Beta* squeeze

Development: December 18
APEX: December 18-19

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+ Operations

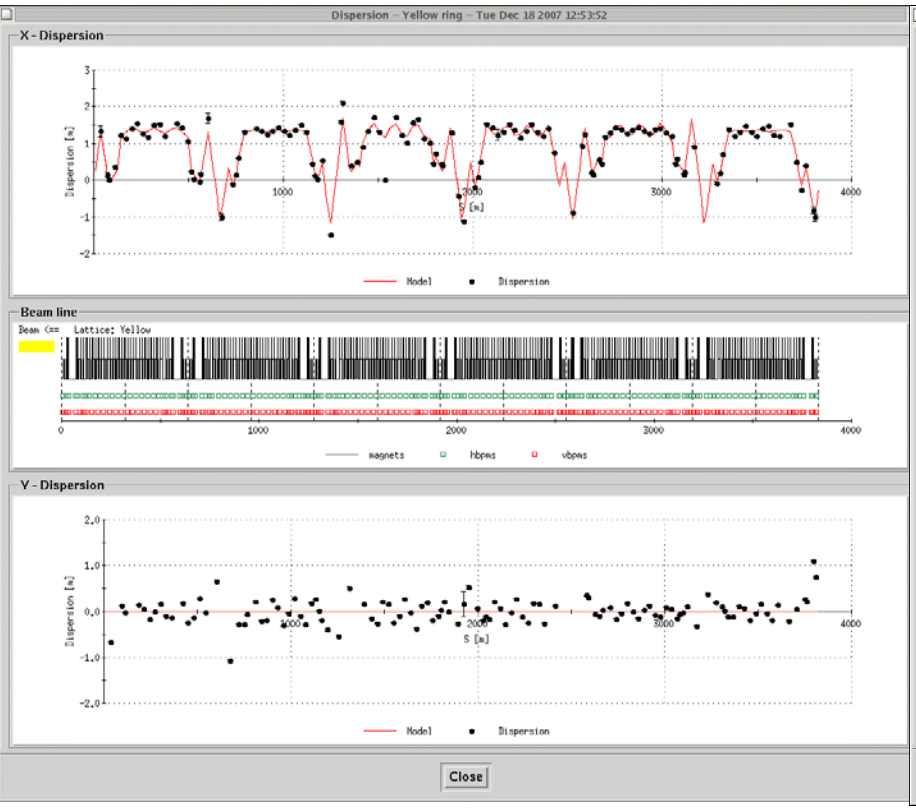
Development – December 18 – the plan

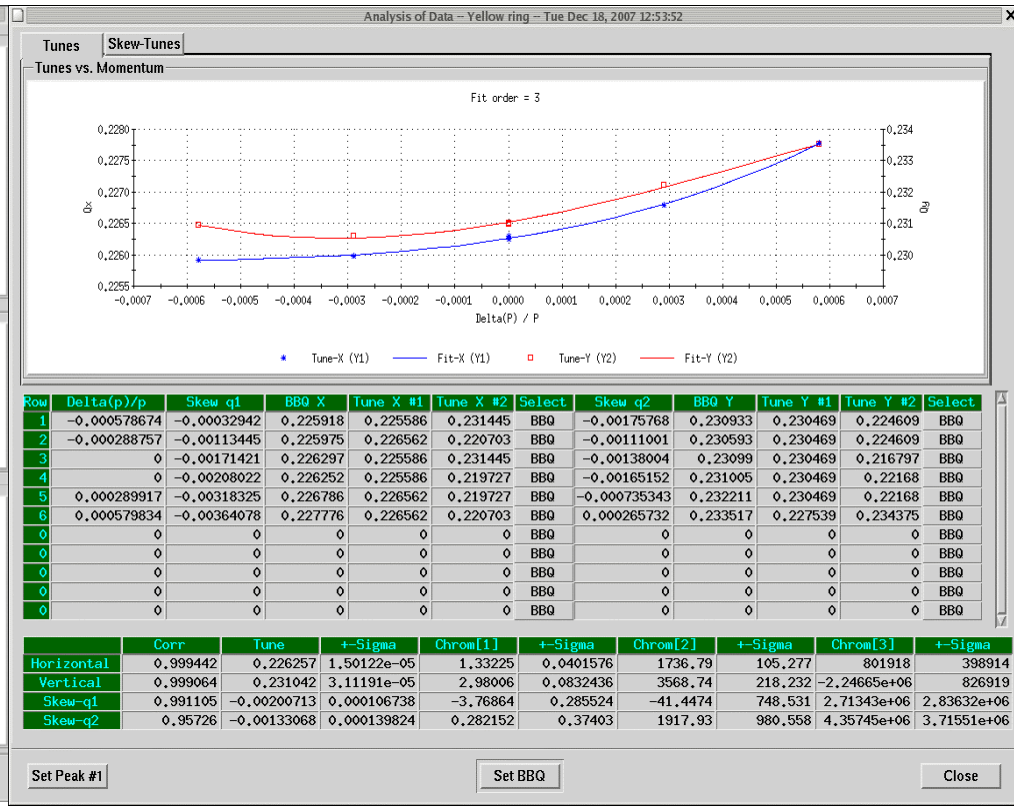
æ 09:49 **Plan for the beta* development**

Dump store at 10am
Go to zero - load ramp dAu82
go to injection
1 or 2 hysteresis cycles to take ramp data (Don, Wing)
slowfactor 2
Go to injection - load dAu81
hysteresis cycle
physics-like ramp (87x1.1 both rings)
lifetime - steering - collimation - rates
if successful, keep dAu81
if not, revert to dAu80 (needs Don) -Fulvia

Development – December 18

- First 6x6 up without replay
- 6x6 with replay OK





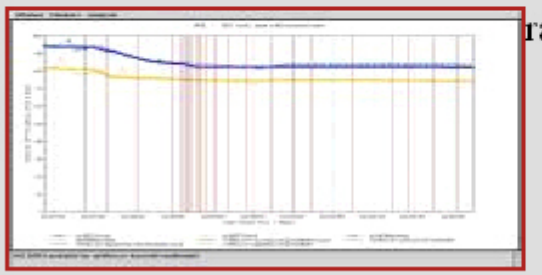
Row	Delta(p)/p	Skew q1	BBQ X	Tune X #1	Tune X #2	Select	Skew q2	BBQ Y	Tune Y #1	Tune Y #2	Select
1	-0.000578674	-0.00032942	0.225918	0.225586	0.231445	BBQ	-0.00175768	0.230933	0.230469	0.224609	BBQ
2	-0.000288757	-0.00113445	0.225975	0.226562	0.220703	BBQ	-0.00111001	0.230593	0.230469	0.224609	BBQ
3	0	-0.00171421	0.226297	0.225586	0.231445	BBQ	-0.00138004	0.23099	0.230469	0.216797	BBQ
4	0	-0.00208022	0.226252	0.225586	0.219727	BBQ	-0.00165152	0.231005	0.230469	0.22168	BBQ
5	0.000289917	-0.00318325	0.226786	0.226562	0.219727	BBQ	-0.000735343	0.232211	0.230469	0.22168	BBQ
6	0.000579834	-0.00364078	0.227776	0.226562	0.220703	BBQ	0.000265732	0.233517	0.227539	0.234375	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
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	0.999442	0.226257	1.50122e-05	1.33225	0.0401576	1736.79	105.277	801918	398914
Vertical	0.999064	0.231042	3.11191e-05	2.98006	0.0832436	3568.74	218.232	-2.24665e+06	826919
Skew-q1	0.991105	-0.00200713	0.000106738	-3.76864	0.285524	-41.4474	748.531	2.71343e+06	2.83632e+06
Skew-q2	0.95726	-0.00133068	0.000139824	0.282152	0.37403	1917.93	980.558	4.35745e+06	3.71551e+06

Development – December 18

Ring	Bunches/Cycles	Avg Bunch in RHIC (10^6 ions)	Avg Efficiency XCBM to RHIC	Uline xemit	Uline yemit
Blue	87/23	116100	0.869	0.00	0.00
Yellow	87/23	998	0.882	0.00	0.00

-AutoEntry

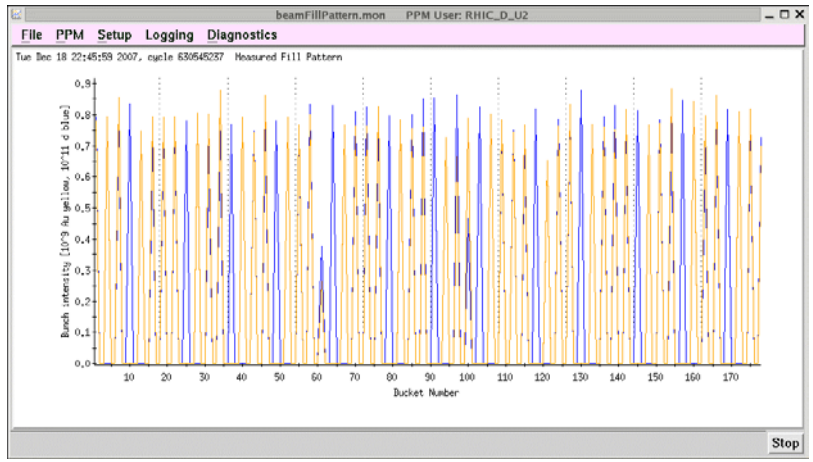
æ 14:33  ramp data from BeamIons log -tape

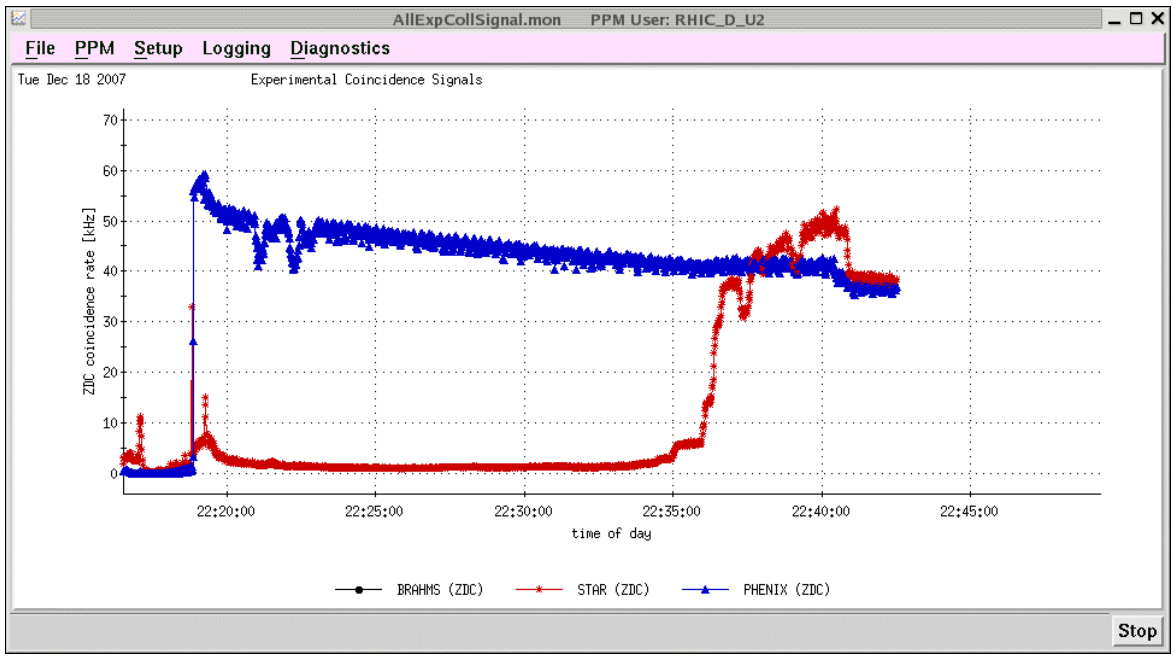
æ 14:33 Beam Abort, 7w-ps2.A dropped {Loss Monitor 1} -Sequencer

First attempt at physics ramp – lost on losses → BLAM
Reverted to dAu80 to allow physics till APEX time
Turned out a change of blue store tune done for AC dipole was not reverted……

APEX – physics ramp 1

Ring	Bunches/Cycles	Avg Bunch in RHIC (10^6 ions)	Avg Efficiency XCBM to RHIC
Blue	87/23	105101	0.866
Yellow	87/23	905	0.914

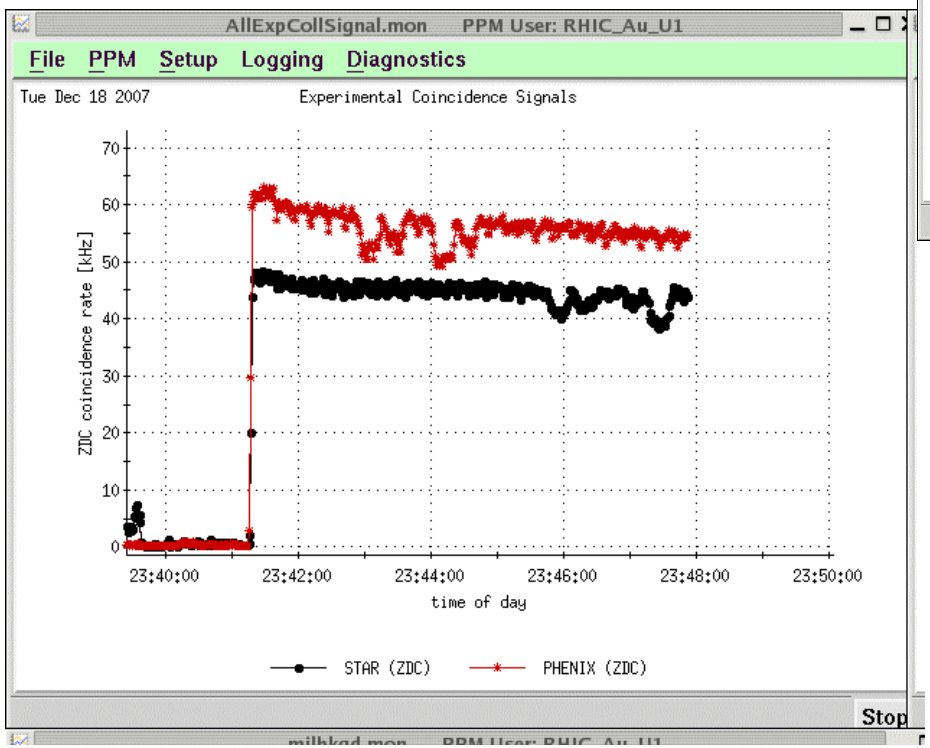


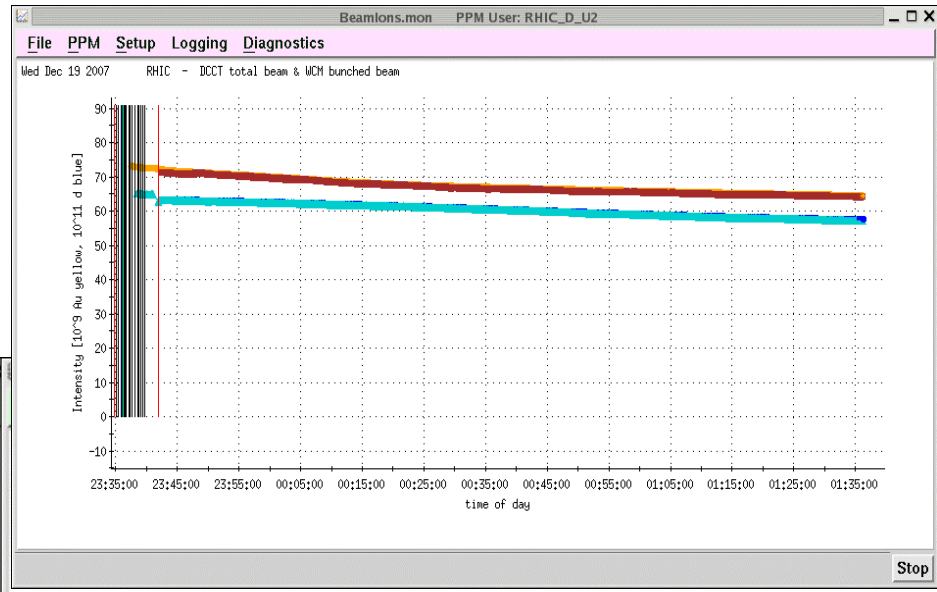


Rates lower than expected from beam Intensity
→Finally noticed a fill pattern error..

APEX – physics ramp 2

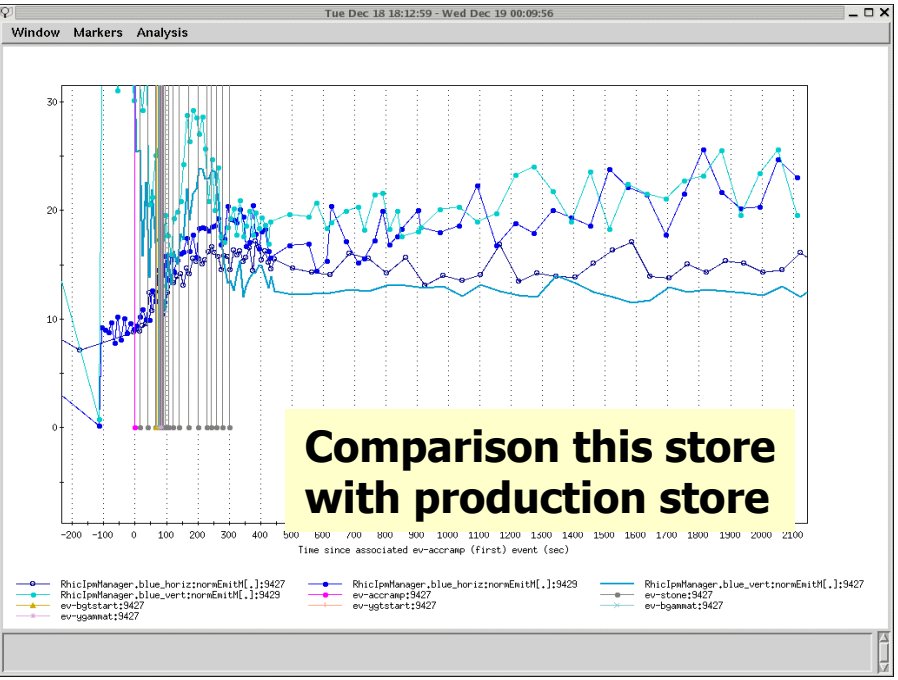
Ring	Bunches/Cycles	Avg Bunch in RHIC (10^6 ions)	Avg Efficiency XCBM to RHIC
Blue	87/22	101607	0.887
Yellow	87/22	964	0.863

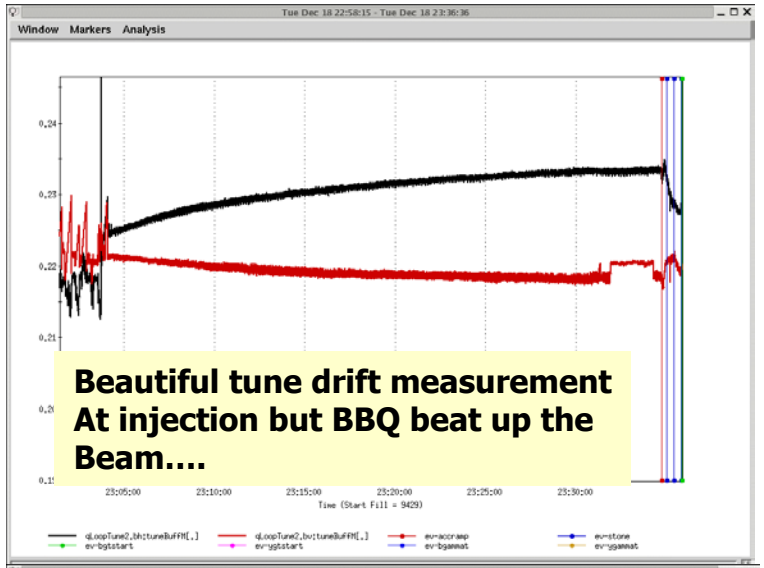


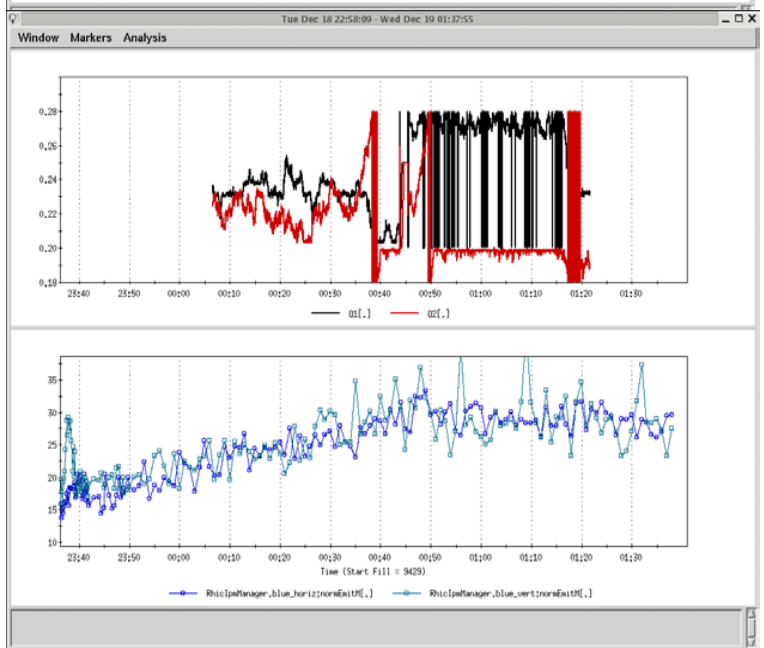


Good transmission and lifetime but rates short of expectation .....blue emittance

APEX physics ramp 2 - emittance



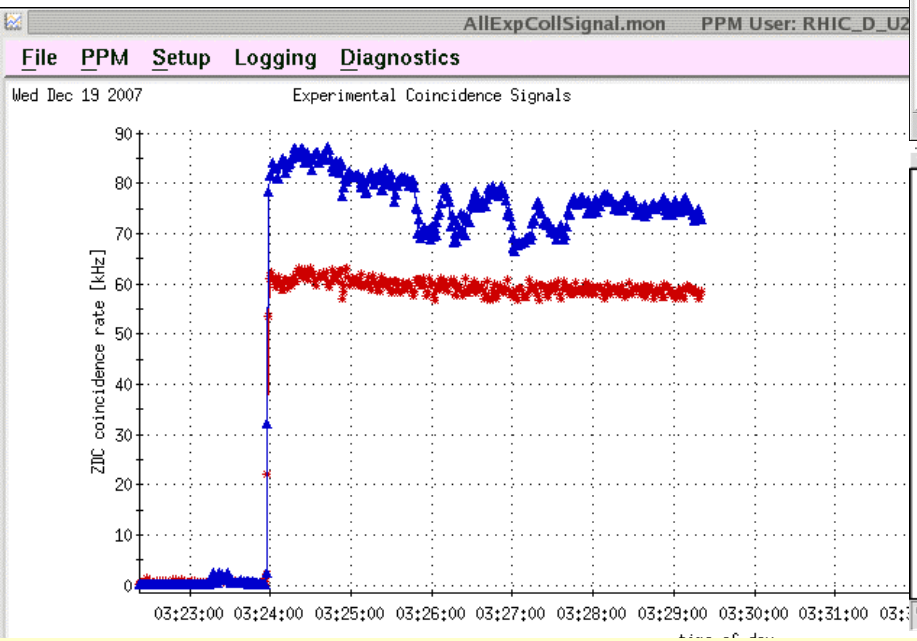


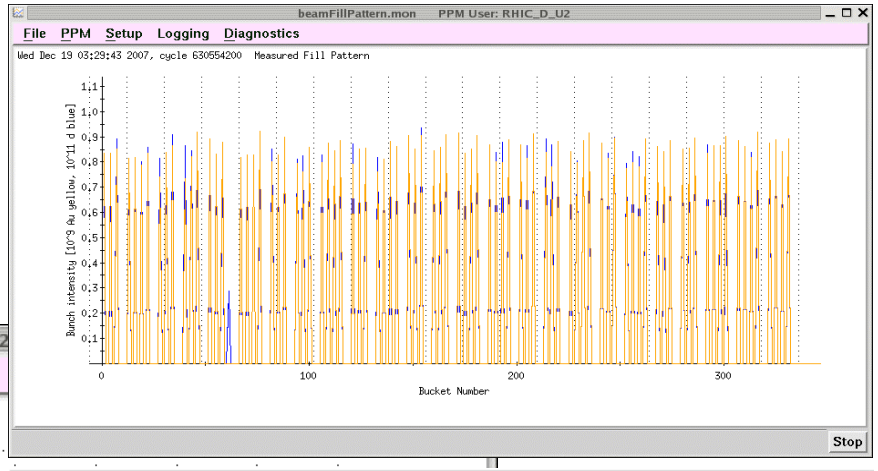


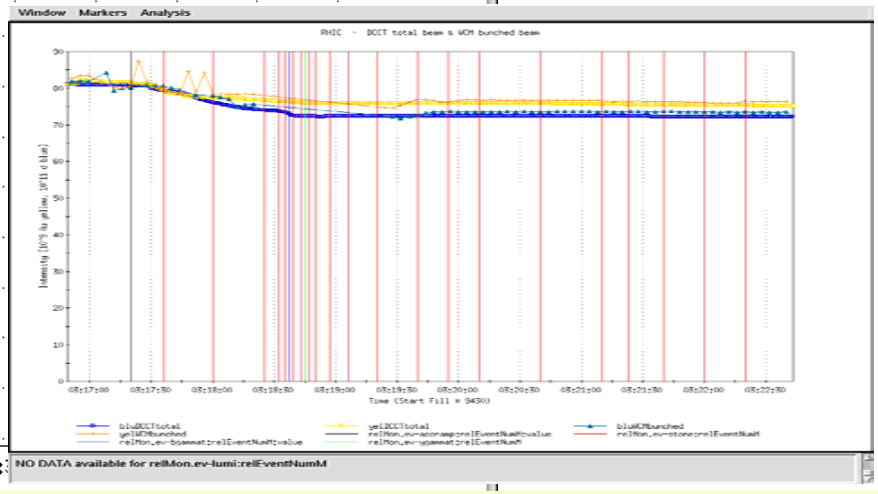
Decided to try again

APEX physics ramp 3

Ring	Bunches/Cycles	Avg Bunch in RHIC (10^6 ions)
Blue	79/21	105526
Yellow	87/23	964

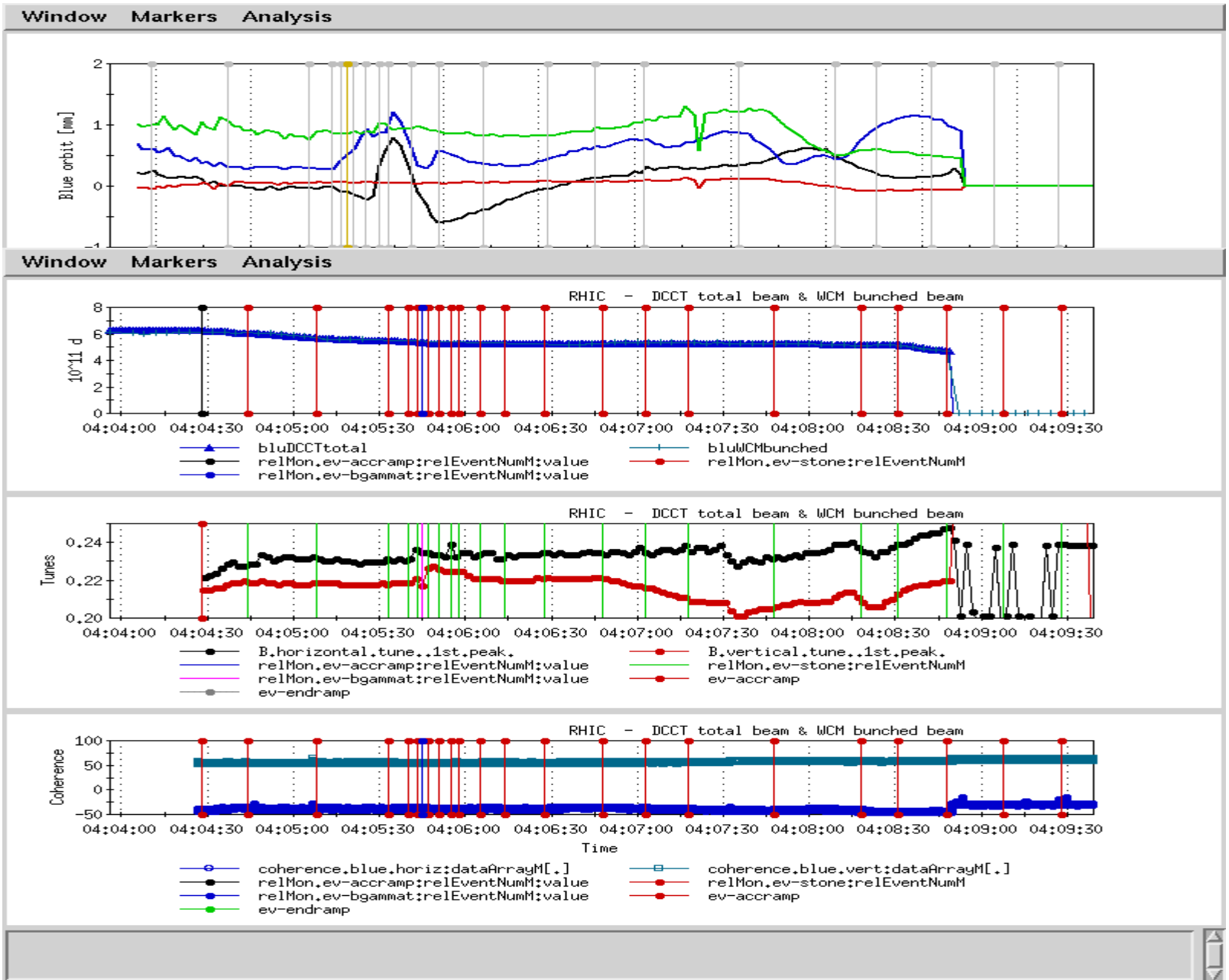




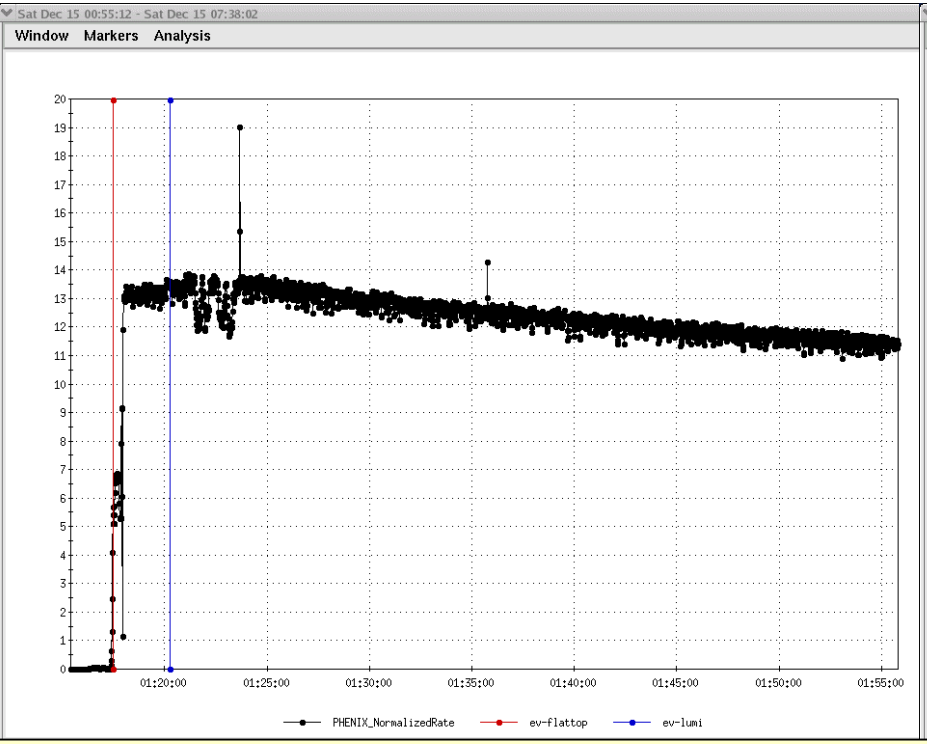


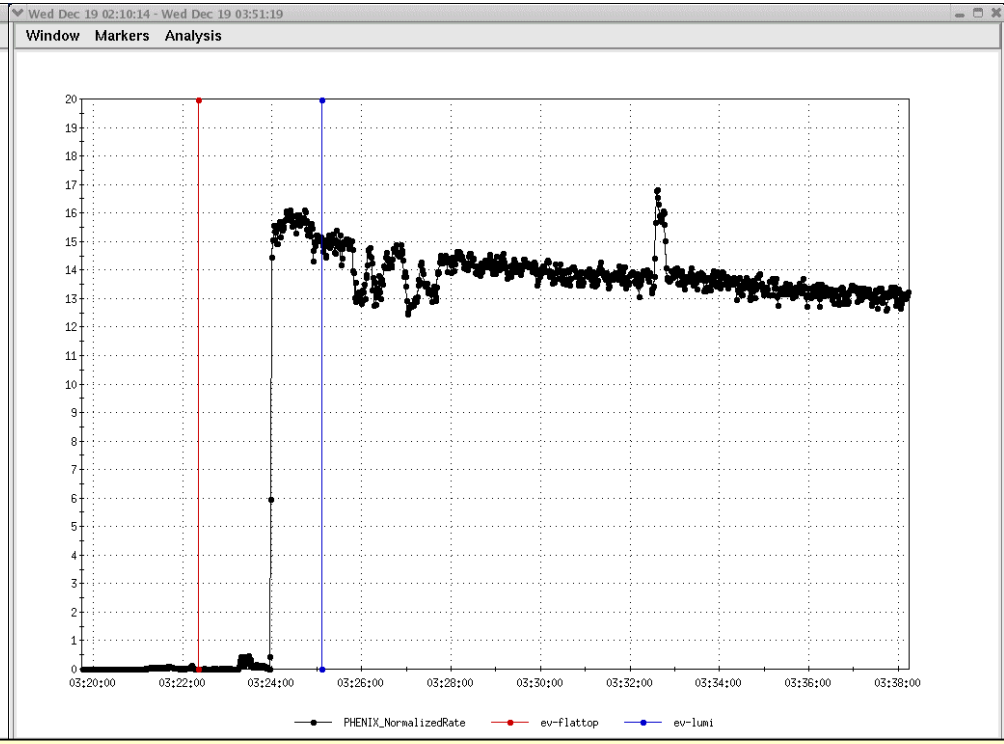
æ Dec-19-2007 03:45 The physics ramp with dAu81 yielded initial rates of ~85 KHz (extrapolating Phenix after optimization) with an average bunch intensity at store of ~0.85. Cogging, rebucketing, steering and collimation all worked. So this ramp can be used for physics if we decide to do that. -Fulvia, TJS, VL, Dejan, ST

APEX: last minute test dAu82…



Comparison collision rates (VP)





14:15 Concerning Kip 's note for 3:29am e-log entry. Shown here are **normalized PHENIX rates** (normalized on product of beam currents) for store **9399 (left)** and the store **9430 (right).** Store 9430 was with reduced by ~30% Yellow beta-functions, so one should expect **~15%** luminosity gain. And even not considering possible difference in the emittance between those two stores, the normalized rates at the very beginning of 9430 are higher that on 9399 by the amount close to the expected 15% (15.5/13.5 =1.15). -VP