

Off-momentum beta-beat corr.

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- **April 4, 2012 Session**

- Allocated 2 hours
- Actually used 1 hour 20 minutes
- 1 hour used from the schedule

1 hour: injection 30 minutes (?)

ramp 10 minutes

20 minutes setup, (yellow beta* meas.,

dumped beams during Q" meas.)

- 20 minutes from Simon's left-over at Mei's mercy

just enough to measure off-momentum beta*s at Blue IP8

Beta_star measurement on March 21, 2012

(2012 p-p 250 GeV run)

From Q1 knobbing (Yun):

	[units in meter]								
	betax*	alfax*	betax_waist	waistlocation	<u>betay*</u>	<u>alfay*</u>	<u>betay_waist</u>	<u>waistlocation</u>	
Blue IP6:	0.885	-0.1395	0.868	0.12	2.15	-1.39	0.73	1.01	
Blue IP6:	0.807	0.0110	0.807	0.009	2.77	-1.67	0.73	1.22	
Blue IP6:	0.819	-0.151	0.801	0.121	2.70	-1.57	0.78	1.22	
Blue IP8:	0.621	-0.313	0.566	0.177	3.17	-1.73	0.797	1.377	
Blue IP8:	0.682	0.423	0.578	0.245	2.74	-1.51	0.834	1.261	
Blue IP8:	0.565	0.020	0.564	0.011	2.62	-1.43	0.861	1.232	

(After BBQ setup, each measurement 75 seconds.)

From AC dipole (Mei):

	beta*x_waist	beta*y_waist
Blue IP6:	0.78	0.75
Blue IP8:	0.53	0.71

Beta_star measurement on April 04, 2012

(2012 p-p 250 GeV run)

From Q1 knobbing (Yun):

[units in meter] [beta waist on whihc side not clarified here]

	betax*	alfax*	betax_waist	waist_location	betay*	alfay*	betay_waist	waist_location
Yellow IP6 :	0.70	0.069	0.69	0.05	2.74	-1.78	0.66	1.17
Yellow IP6 :	0.70	0.11	0.69	0.08	2.35	-1.58	0.67	1.06
Yellow IP8 :	0.69	0.08	0.68	0.06	4.50	-2.56	0.60	1.52
Yellow IP8 :	0.70	0.11	0.69	0.07	4.55	-2.50	0.63	1.57
Blue IP6 :	0.79	-0.00	0.79	0.00	2.22	-1.28	0.84	1.07
Blue IP8 :	0.58	0.01	0.58	0.01	3.06	-1.59	0.87	1.38

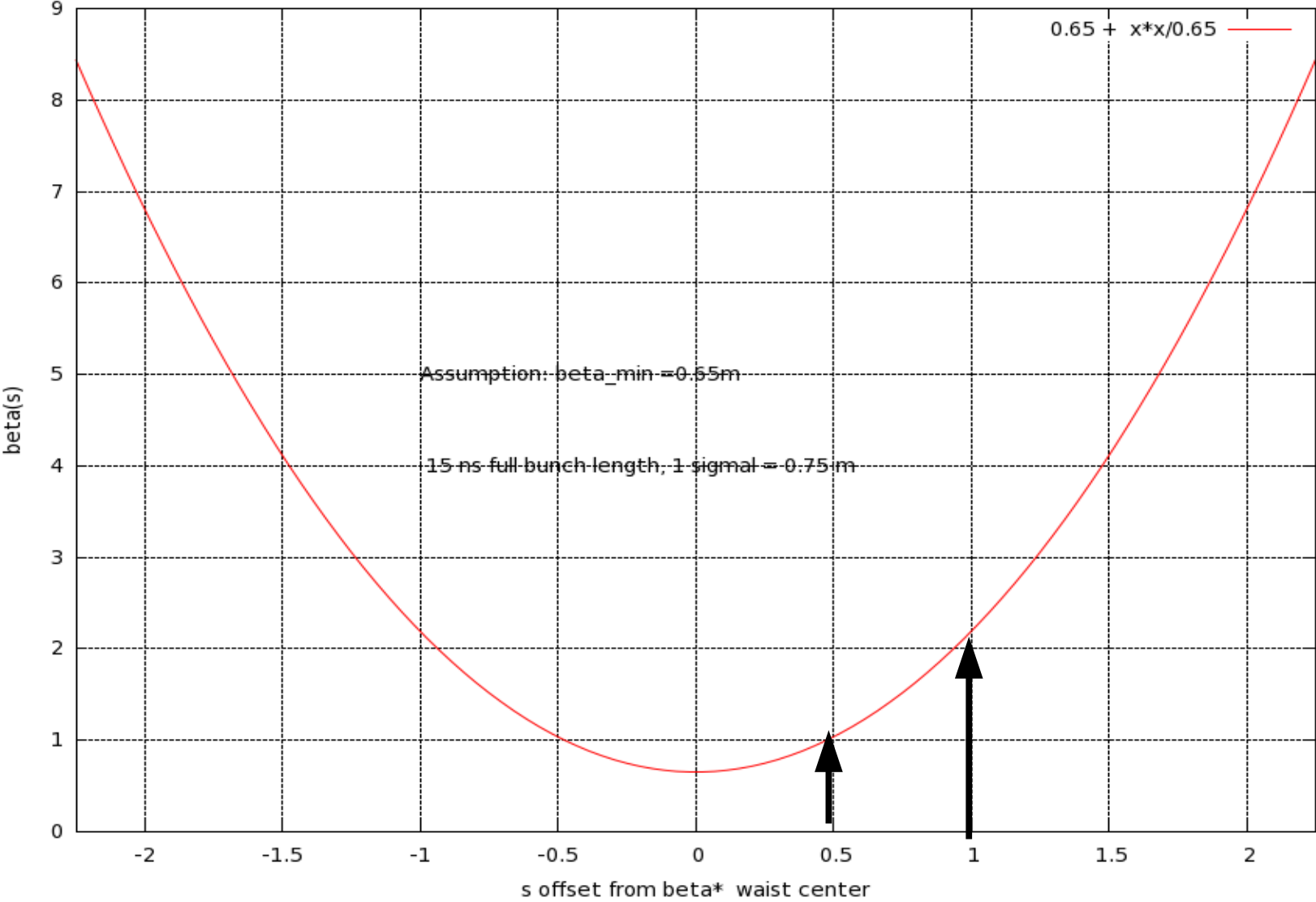
(Note: alfa >0, waist on QD side; alfa <0, waist on QF side)

From AC dipole (Mei):

beta*x waist beta*y waist

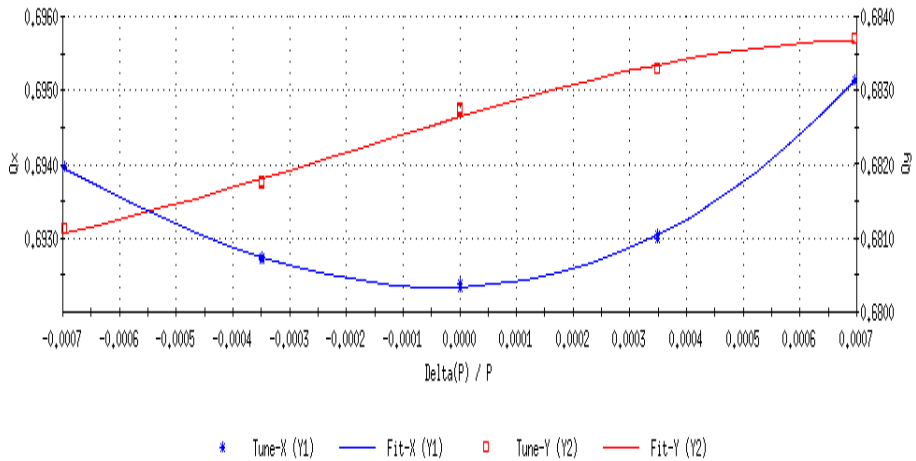
Yellow IP6:	0.73	0.68
Yellow IP8:	0.61	0.61

Beta as function of offset from waist

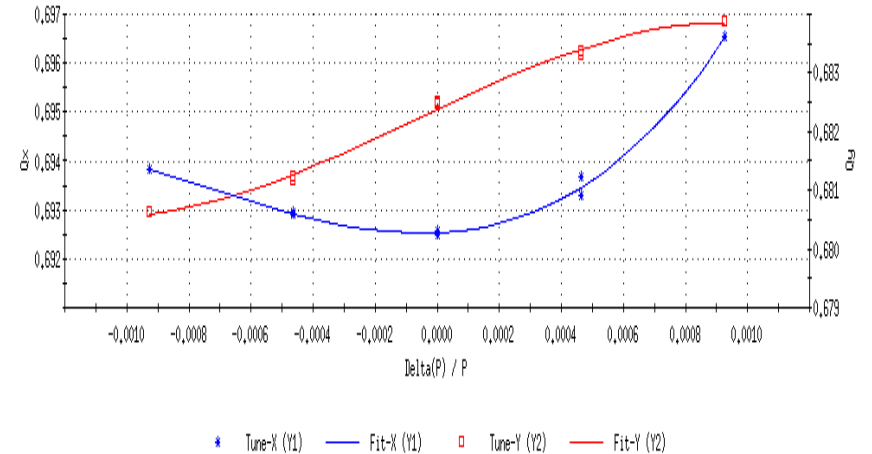


Off-momentum beta-beat correction with arc sextupoles

Fit order = 3



Fit order = 3



Row	Delta(p)/p	Skew q1	BBQ X	Tune X #1	Tune X #2	Select	Skew q2	BBQ Y	Tune Y #1	Tune Y #2	Select
1	-0.000695989	-0.00555119	0.693952	-999	-999	BBQ	0.00818748	0.68111	-999	-999	BBQ
2	-0.000347995	-0.00308209	0.692721	-999	-999	BBQ	0.00475456	0.681742	-999	-999	BBQ
3	-0.000347995	-0.00310549	0.692745	-999	-999	BBQ	0.0048252	0.681756	-999	-999	BBQ
4	0	-0.00145342	0.692387	-999	-999	BBQ	0.000636851	0.682742	-999	-999	BBQ
5	0	-0.00148673	0.69233	-999	-999	BBQ	0.000640257	0.68272	-999	-999	BBQ
6	0.000347995	-0.00209591	0.693006	-999	-999	BBQ	-0.00334767	0.683281	-999	-999	BBQ
7	0.000347995	-0.00199177	0.693049	-999	-999	BBQ	-0.00339857	0.683296	-999	-999	BBQ
8	0.000695989	0.00087867	0.695144	-999	-999	BBQ	-0.00803169	0.683704	-999	-999	BBQ
0	0	0	0	0	0	BBQ	0	0	0	0	BBQ
0	0	0	0	0	0	BBQ	0	0	0	0	BBQ
0	0	0	0	0	0	BBQ	0	0	0	0	BBQ

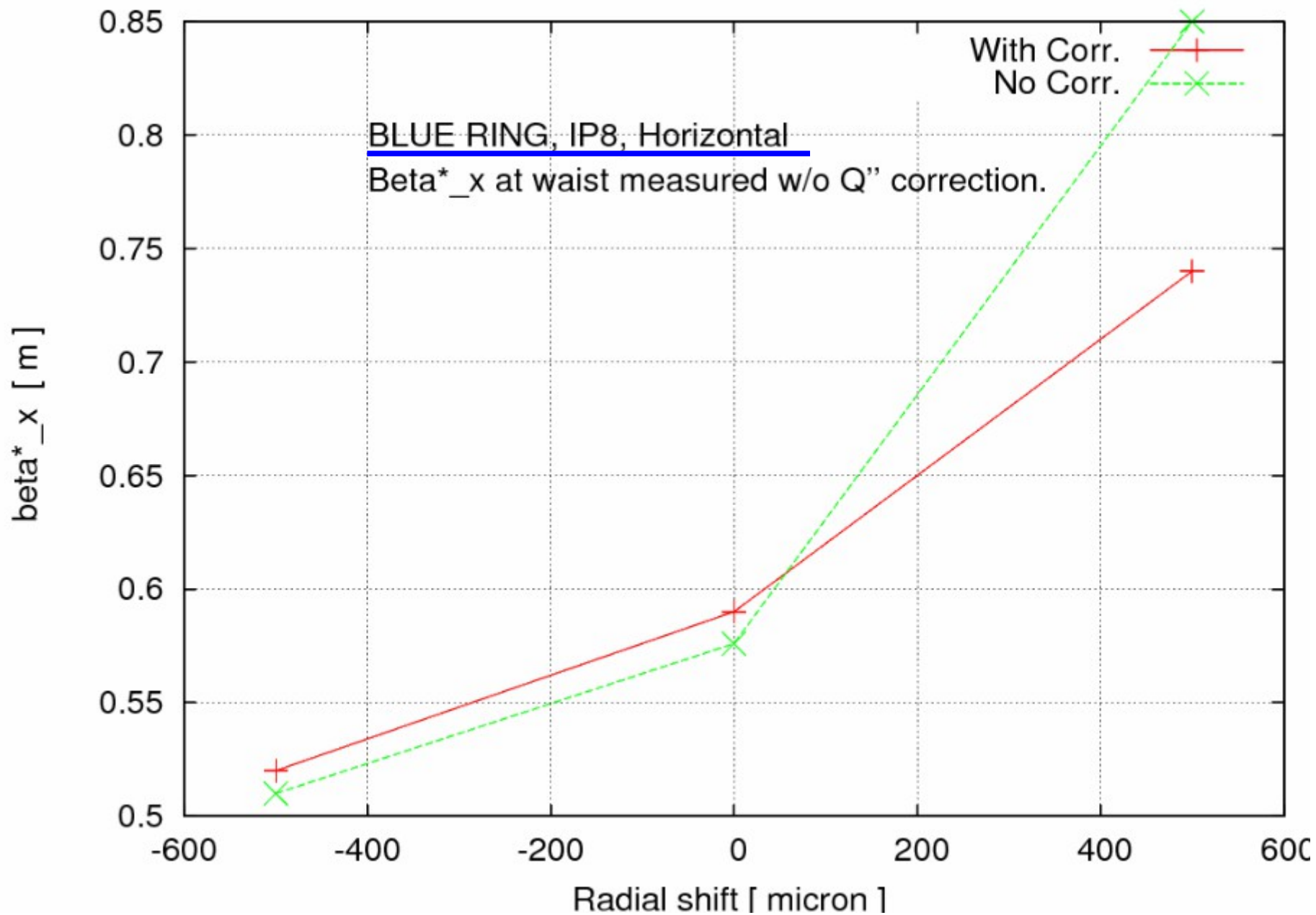
Row	Delta(p)/p	Skew q1	BBQ X	Tune X #1	Tune X #2	Select	Skew q2	BBQ Y	Tune Y #1	Tune Y #2	Select
1	-0.000927986	-0.00745799	0.693835	-999	-999	BBQ	0.00835415	0.680638	-999	-999	BBQ
2	-0.000463993	-0.00407863	0.692921	-999	-999	BBQ	0.00569466	0.68118	-999	-999	BBQ
3	-0.000463993	-0.00419255	0.69294	-999	-999	BBQ	0.00558726	0.681219	-999	-999	BBQ
4	0	-0.00179464	0.692485	-999	-999	BBQ	0.000772386	0.68247	-999	-999	BBQ
5	0	-0.00165032	0.692552	-999	-999	BBQ	0.000697859	0.682513	-999	-999	BBQ
6	0.000463993	-0.00262914	0.69328	-999	-999	BBQ	-0.00439814	0.683367	-999	-999	BBQ
7	0.000463993	-0.0014783	0.693658	0.6875	0.681641	BBQ	-0.00517855	0.683299	0.6875	0.71582	BBQ
8	0.000927986	0.000456768	0.696522	-999	-999	BBQ	-0.0106659	0.683877	-999	-999	BBQ
0	0	0	0	0	0	BBQ	0	0	0	0	BBQ
0	0	0	0	0	0	BBQ	0	0	0	0	BBQ
0	0	0	0	0	0	BBQ	0	0	0	0	BBQ

	Corr	Tune	+Sigma	Chrom[1]	+Sigma	Chrom[2]	+Sigma	Chrom[3]	+Sigma
Horizontal	0.999683	0.692341	1.11194e-05	0.28	0.03	4543	61	1.19214e+06	152336
Vertical	0.99735	0.682643	3.10958e-05	2.33	0.07	-548	171	-957901	426013
Skew-q1	0.96387	-0.00205821	0.000208404	0.47	0.49	-979	1147	8.5622e+06	2.85514e+06
Skew-q2	0.999793	0.000778547	5.06792e-05	-11.75	0.12	-1350	279	211253	694307

	Corr	Tune	+Sigma	Chrom[1]	+Sigma	Chrom[2]	+Sigma	Chrom[3]	+Sigma
Horizontal	0.996873	0.692529	4.81723e-05	0.29	0.08	3080	149	1.34407e+06	278422
Vertical	0.997282	0.682381	4.09381e-05	2.48	0.07	-186	127	-858546	236610
Skew-q1	0.97197	-0.00234091	0.000262733	1.57	0.46	-1586	814	3.12921e+06	1.51852e+06
Skew-q2	0.999387	0.000844412	0.00010619	-11.57	0.19	-2280	329	1.5338e+06	613747

With SFPI/SFMI:-0.09m⁻² correction, Qx" reduced to 3000 from original 4500.

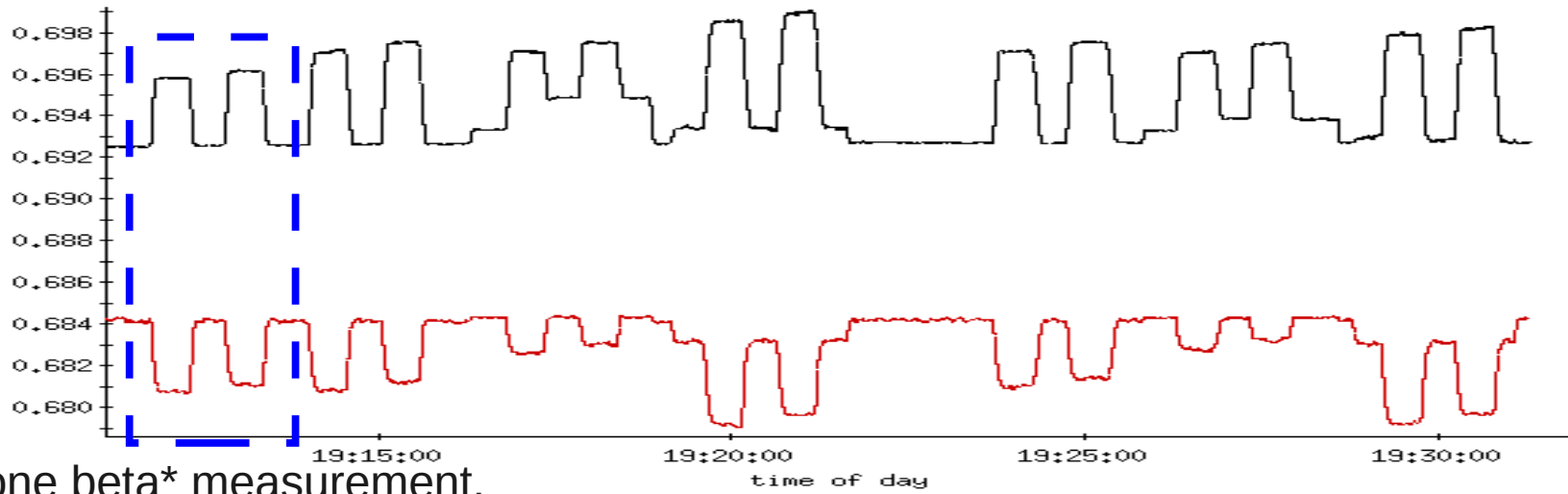
Off-momentum measurement w/o correction



500 microns radial shift corresponds to about $5e-4$ dp/p_0 change.

Raw data during off-momentum beta* measurement

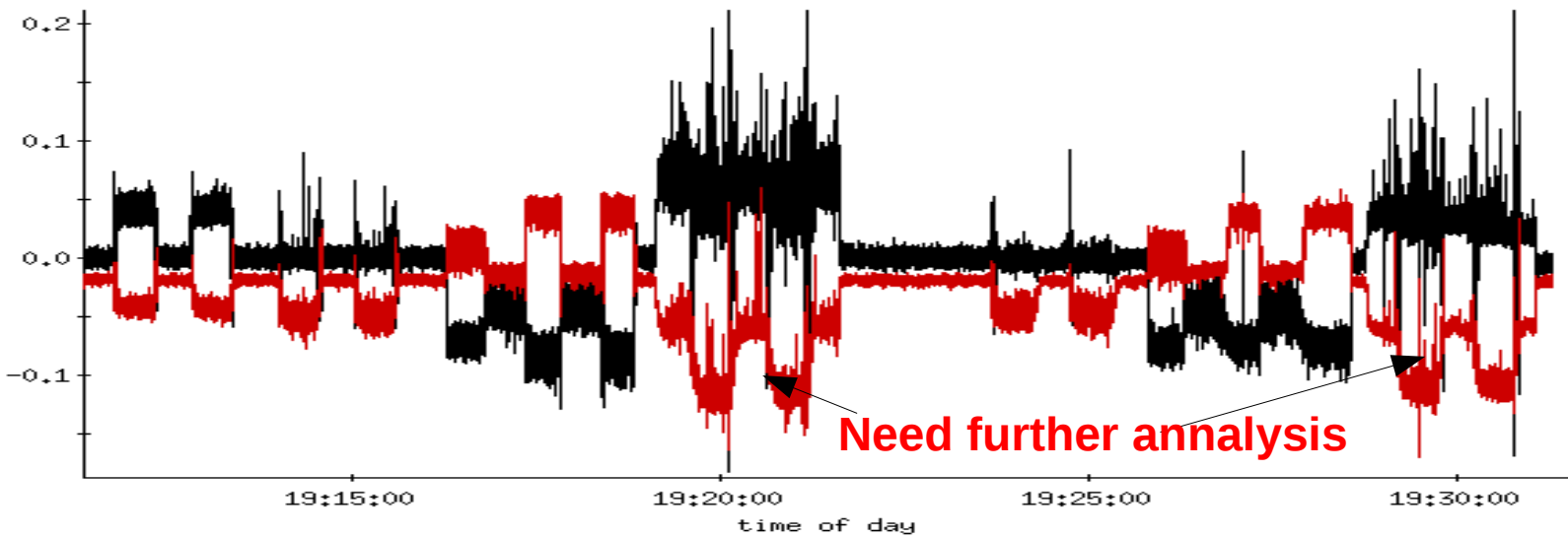
Wed Apr 4 2012



one beta* measurement.

— qLoopTune2.bh:tuneBuffM[*] — qLoopTune2.bv:tuneBuffM[*]

Wed Apr 4 2012



Need further annalysis

— qLoopCoupling2.bf2:deltaStrengthBuffM[*] — qLoopCoupling2.bf13:deltaStrengthBuffM[*]