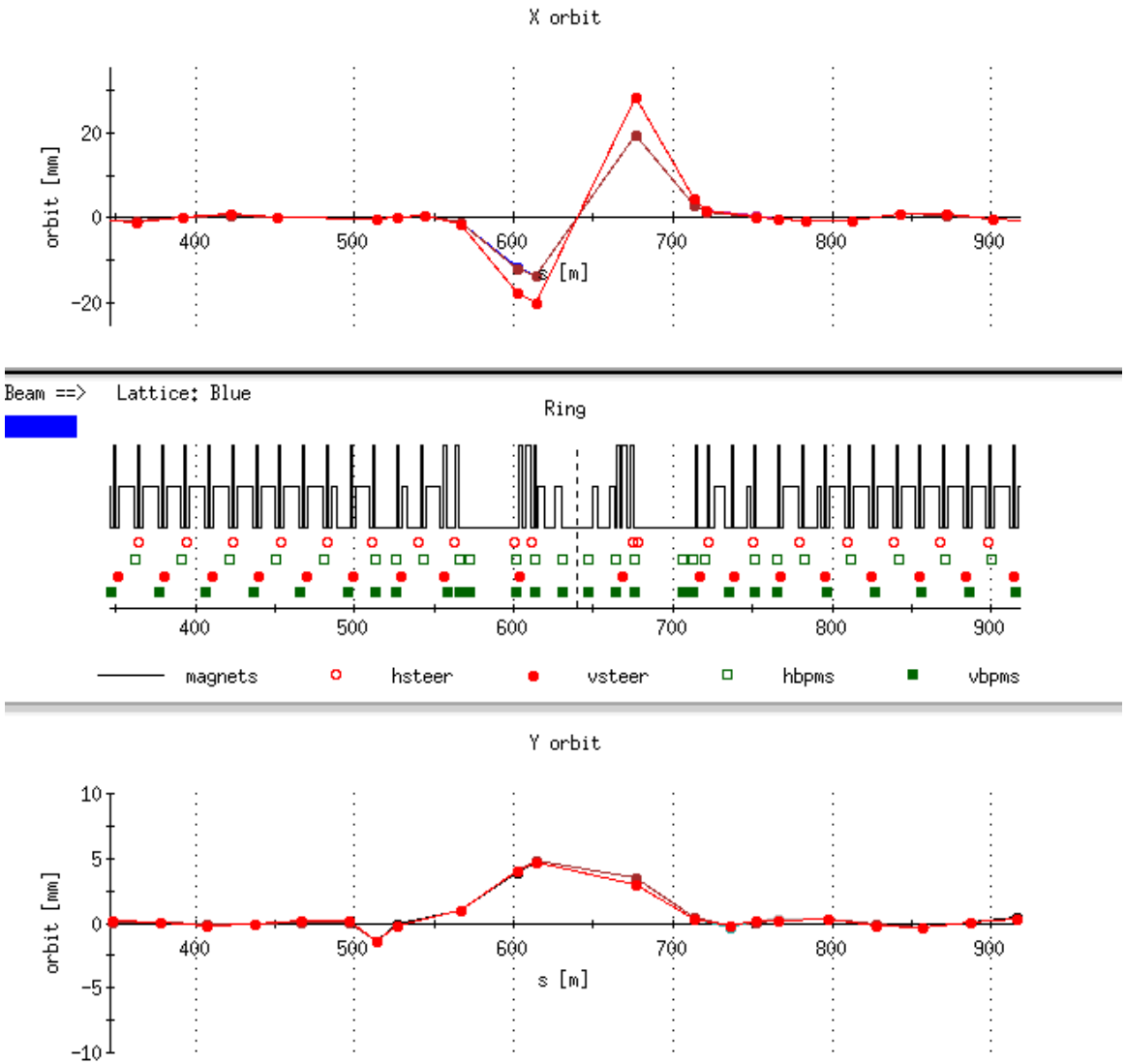
Triplet H offset Effect: Tepikian, Marusic, Luo, Bai

Repeated DX-D0 Angle Scan at IP8 without collimator w. 12 bunches





95A of DX PS corresponds 1.50mrad (half angle) at IR8

Triplet H offset Effect: Tepikian, Marusic, Luo, Bai

- At injection used H angle bump at IP8 to explore the available aperturein the triplets
- Confirmed both beams were good with offcenter at 15mm, which is needed for He3Au at the end of this run
- Will continue the study at store with squeezed beta* lattice