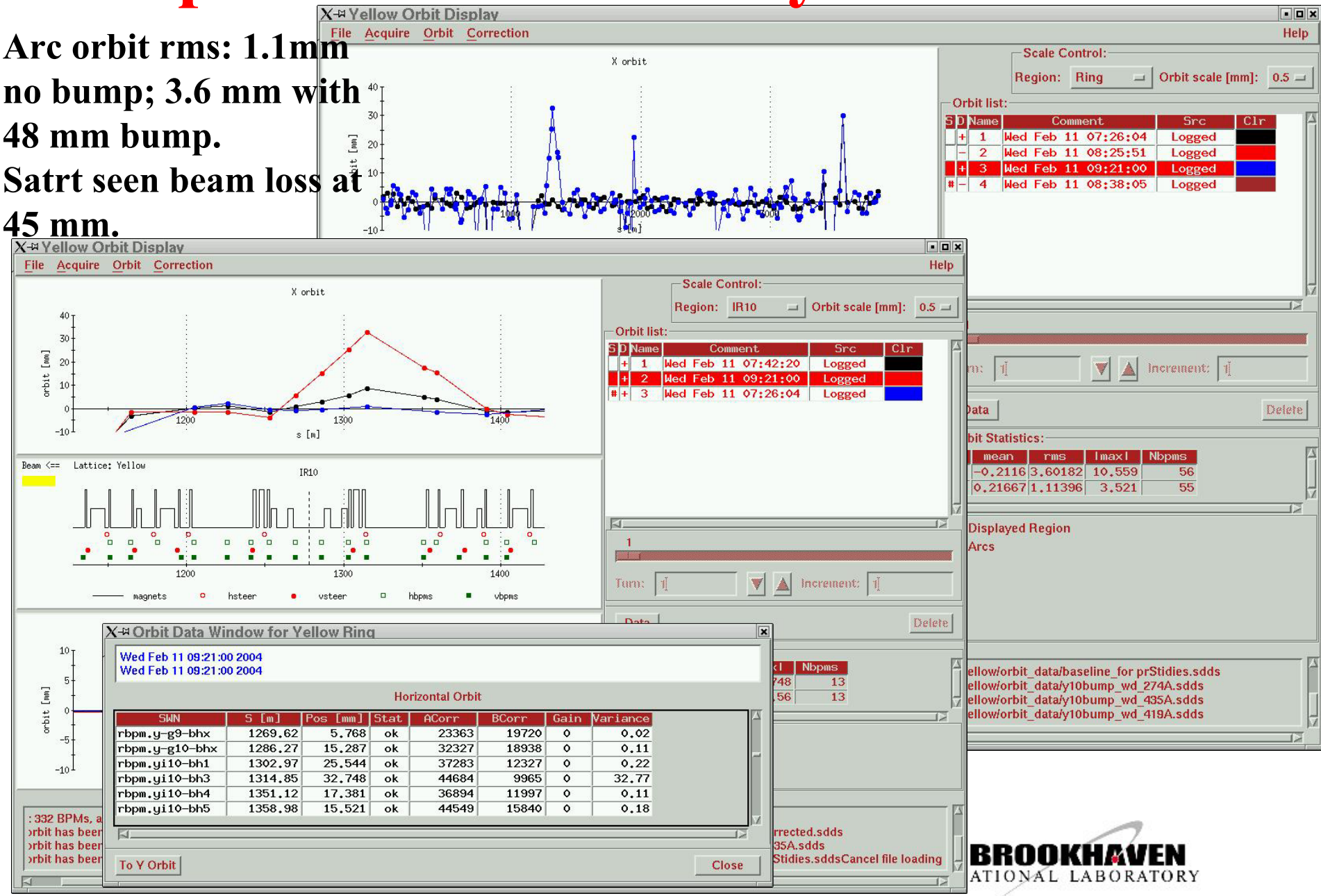
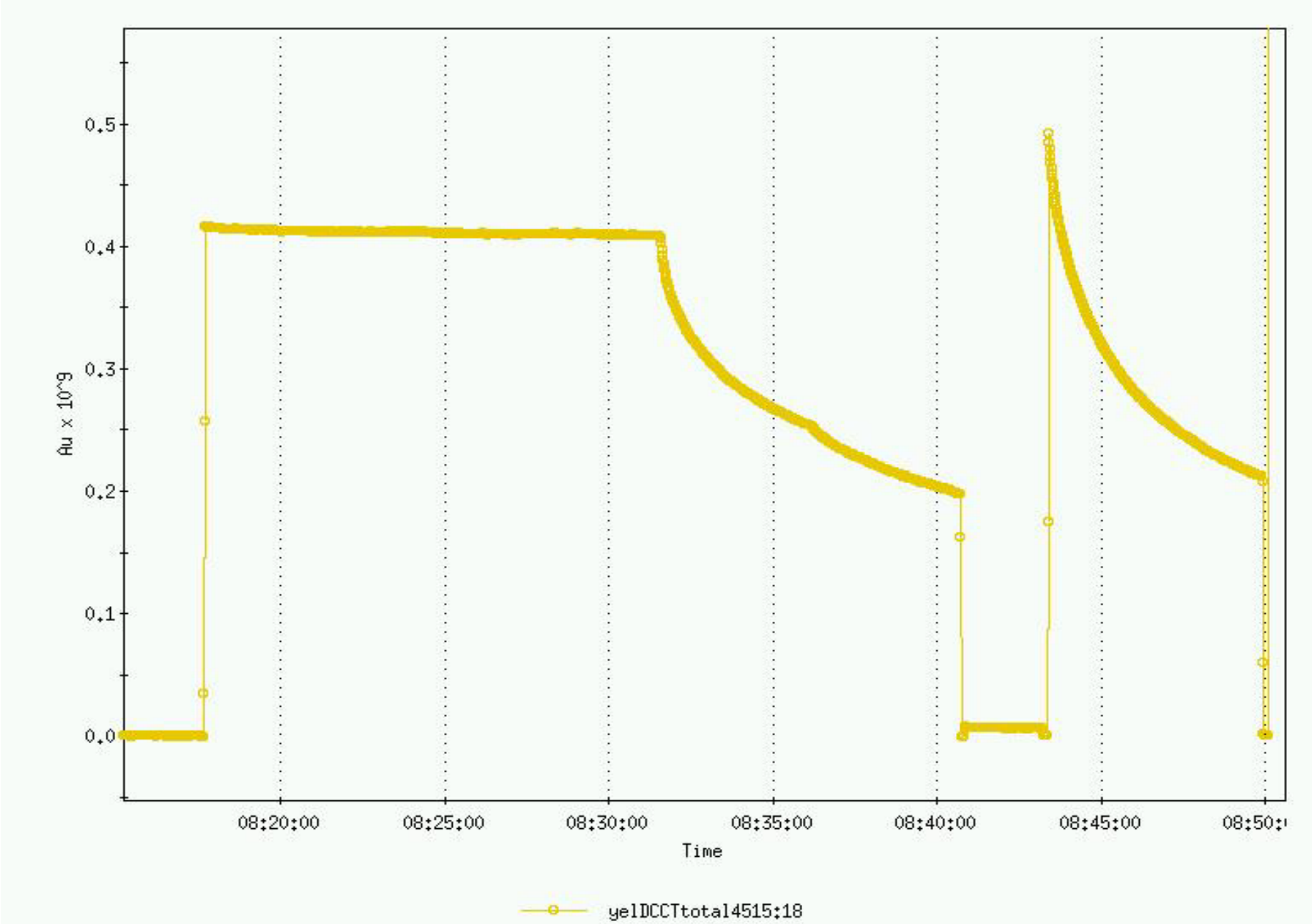
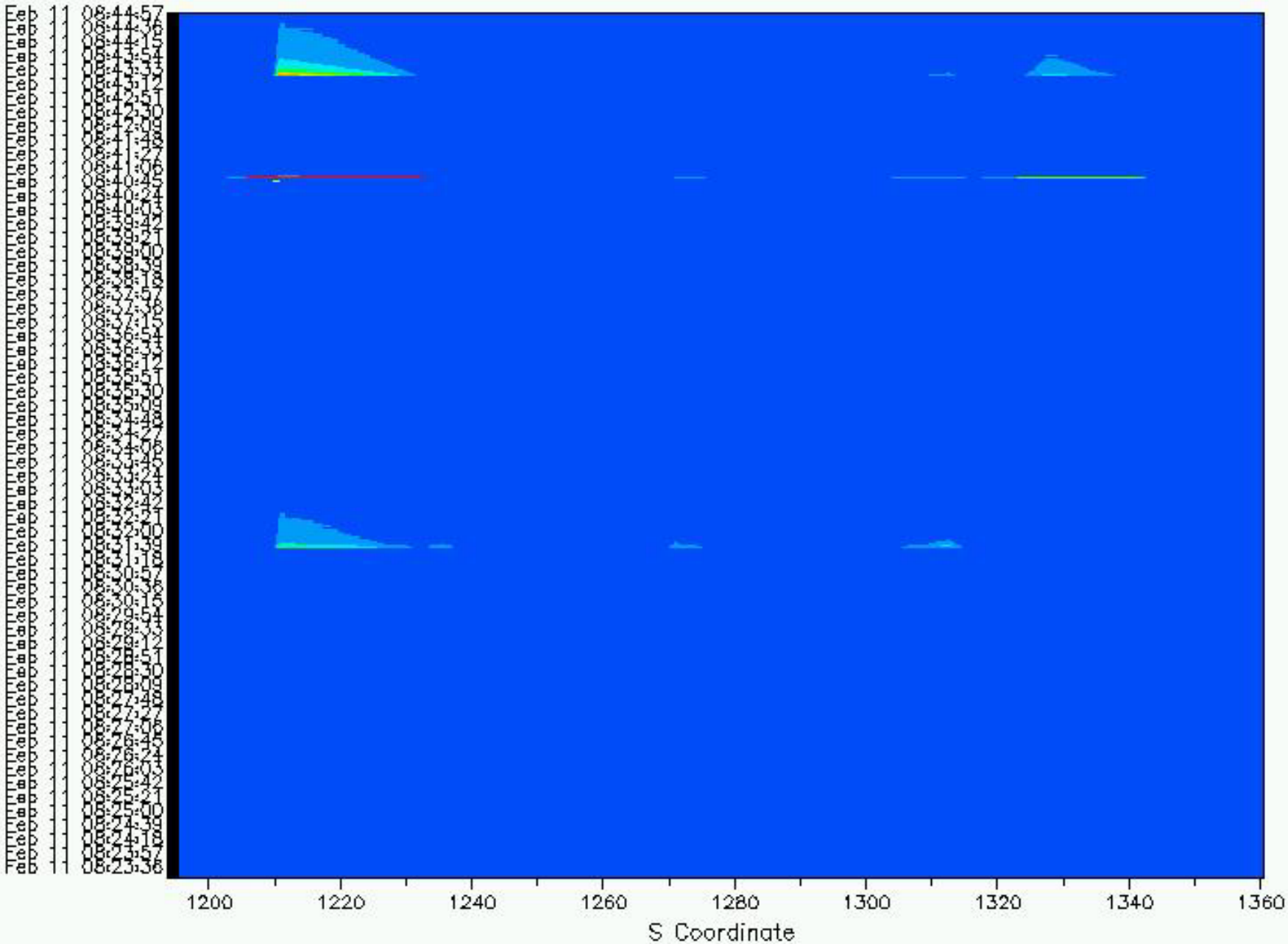
Bumps Used in the Study

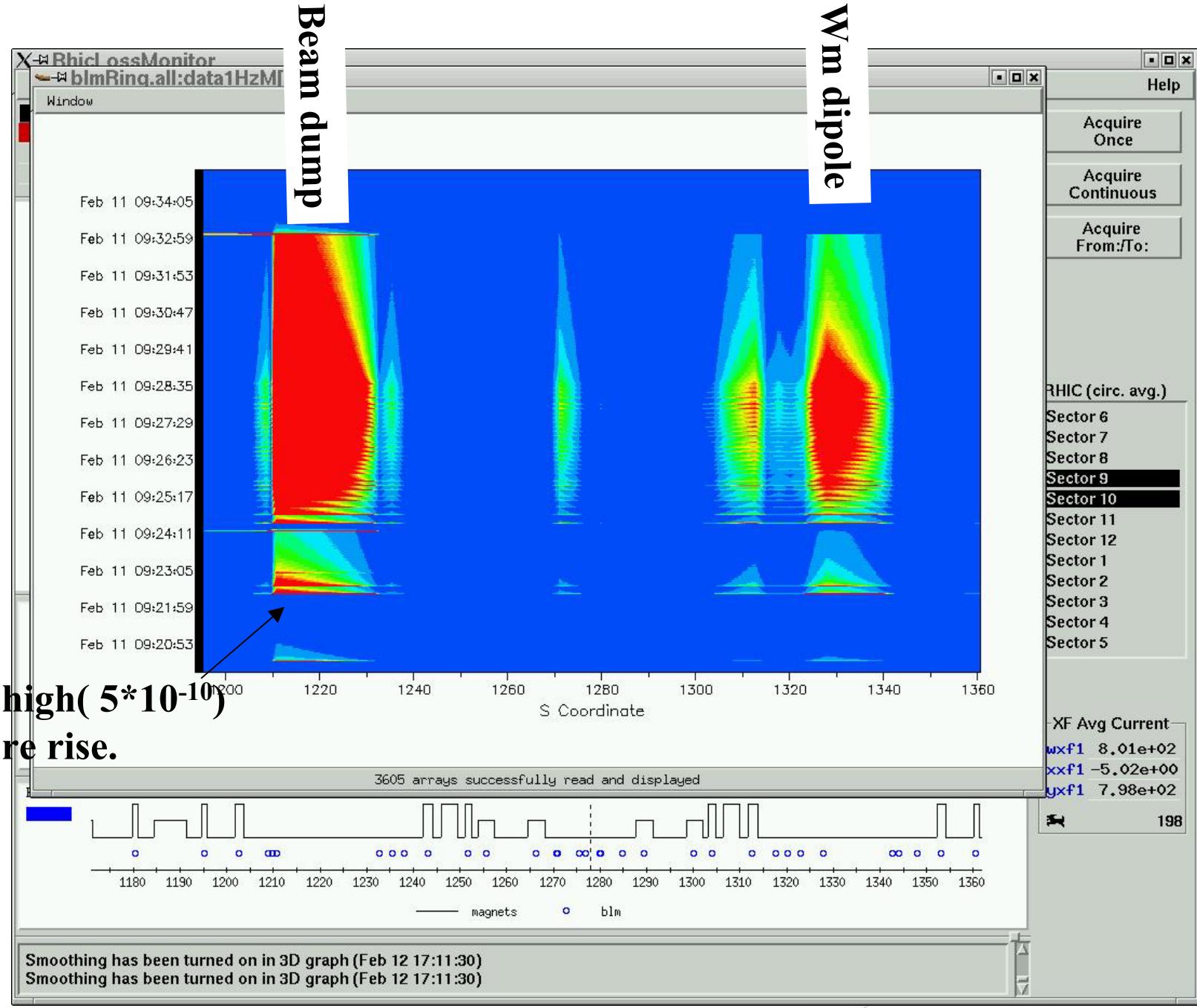
Arc orbit rms: 1.1mm no bump; 3.6 mm with 48 mm bump.
Satrt seen beam loss at 45 mm.



BROOKHAVEN NATIONAL LABORATORY

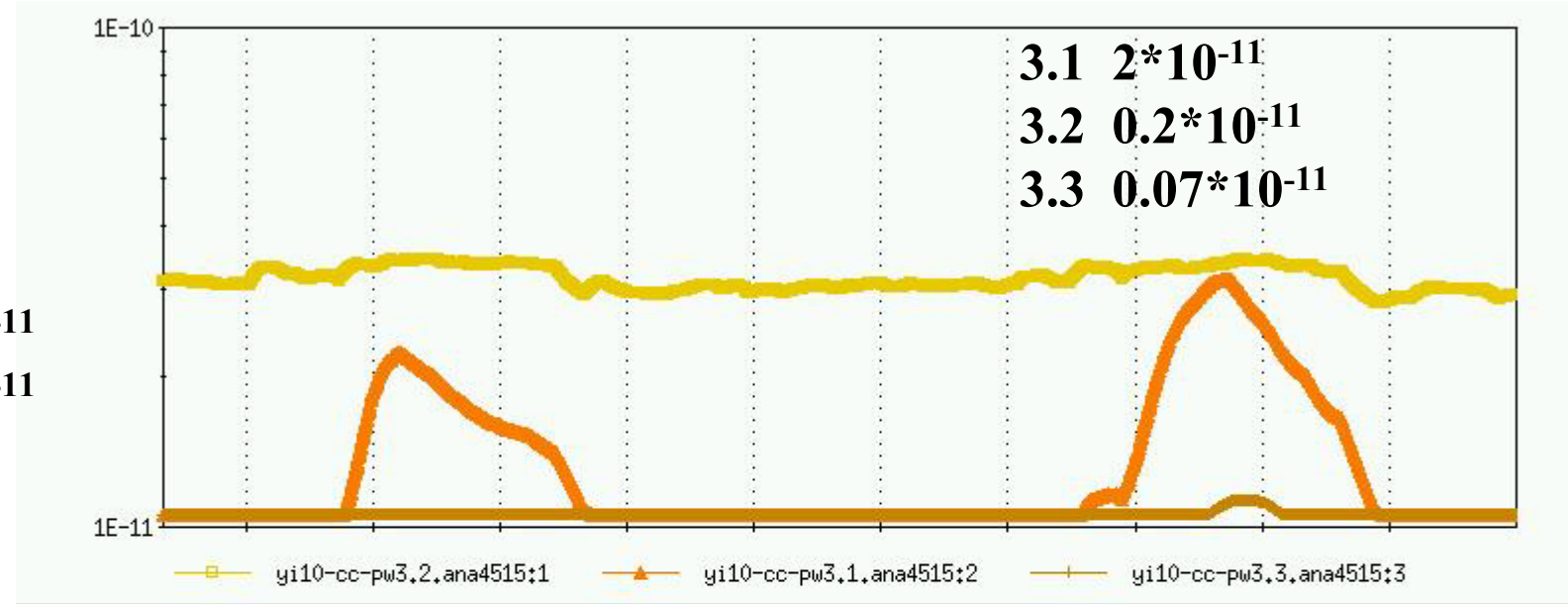

0.5
0.4
0.3
0.2
0.1
0.0
Au x 10^9
08:20:00
08:25:00
08:30:00
08:35:00
08:40:00
08:45:00
Time
yelDCCTtotal4515:18

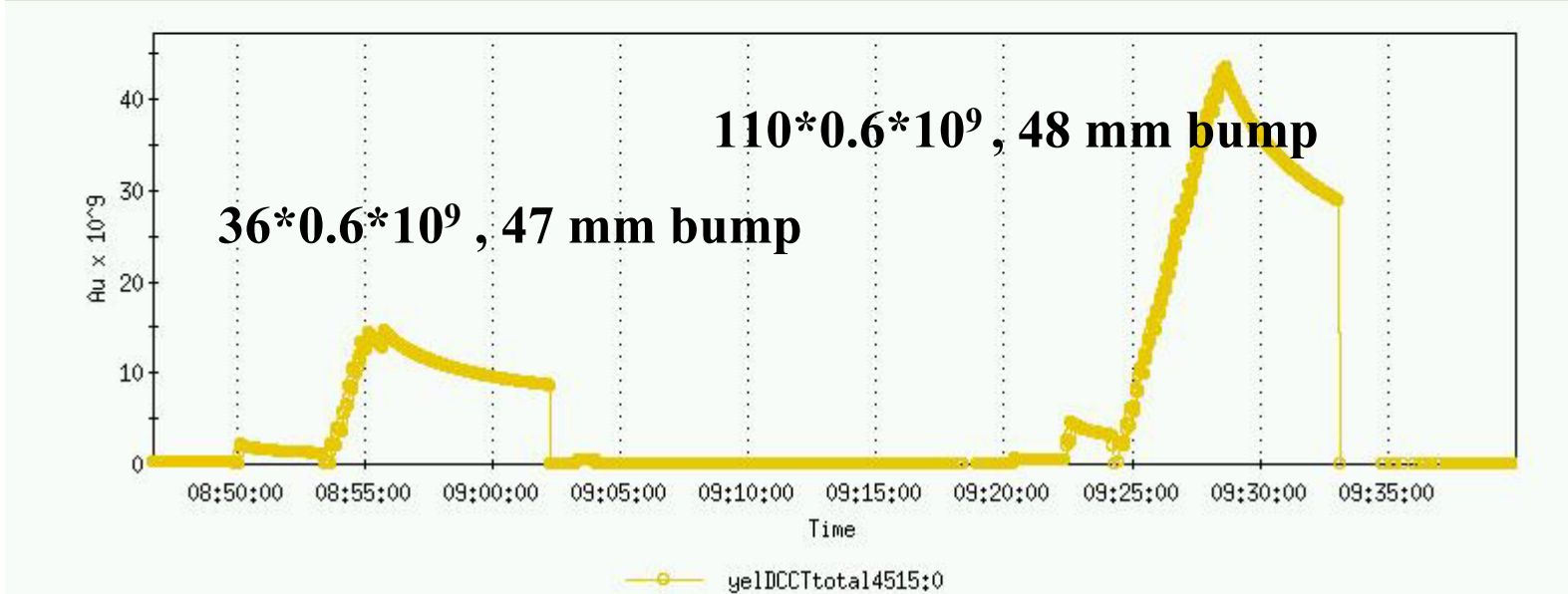

Feb 11 08:44:57
Feb 11 08:44:36
Feb 11 08:44:15
Feb 11 08:43:54
Feb 11 08:43:33
Feb 11 08:43:12
Feb 11 08:42:51
Feb 11 08:42:30
Feb 11 08:42:09
Feb 11 08:41:48
Feb 11 08:41:27
Feb 11 08:41:06
Feb 11 08:40:45
Feb 11 08:40:24
Feb 11 08:40:03
Feb 11 08:39:42
Feb 11 08:39:21
Feb 11 08:39:00
Feb 11 08:38:39
Feb 11 08:38:18
Feb 11 08:37:57
Feb 11 08:37:36
Feb 11 08:37:15
Feb 11 08:36:54
Feb 11 08:36:33
Feb 11 08:36:12
Feb 11 08:35:51
Feb 11 08:35:30
Feb 11 08:35:09
Feb 11 08:34:48
Feb 11 08:34:27
Feb 11 08:34:06
Feb 11 08:33:45
Feb 11 08:33:24
Feb 11 08:33:03
Feb 11 08:32:42
Feb 11 08:32:21
Feb 11 08:32:00
Feb 11 08:31:39
Feb 11 08:31:18
Feb 11 08:30:57
Feb 11 08:30:36
Feb 11 08:30:15
Feb 11 08:29:54
Feb 11 08:29:33
Feb 11 08:29:12
Feb 11 08:28:51
Feb 11 08:28:30
Feb 11 08:28:09
Feb 11 08:27:48
Feb 11 08:27:27
Feb 11 08:27:06
Feb 11 08:26:45
Feb 11 08:26:24
Feb 11 08:26:03
Feb 11 08:25:42
Feb 11 08:25:21
Feb 11 08:25:00
Feb 11 08:24:39
Feb 11 08:24:18
Feb 11 08:23:57
Feb 11 08:23:36
1200
1220
1240
1260
1280
1300
1320
1340
1360
S Coordinate



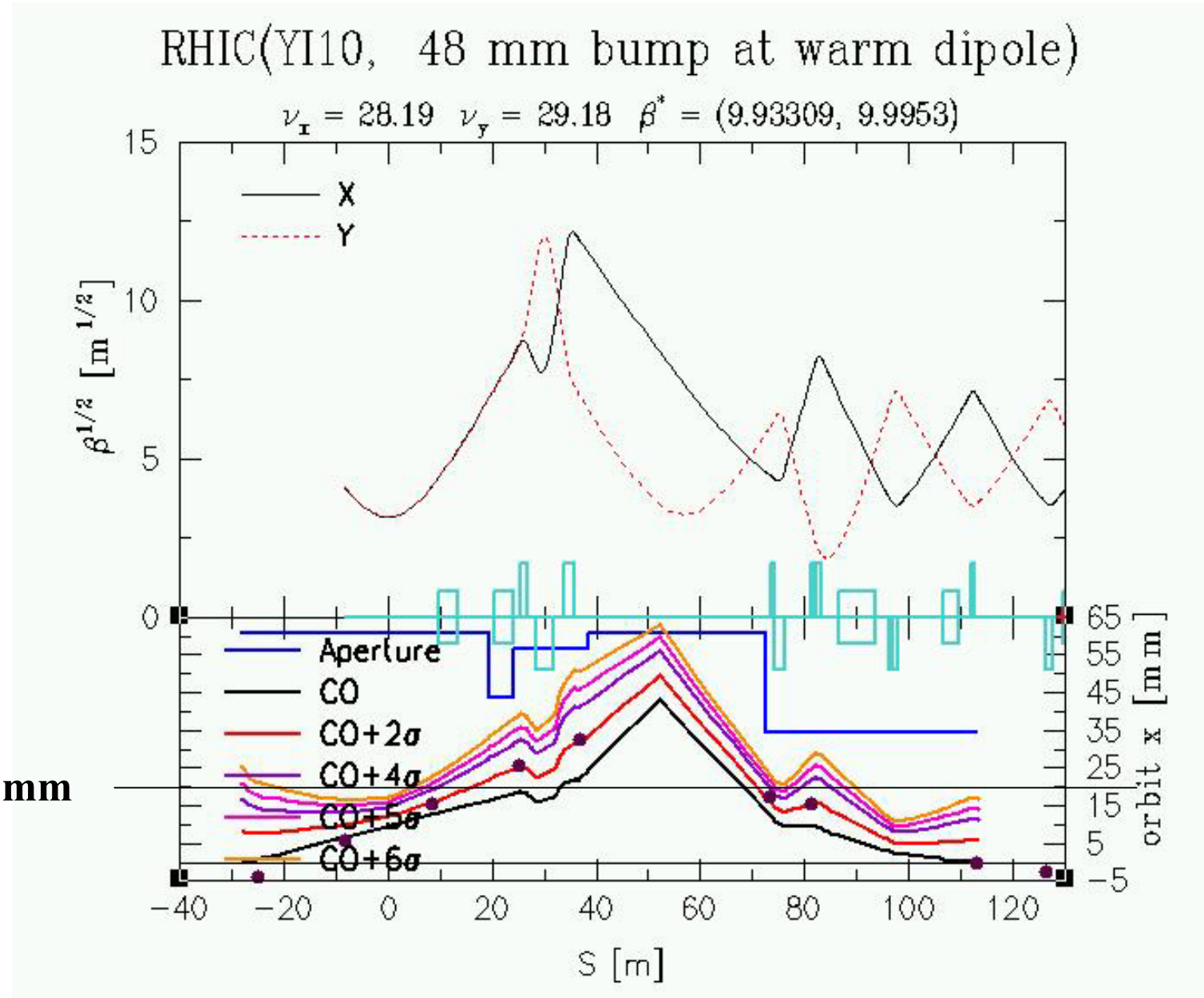
Baseline too high($5*10^{-10}$) to see pressure rise.

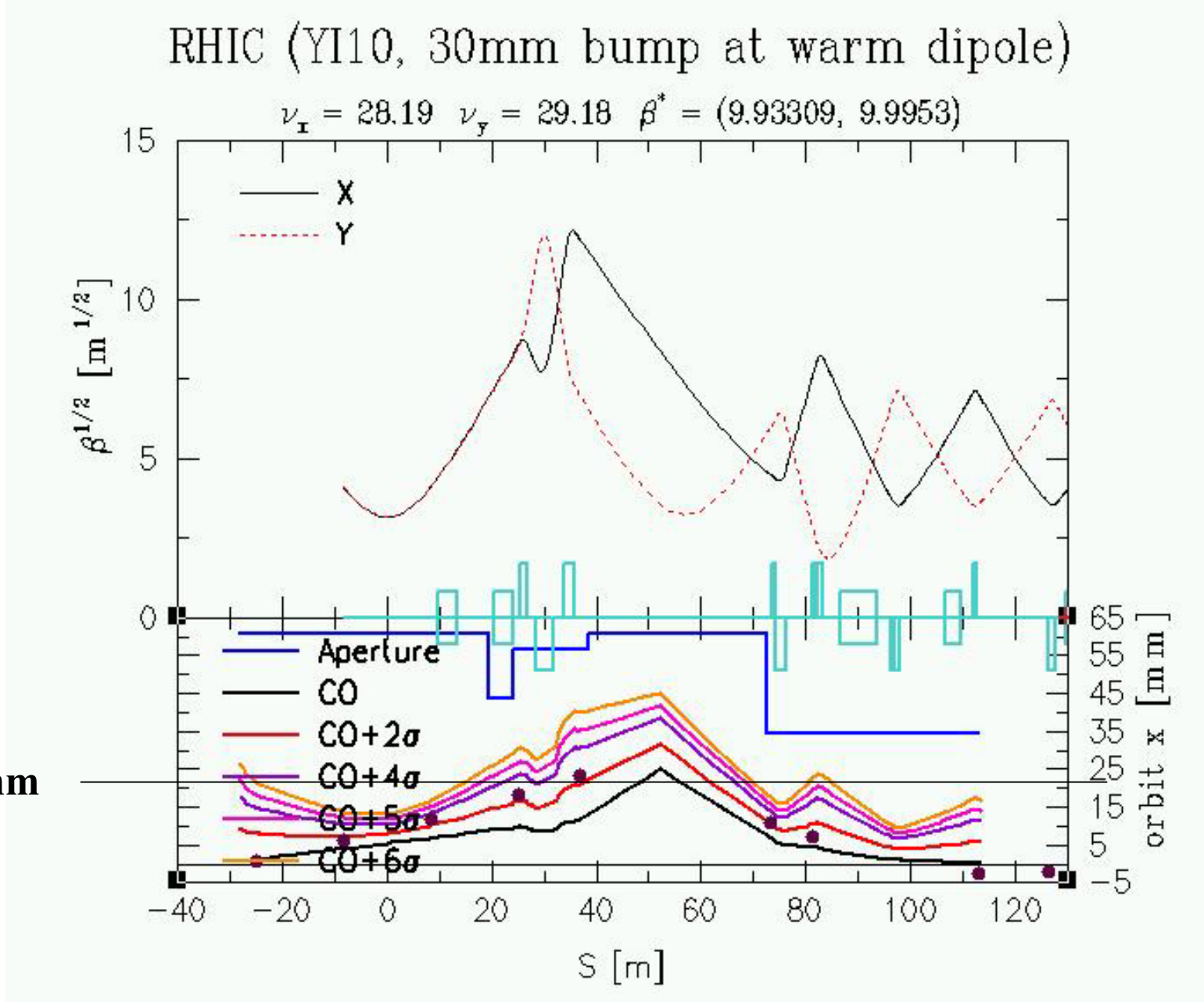
3.1 $1.2*10^{-11}$
3.2 $0.2*10^{-11}$
3.3 0.0





Why BPMs Show Larger Bump?



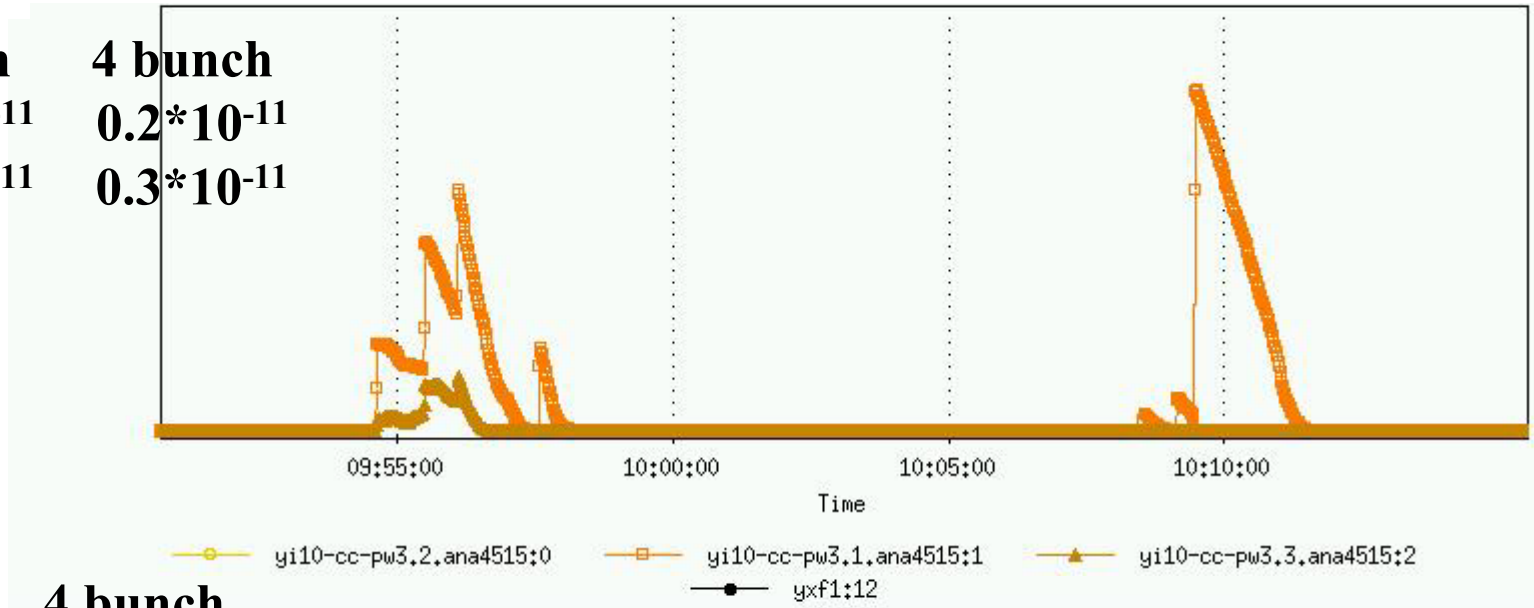

RHIC (YI10, 30mm bump at warm dipole)
ν_x = 28.19 ν_y = 29.18 β^* = (9.93309, 9.9953)
X
Y
$\beta^{1/2}$ [m$^{1/2}$]
Aperture
CO
CO+2σ
CO+4σ
CO+5σ
CO+6σ
orbit x [mm]
S [m]

20 mm

Same Old News: NEG Pipe Is Better

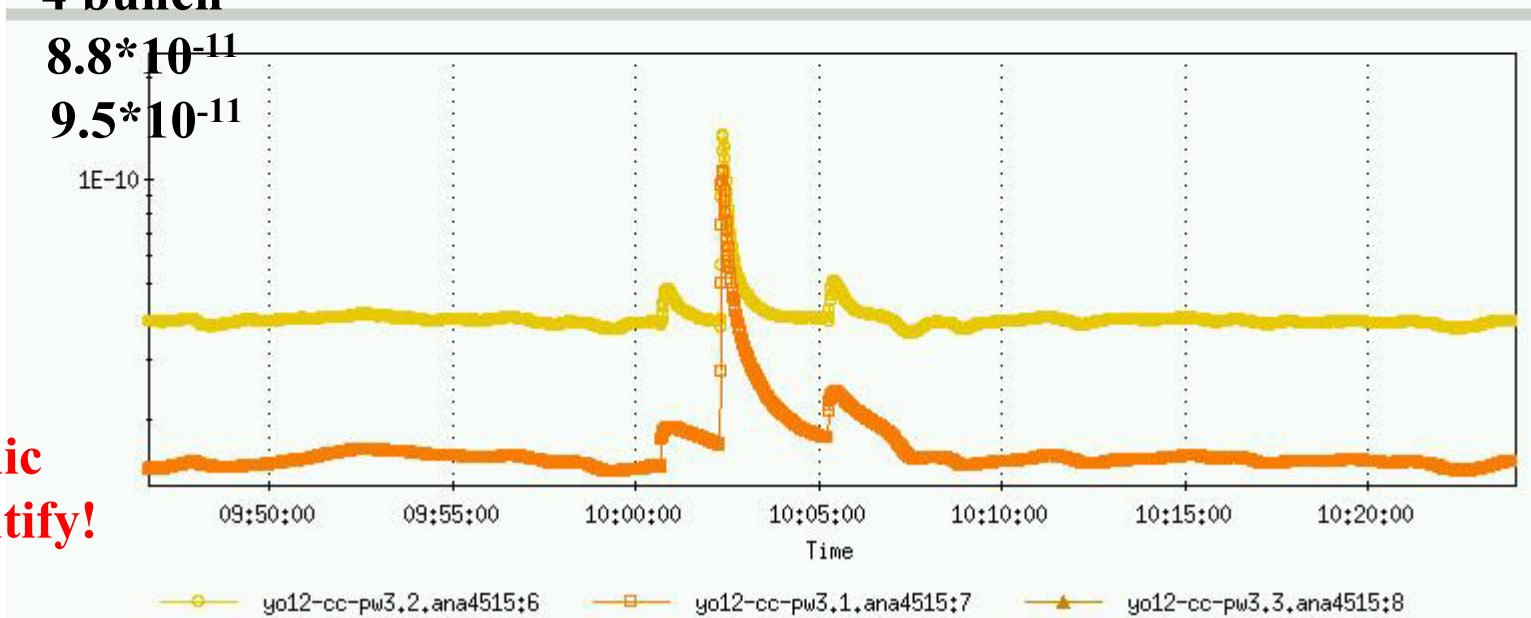
YI10

	1 bunch	4 bunch
3.1	$0.02*10^{-11}$	$0.2*10^{-11}$
3.2	$0.06*10^{-11}$	$0.3*10^{-11}$



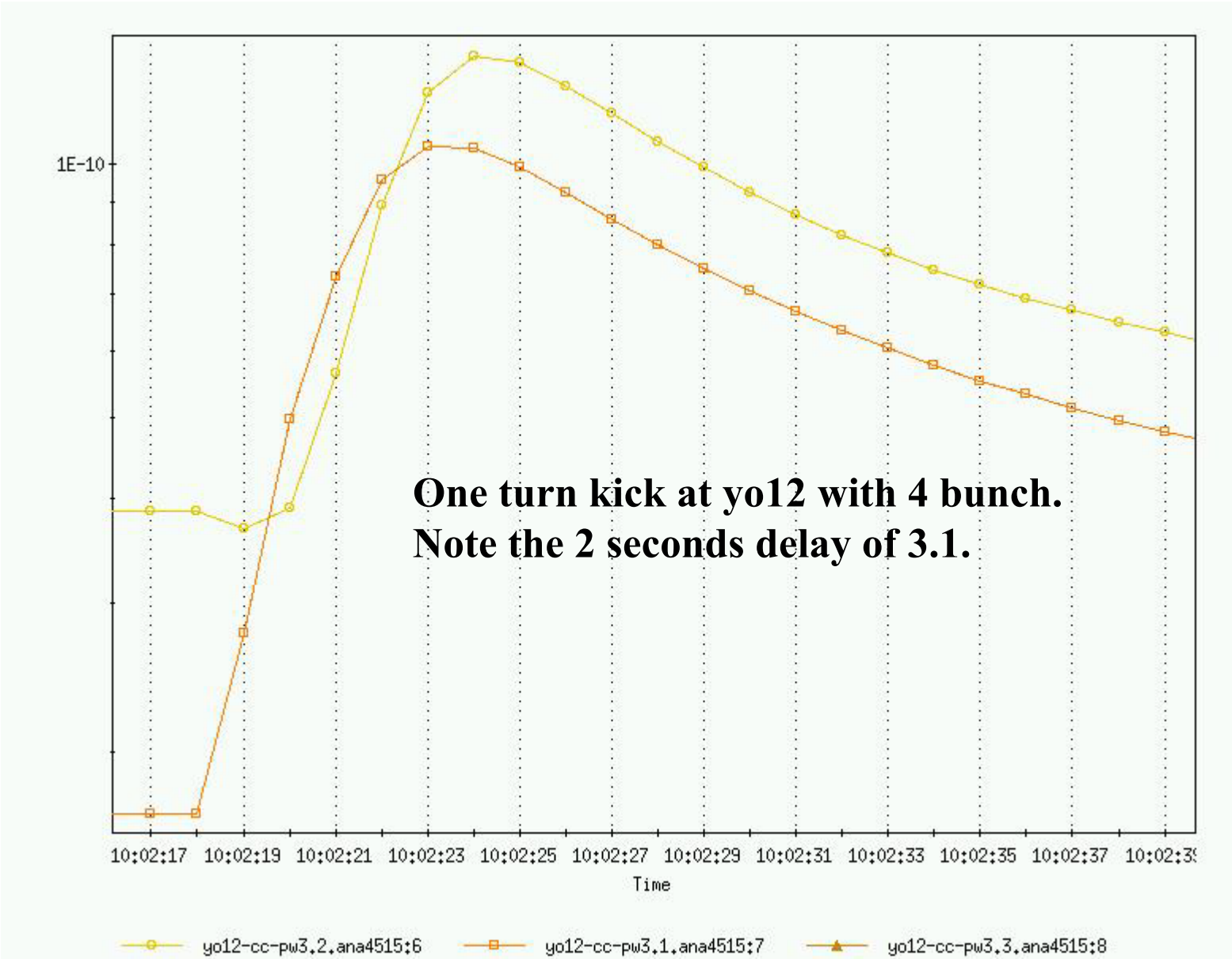
YO12

	1 bunch	4 bunch
3.1	$0.43*10^{-11}$	$8.8*10^{-11}$
3.2	$0.94*10^{-11}$	$9.5*10^{-11}$



Need a dynamic model to quantify!

Can We Develop a Dynamic Model?



One turn kick at yo12 with 4 bunch.
Note the 2 seconds delay of 3.1.

NEG Pipe Study (2/11/04)

- The experiment took about 3 hours and consists of two parts: warm dipole at yi10 and single turn kick at yi10 and yo12.
- With warm dipoles at YI10, generate bumps with amplitudes of 10, 20, 30 40, 45, 47 and 48 mm. Start seeing BLM counts at Warm dipole. Q3, G9 and beam dump with 45 mm. It is hard to judge which is beam loss and which is scattering shower.
- BPMs show consistently larger orbit excursion.
- Observed pressure rises at 3.1, when injecting multiple bunches.
- Bump beam to beam pipe with one turn kick at Q4 of YI10 and YO12. Interesting pressure rises observed.
- Plan to do the warm dipole with larger bending angle (with full strength) at warm dipole next time.