A look at IPM data before and after the dogleg & ORBUMP changes

Investigate “dip” at about ORBUMP turn off

Horizontal (x) IPM (calibrated)

Vertical (y) IPM (using x-calibration)

Configurations:

Old Booster (end of '02)

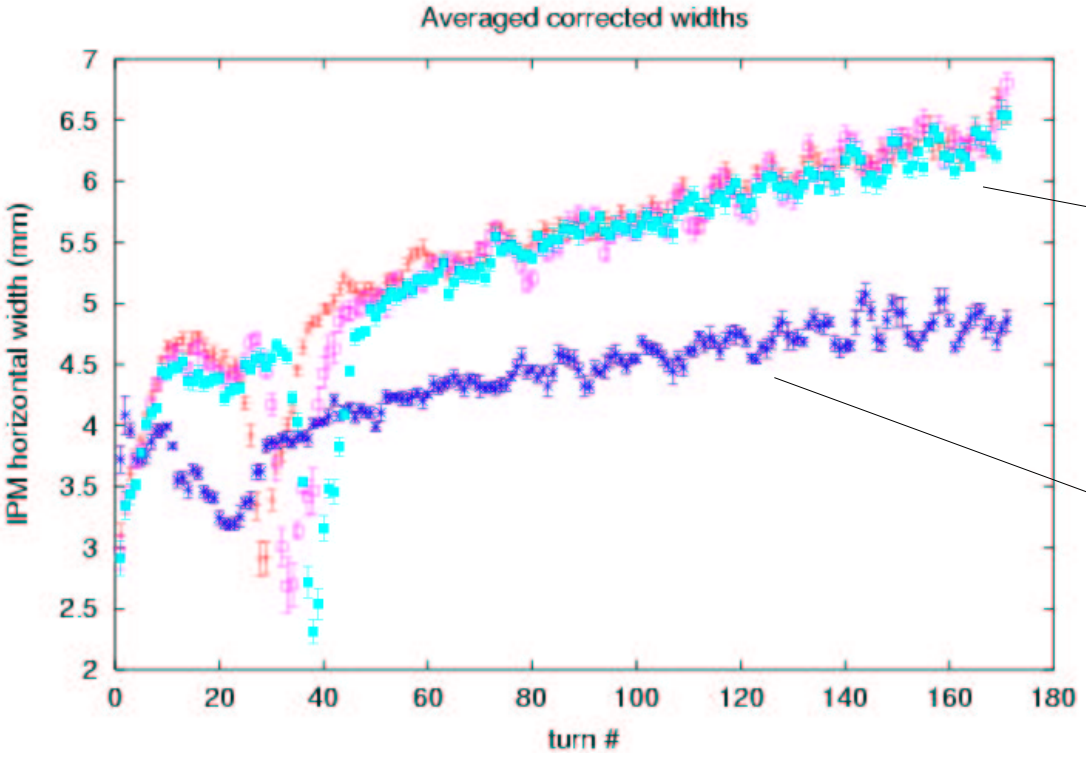
Booster after dogleg change

Booster after the shortening of ORBUMP pulse

BIG differences!

→ should monitor more often...

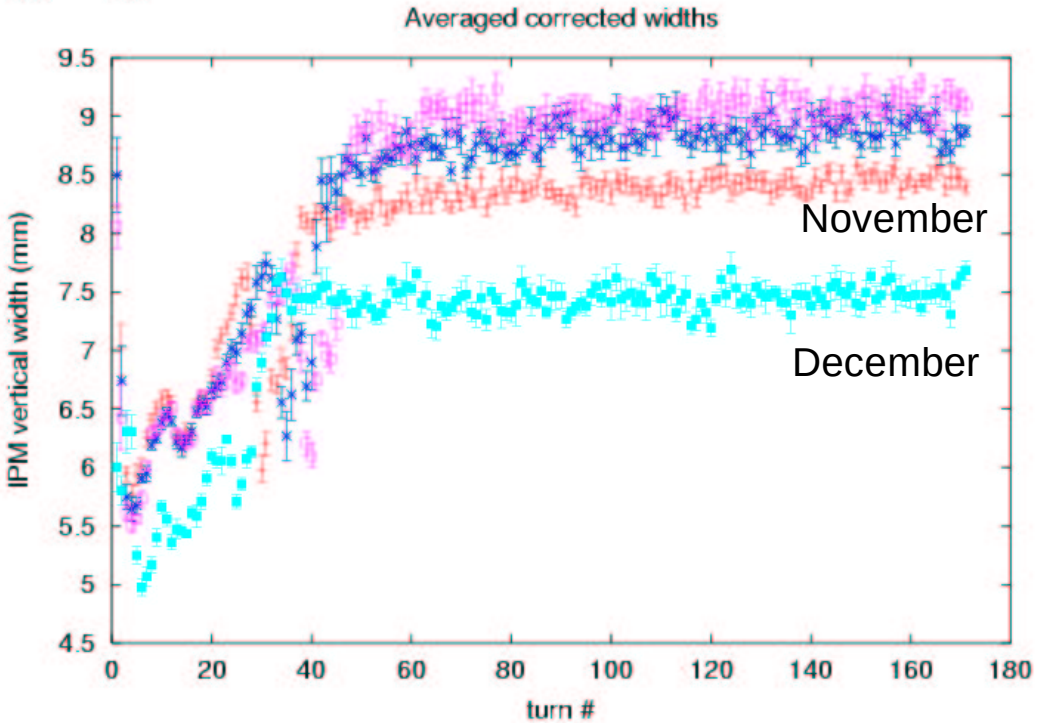
Proposal to calibrate vertical IPM

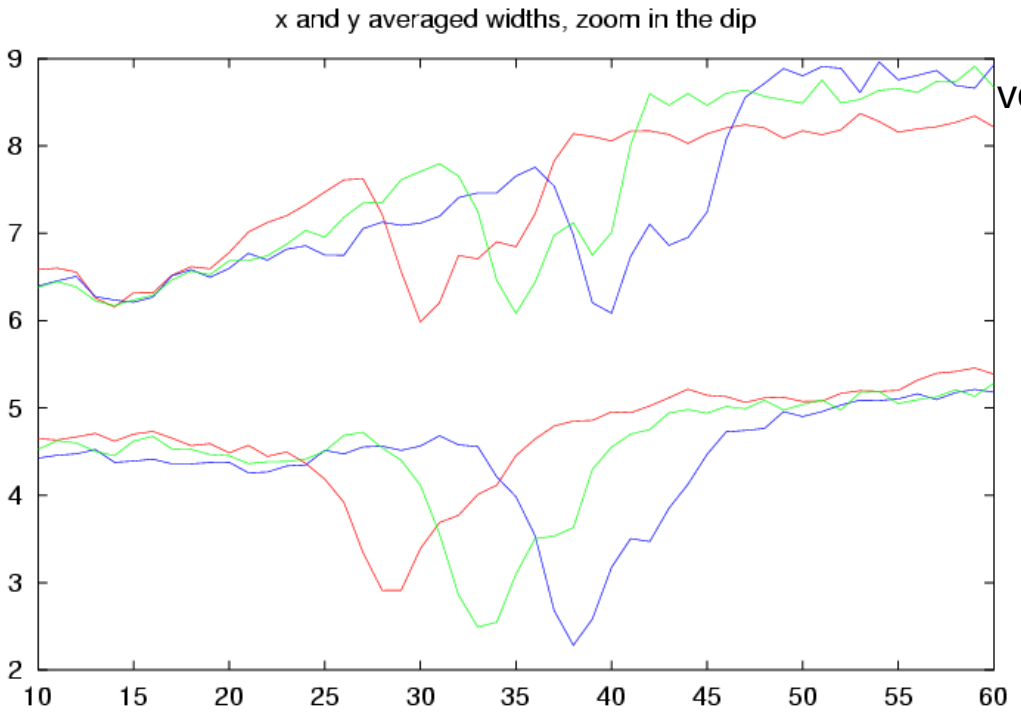


November calibration data.
Flying beam wire is in place
The three data sets have different injection timing with respect to ORBUMP

December calibration data
notice differences at injection

The points shown are the averages of IPM data sets (10-15 per point) taken with the same running conditions. The errors shown are the errors on the mean.





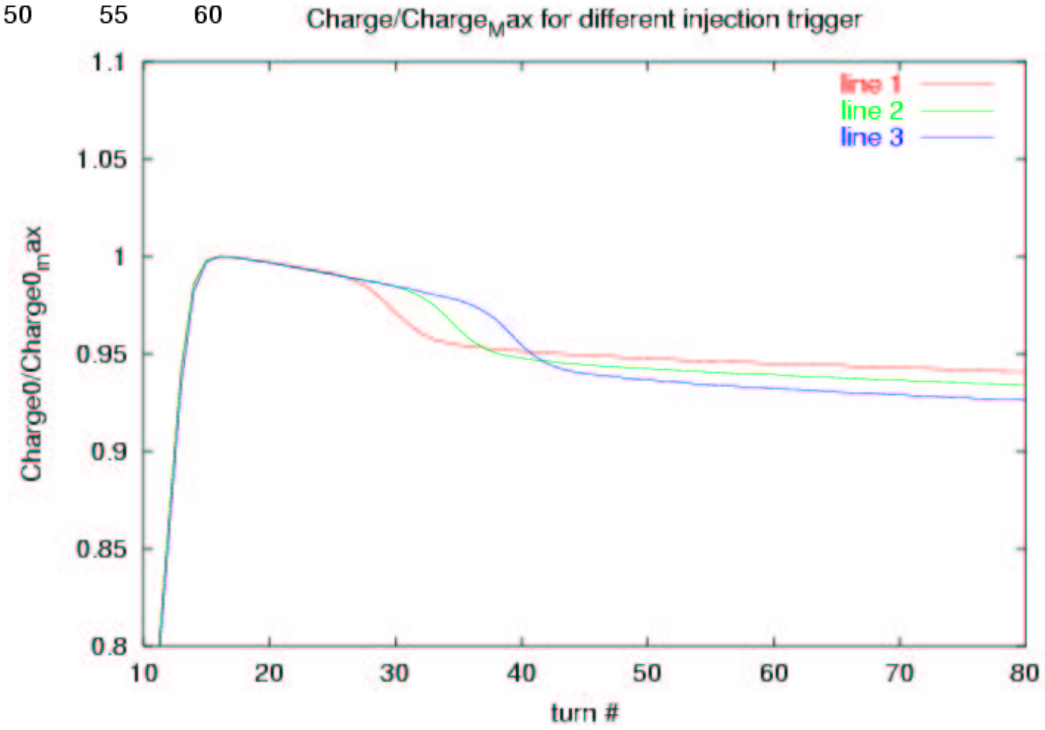
vertical

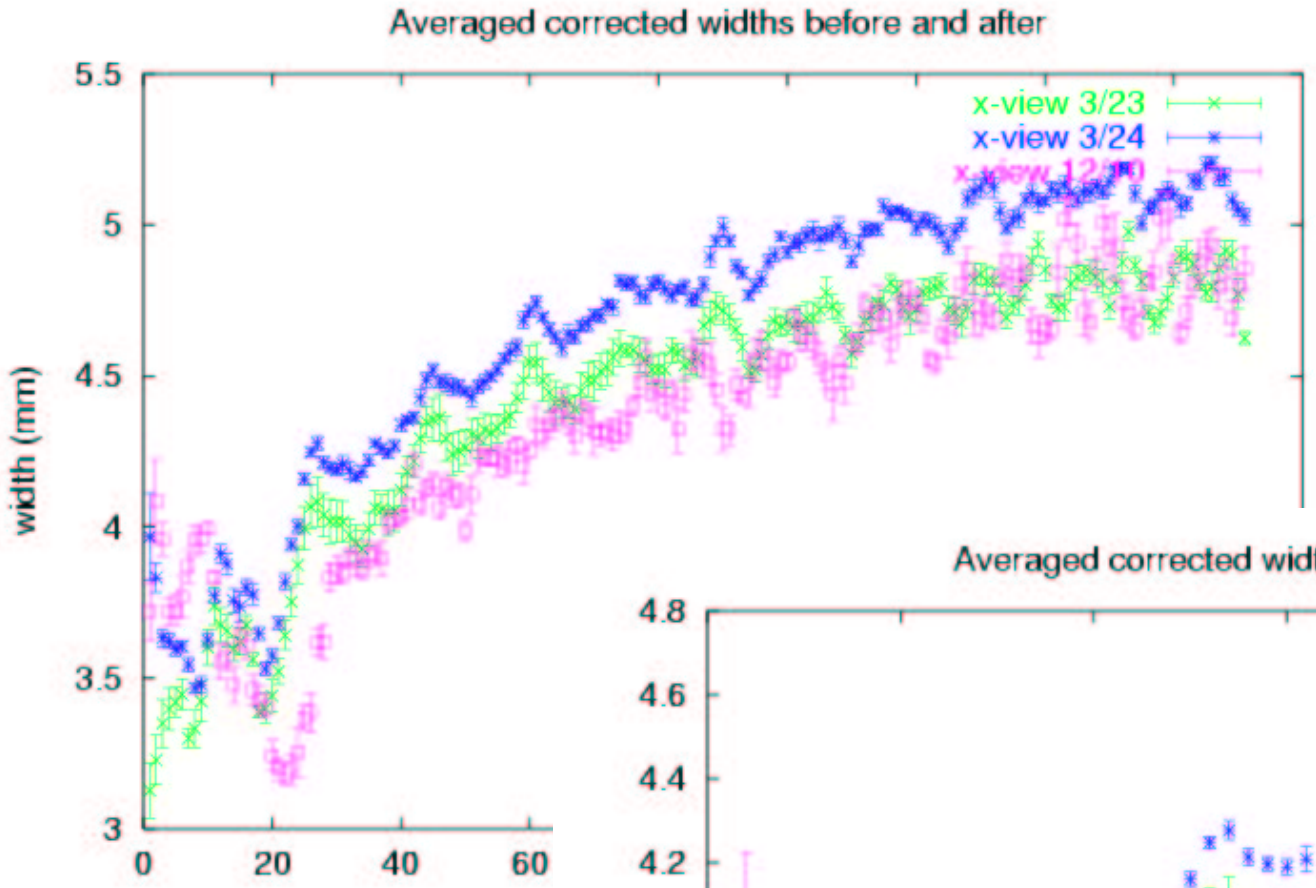
horizontal

November data only zoom in notch region with IPM

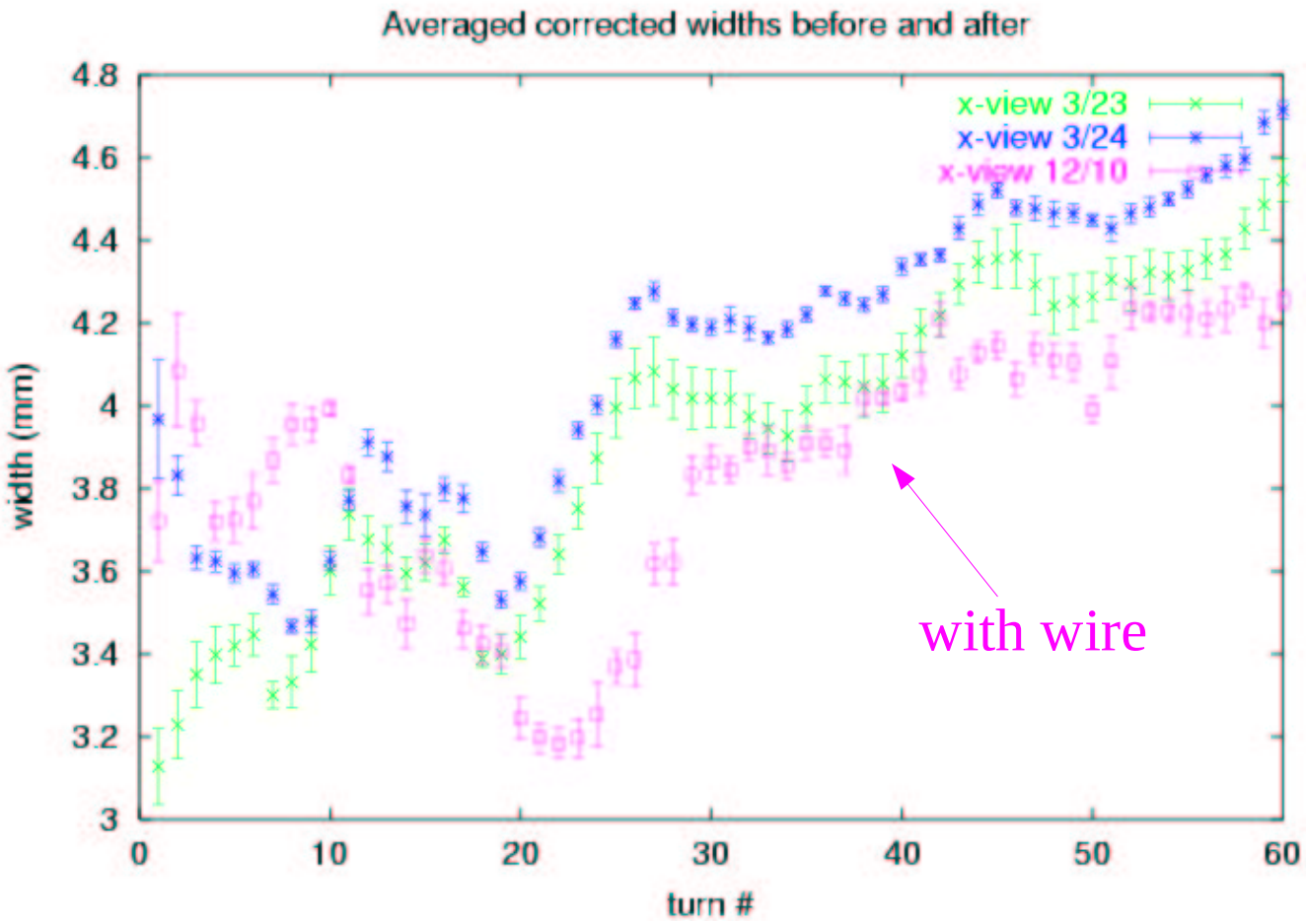
Loss pattern seems to follow “notch”

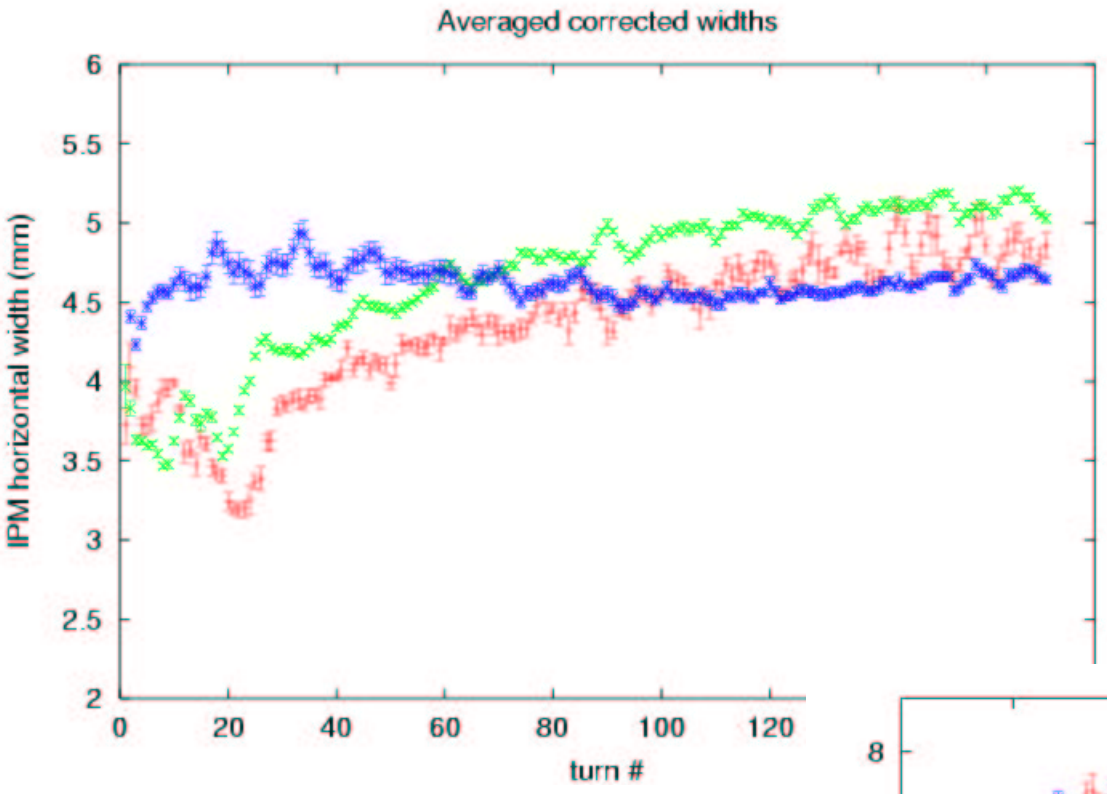
Charge0/Charge0_MAX



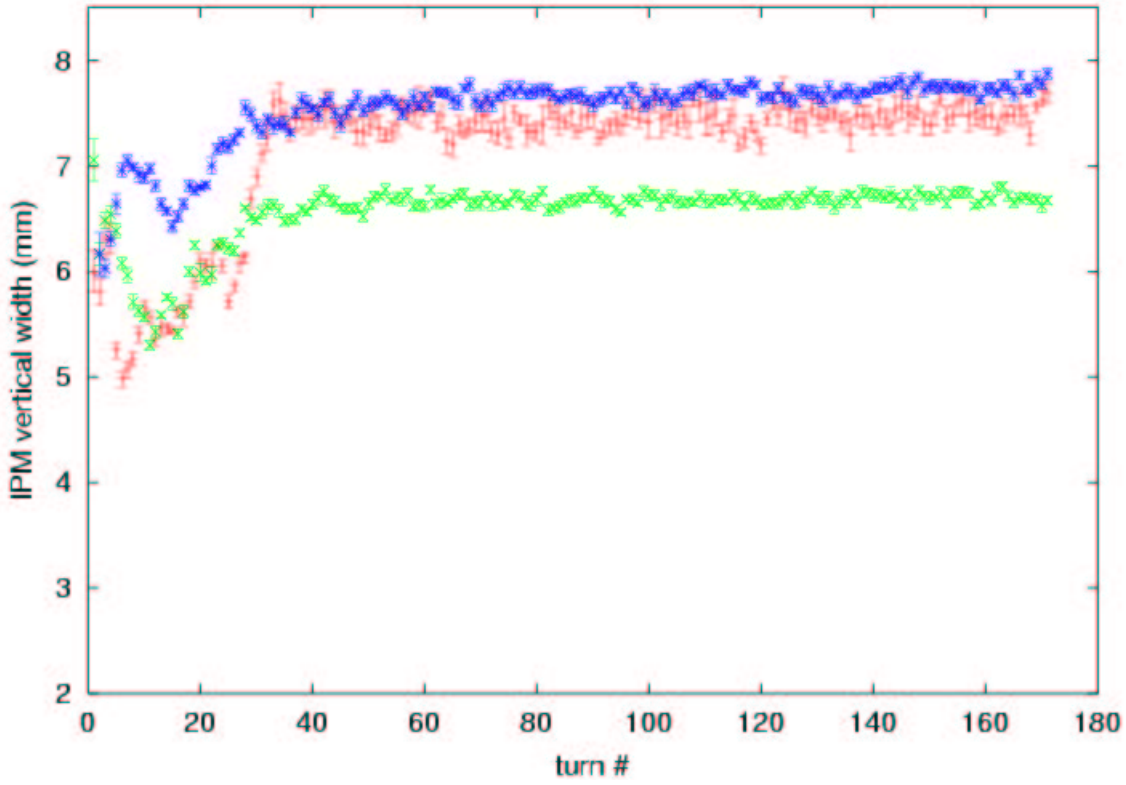


Widths before and after dogleg change
Data sets before change have “flying beam wire present”

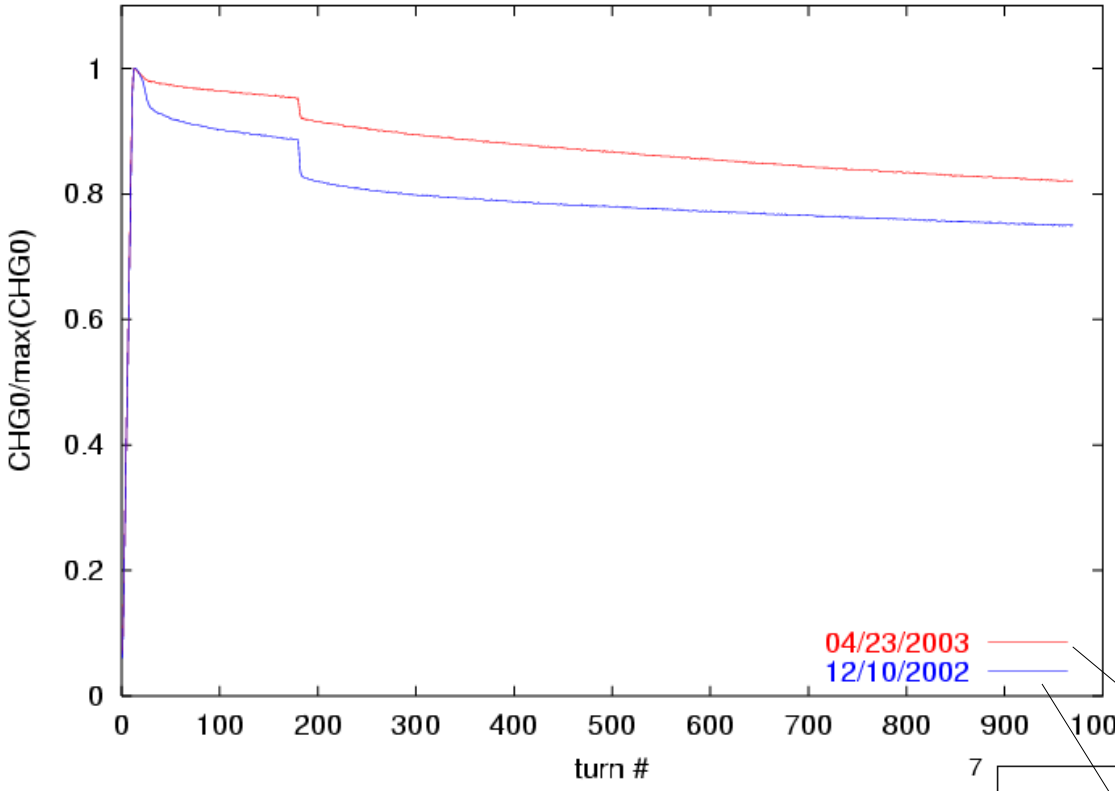


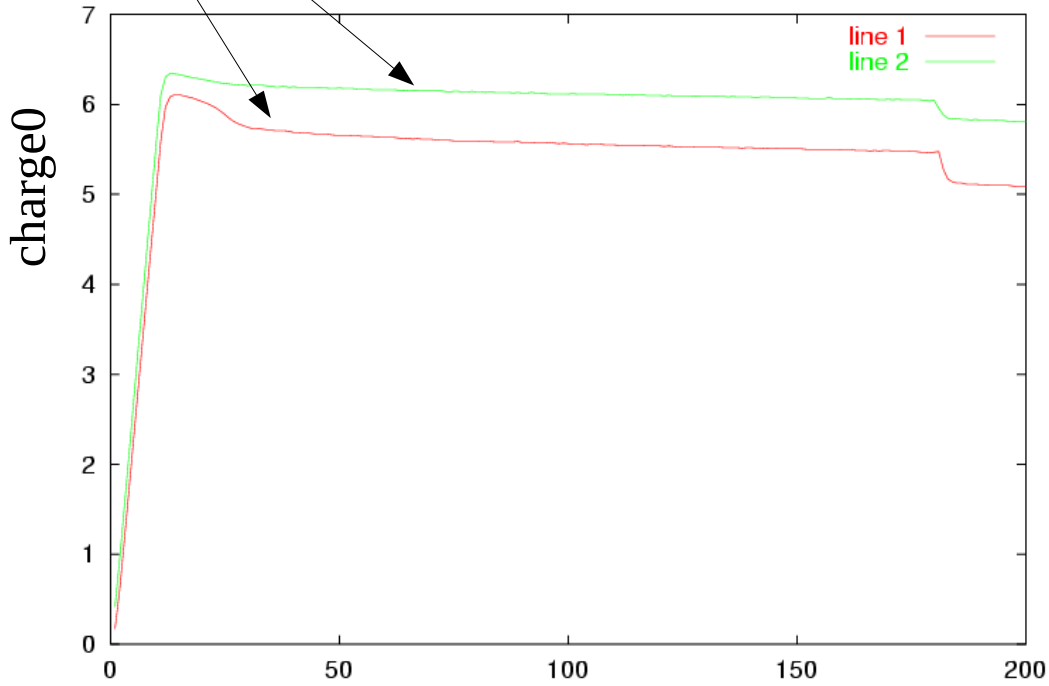


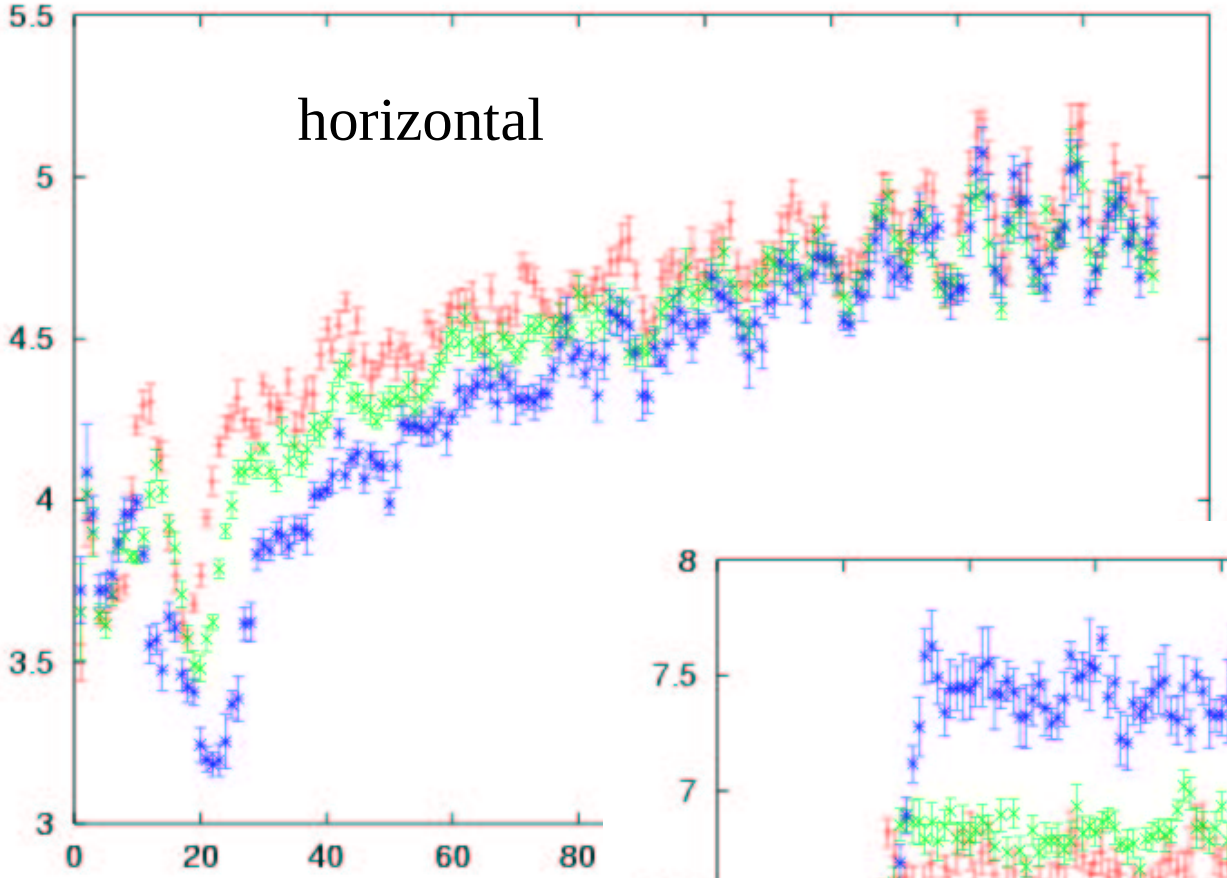
03/25/03 after dogleg
12/10/02 “old” configuration
04/23/03 also ORBUMP shortening



Losses look better!

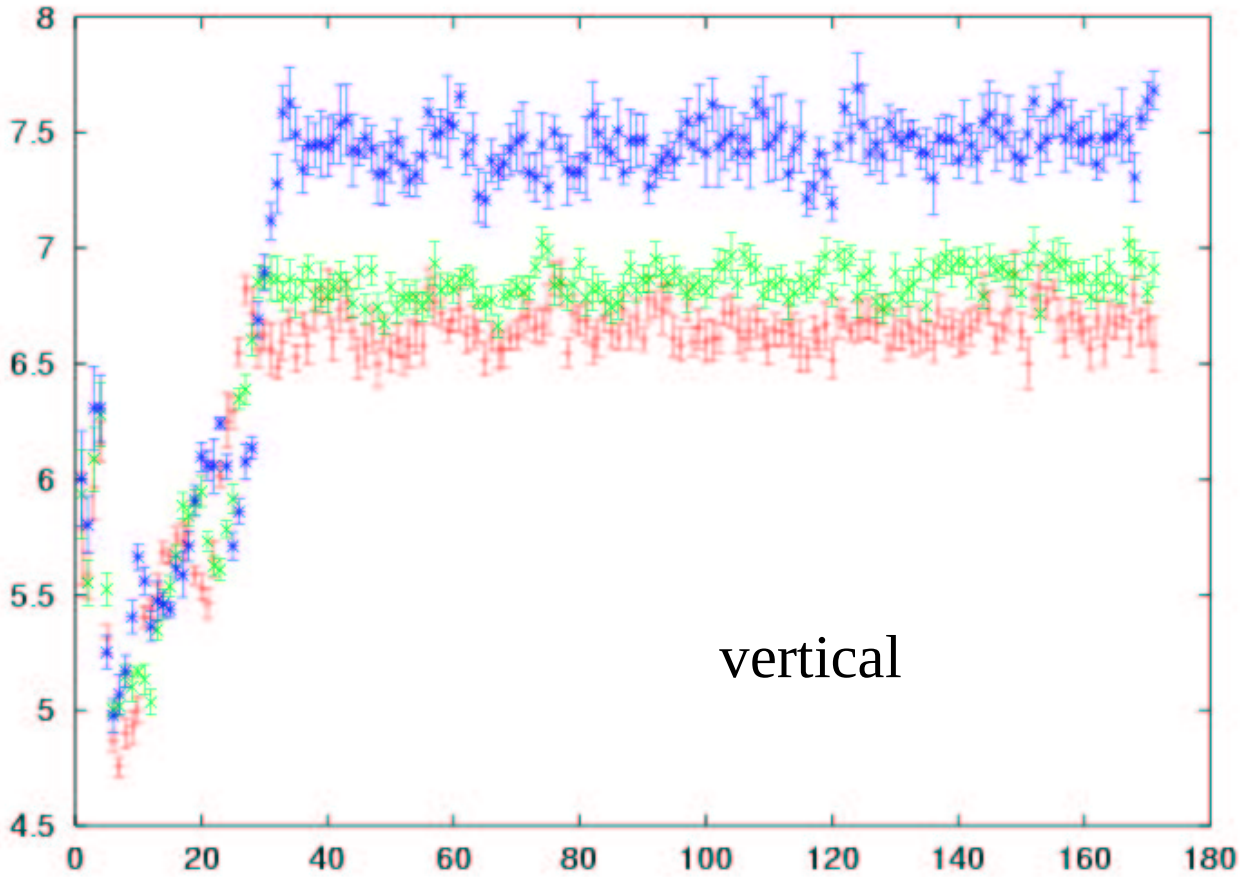


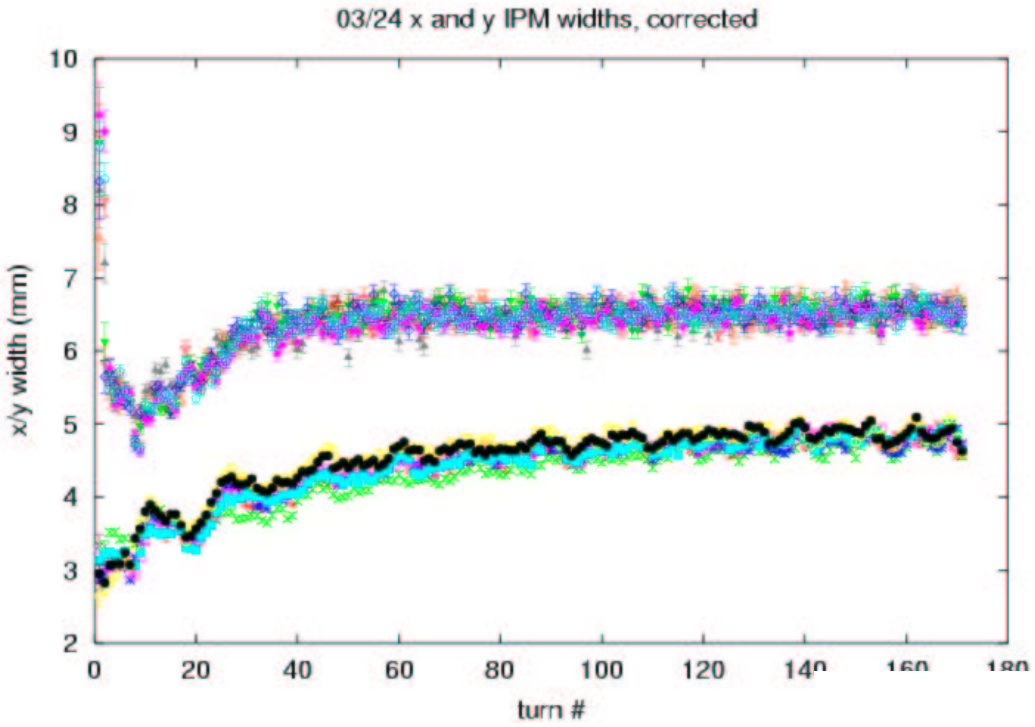


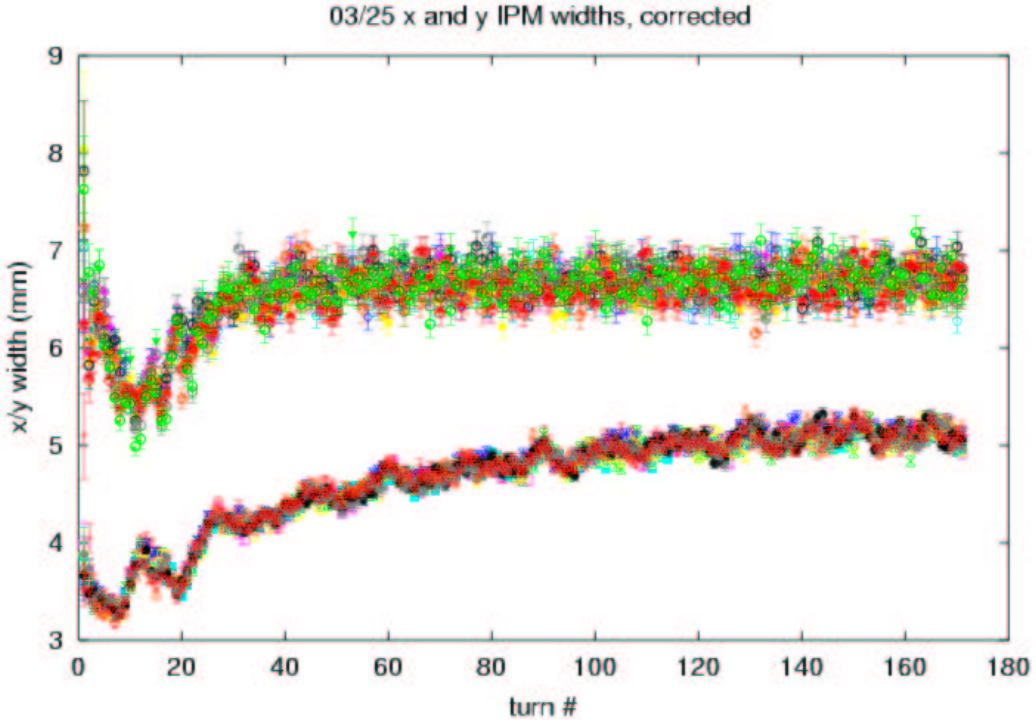


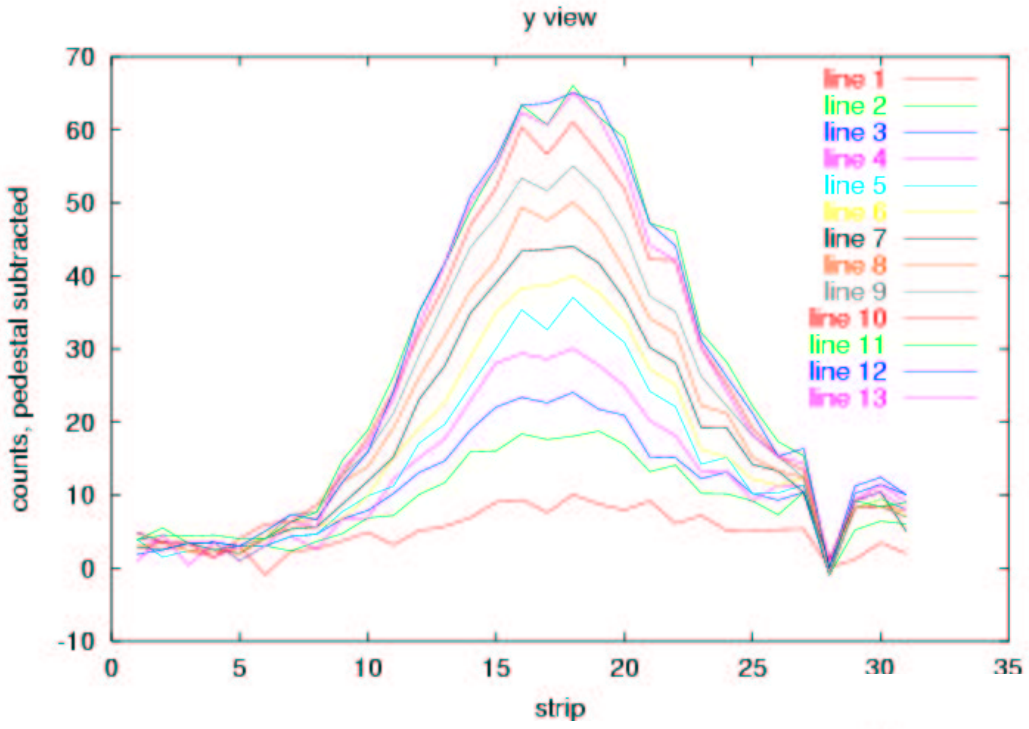
December data

6 turns
8 turns
11 turns



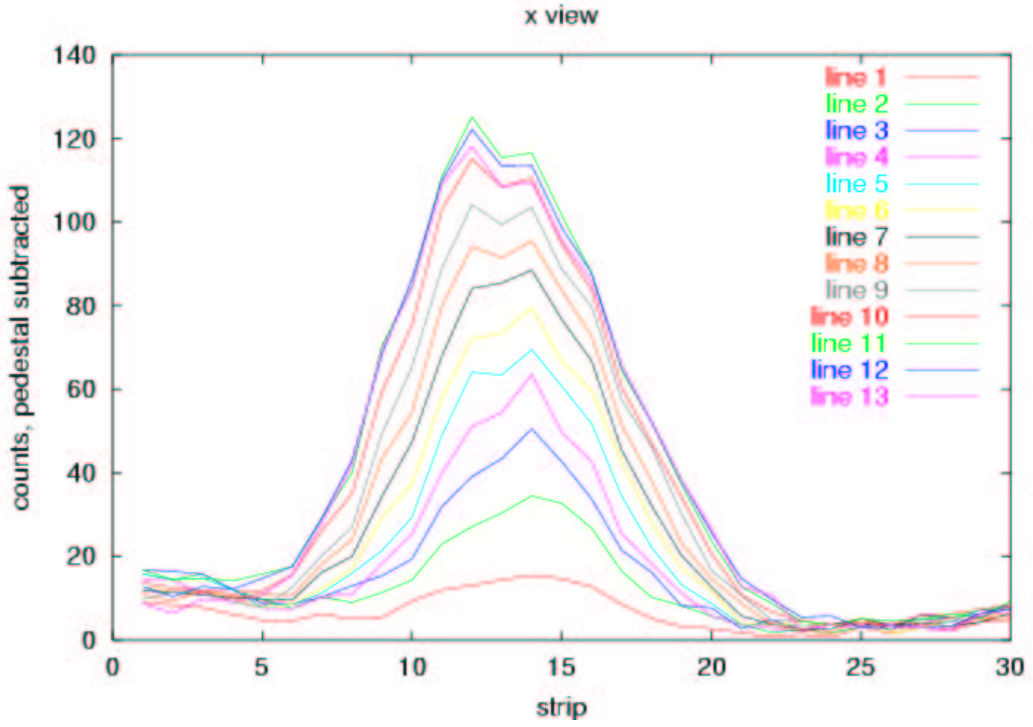

03/24 x and y IPM widths, corrected
x/y width (mm)
turn #
10
9
8
7
6
5
4
3
2
0
20
40
60
80
100
120
140
160
180


03/25 x and y IPM widths, corrected
x/y width (mm)
turn #
9
8
7
6
5
4
3
0
20
40
60
80
100
120
140
160
180



measurement for first turn (s) has larger error (small signal to background)

Another observation: we fit gaussian + bgnd.
The bgnd term is always higher for the first few trurns.



Summary

1) Notch (x & y) seems to be related to ORBUMP transition
2) Beam losses associated with notch
3) Notch characteristics change with dogleg change & ORBUMP pulse change
4) Beam losses best in current configuration
   - ➔ would like to monitor on regular basis

Should calibrate the vertical detector

Would like to take one shift with the vertical IPM rotated the
and the flying beam wire in.