

Shape of the luminous region at DØ

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- New web page: as requested, now there is access to raw data
- Results after optics change and comparison with previous stores for:
 - β^*
 - XY coupling
 - Z_0
- Conclusion

new web page

<http://www-clued0.fnal.gov/~estrada/beamwidth.html>

Beam width analysis status:

results for stores: 2134-3177 [plots](#) , [numbers](#) (ascii files with this [format](#))

results for stores: 3183-3214 [plots](#), [numbers](#) (ascii files with this [format](#))

results for stores: 3219-3228 [plots](#), [numbers](#) (ascii files with this [format](#))

results for stores: 3245-3249 [plots](#), [numbers](#) (ascii files with this [format](#))

results for stores: 3254-3263 [plots](#), [numbers](#) (ascii files with this [format](#))

results for stores: 3271-3291 [plots](#), [numbers](#) (ascii files with this [format](#))

results for stores: 3328-3335 [plots](#), [numbers](#) (ascii files with this [format](#))

results for stores: 3487-3491 [plots](#), [numbers](#) (ascii files with this [format](#))

results summary: [plots](#), [numbers](#) ([summary plots after 2003 shutdown](#))

NEW

For questions contact Juan Estrada (estrada@fnal.gov) or Avdhesh Chandra (avdhesh@fnal.gov).

Results after optics change

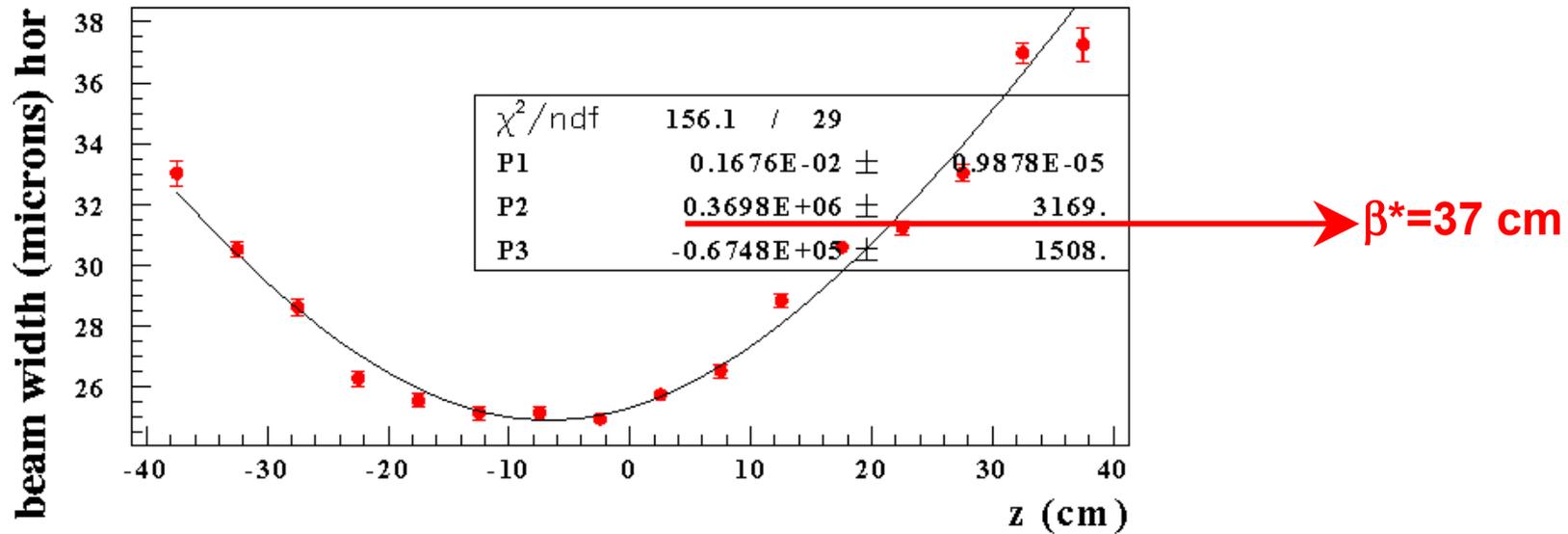
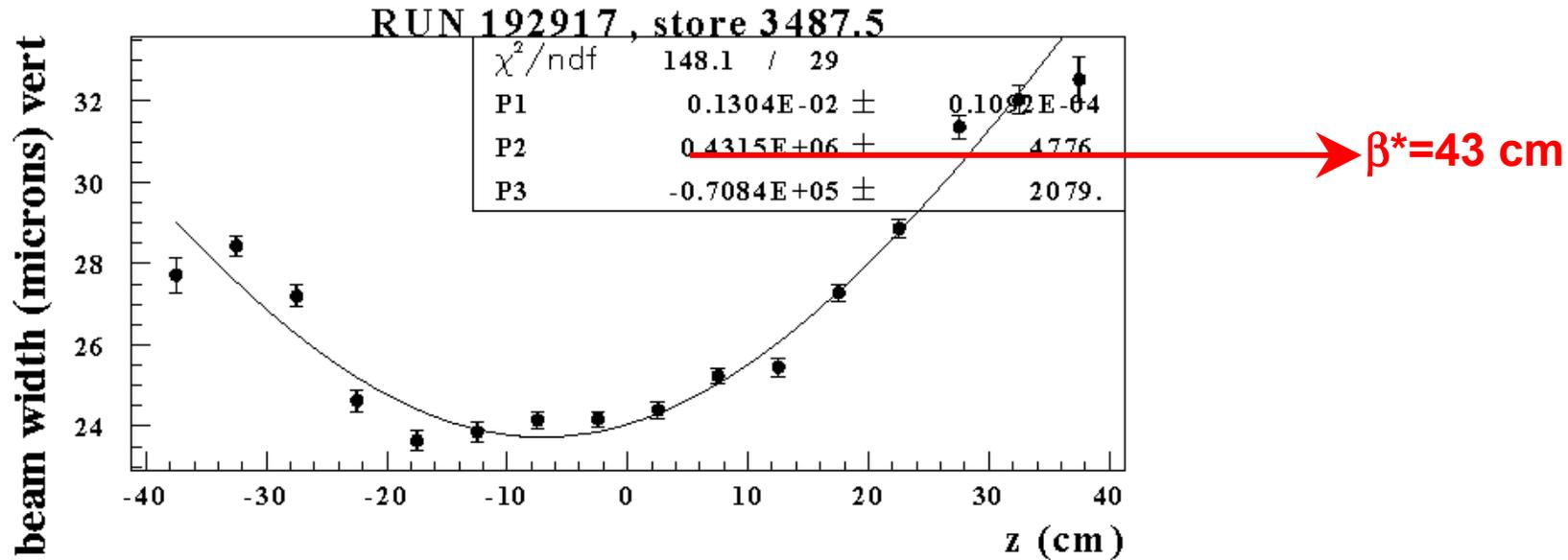
We have analyzed 4 runs during stores:

- 3487 (Wed May 12 18:05 - Thu May 13 08:03)
- 3491 (Thu May 13 22:05 - Sat May 15 07:58)

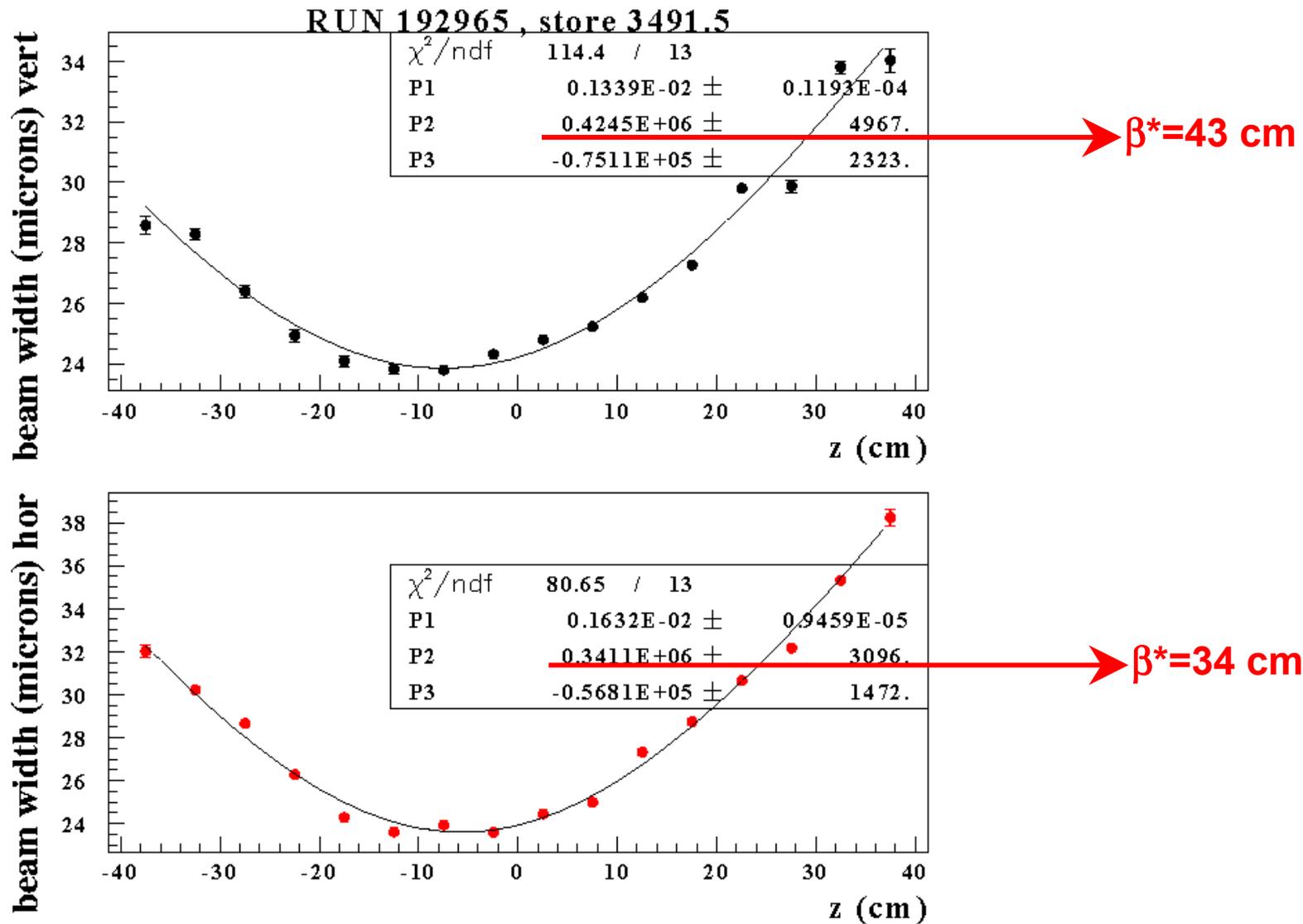
more results are on the way...

We need have about a week to process the data. For some cases (like we did after the optics modification) we can change the priority in the reconstruction of a run, and get the results in 3-4 days.

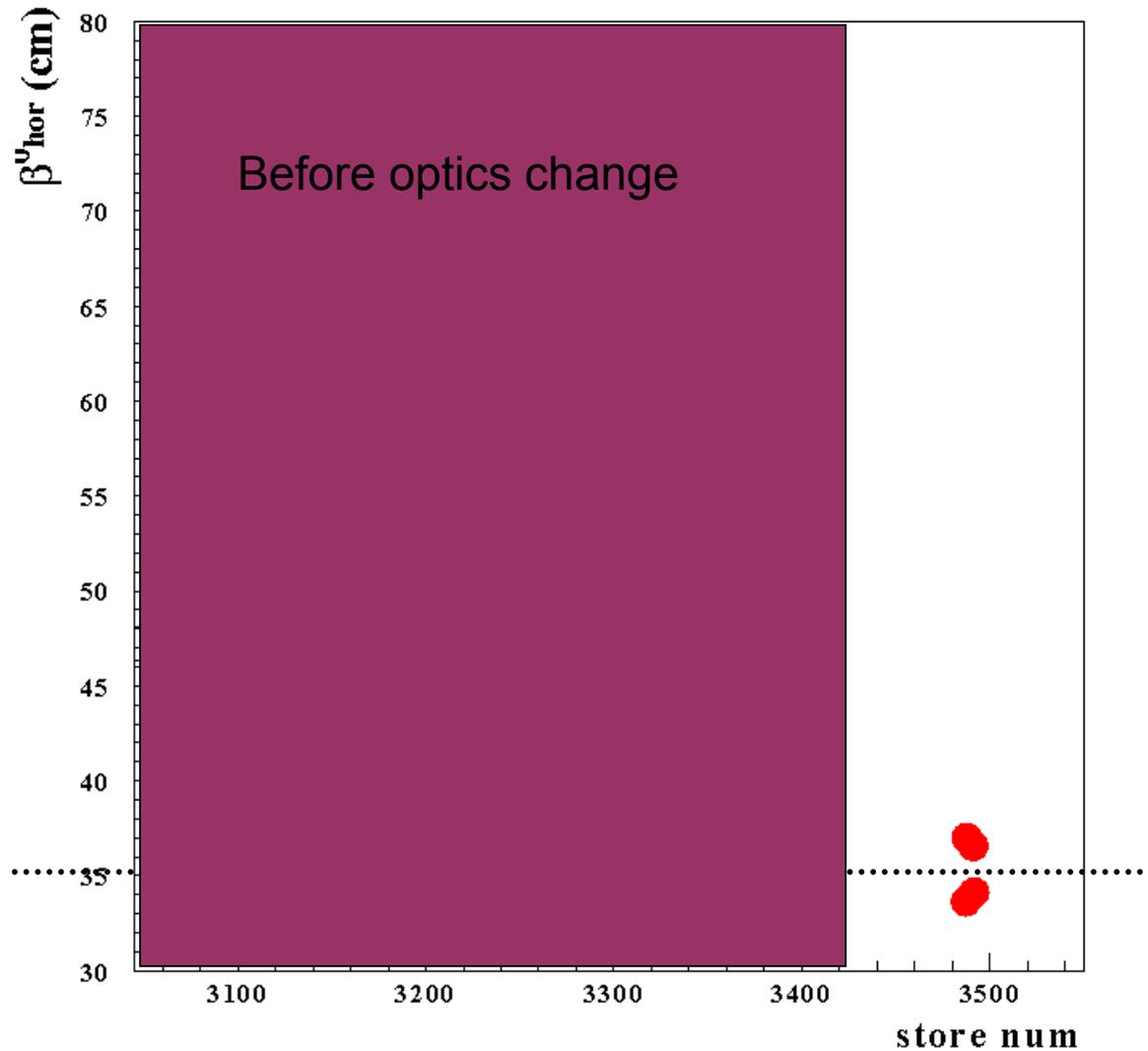
Run 192917, store 3487



Run 192965, store 3491



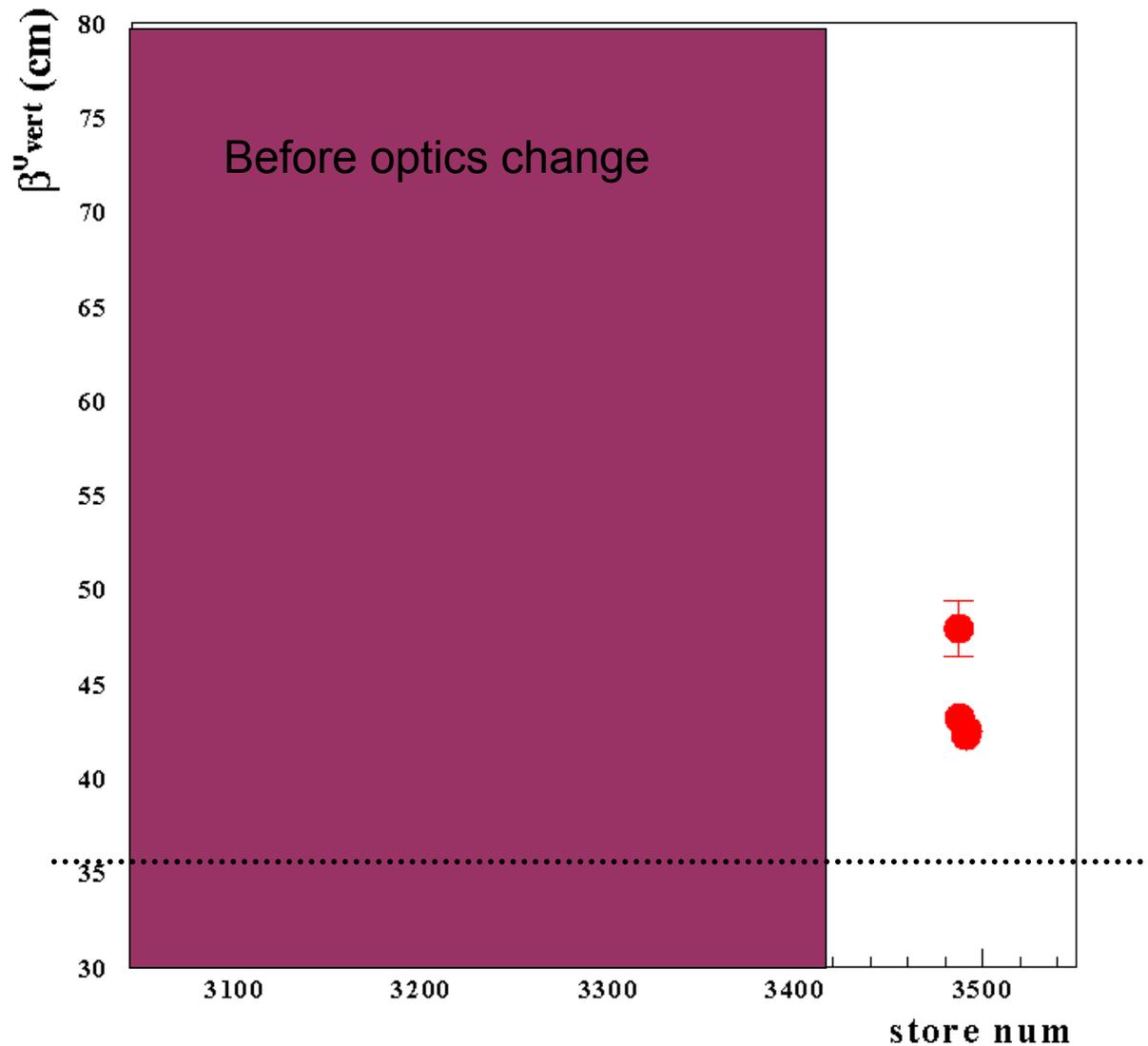
Comparing with previous results



The horizontal β^* is now at the design level of 35 cm.

showing only data after 2003 long shutdown

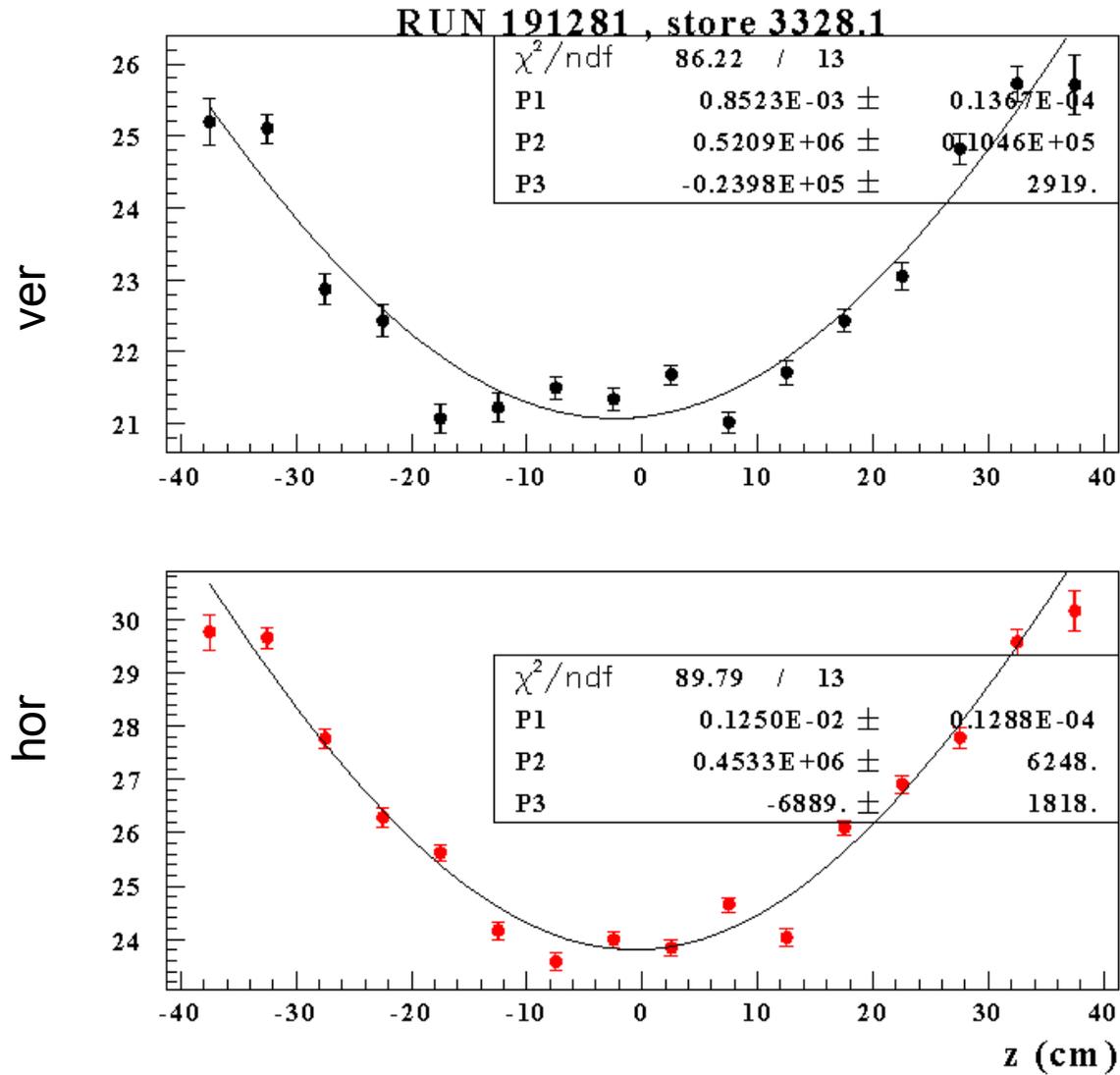
Comparing with previous results



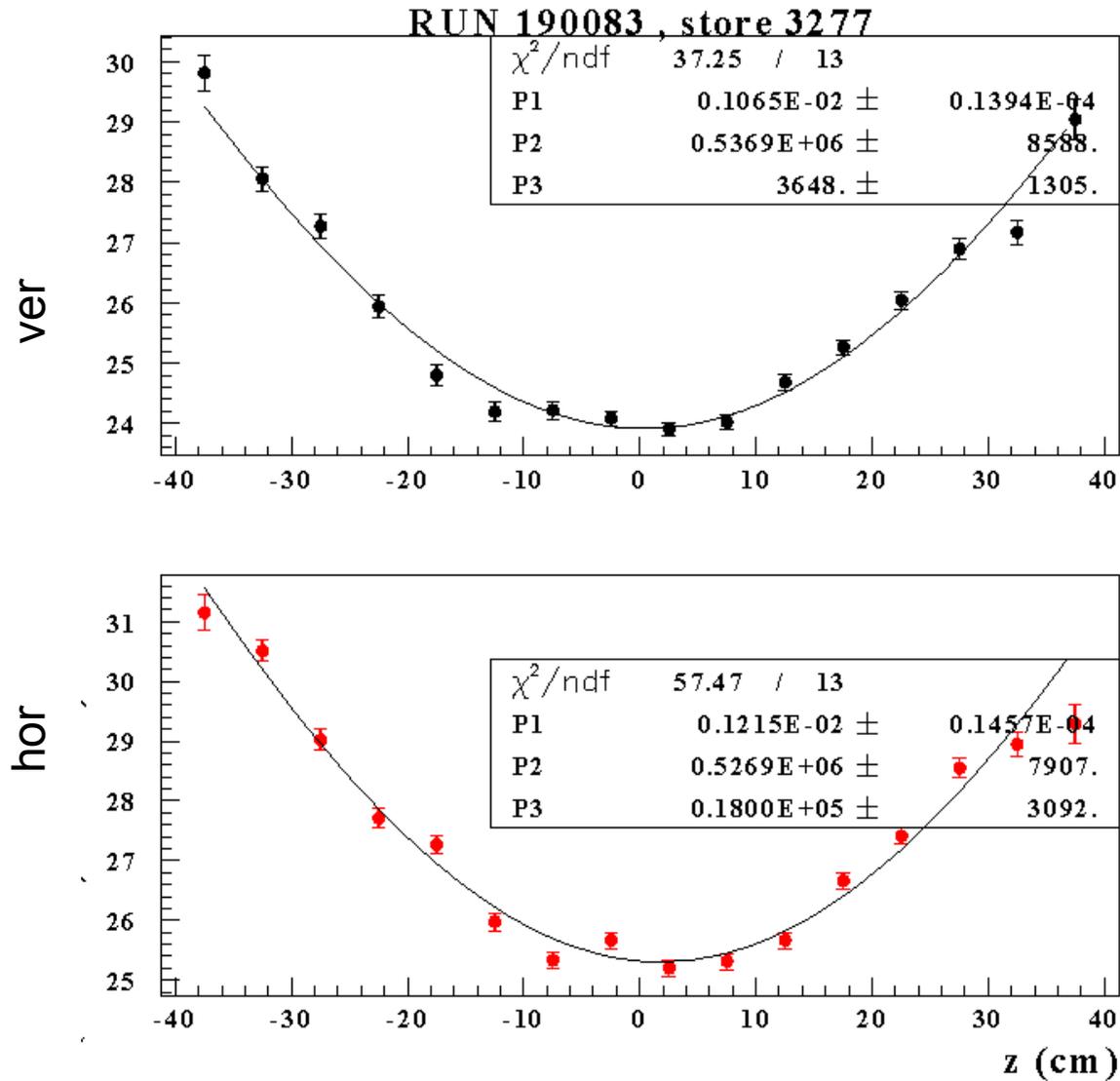
A significant decrease was also seen in the vertical β^* .

showing only data after 2003 long shutdown

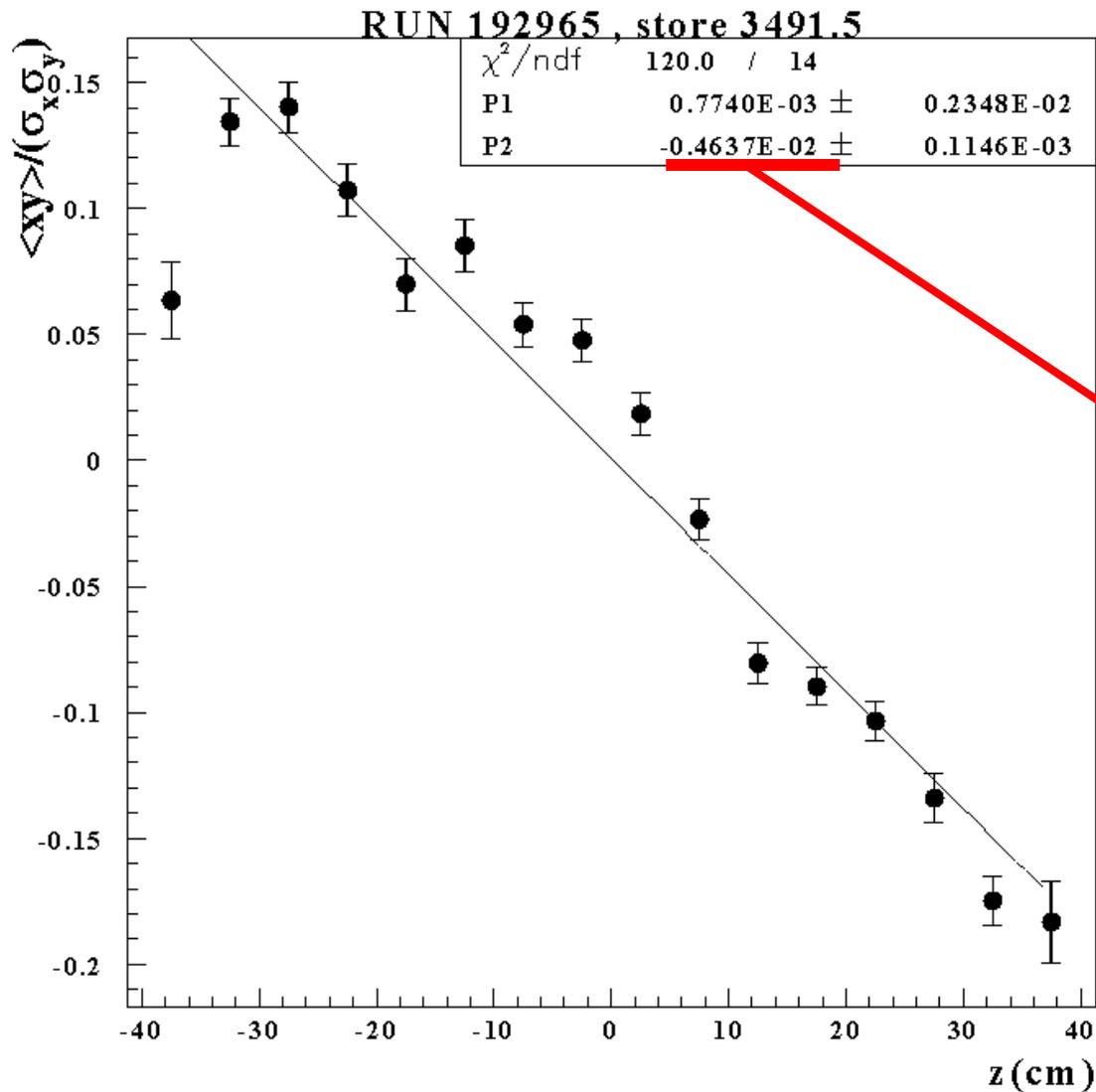
Example before the change optics (1)



Example before the change optics (2)

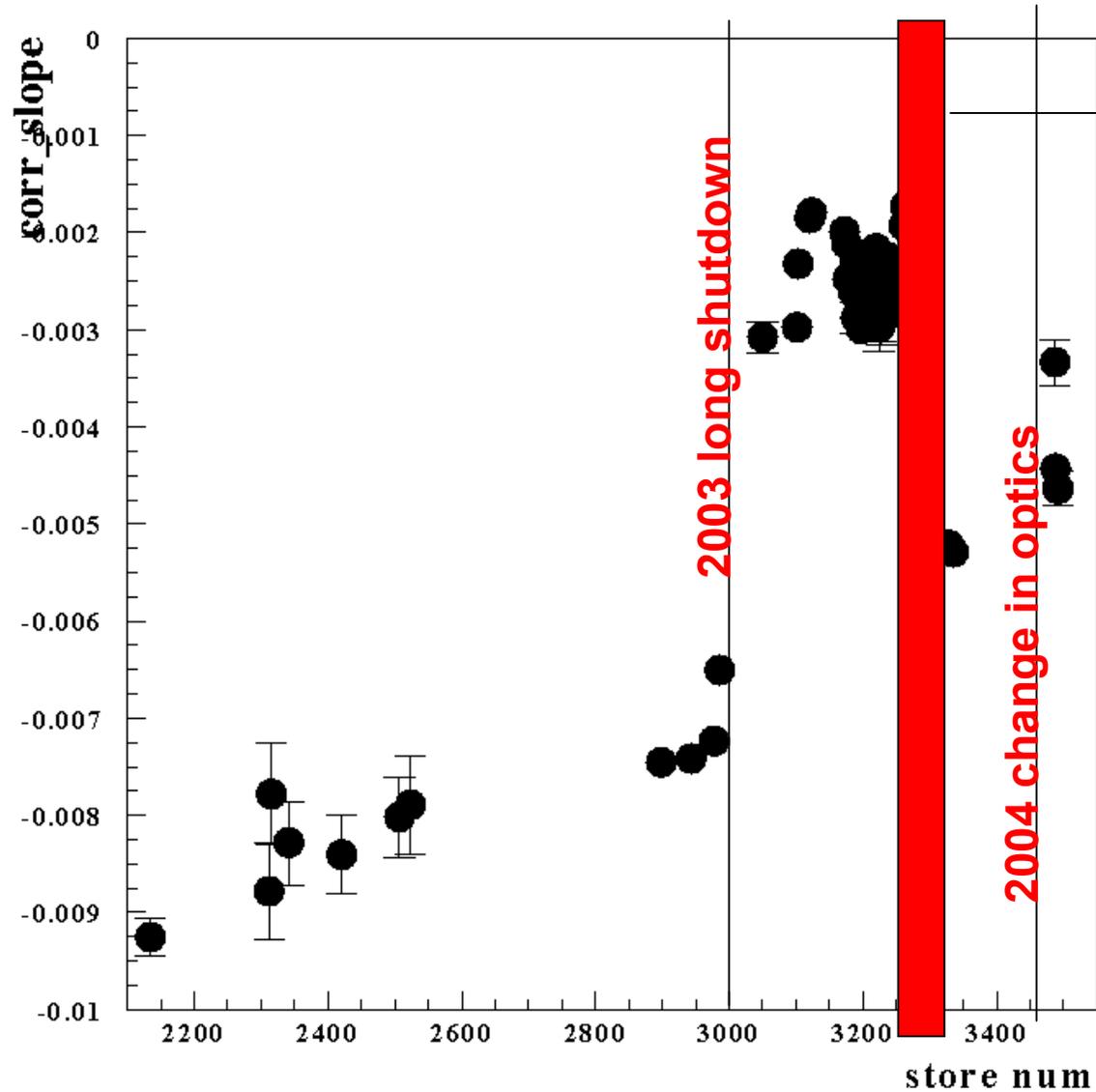


Other changes: XY coupling



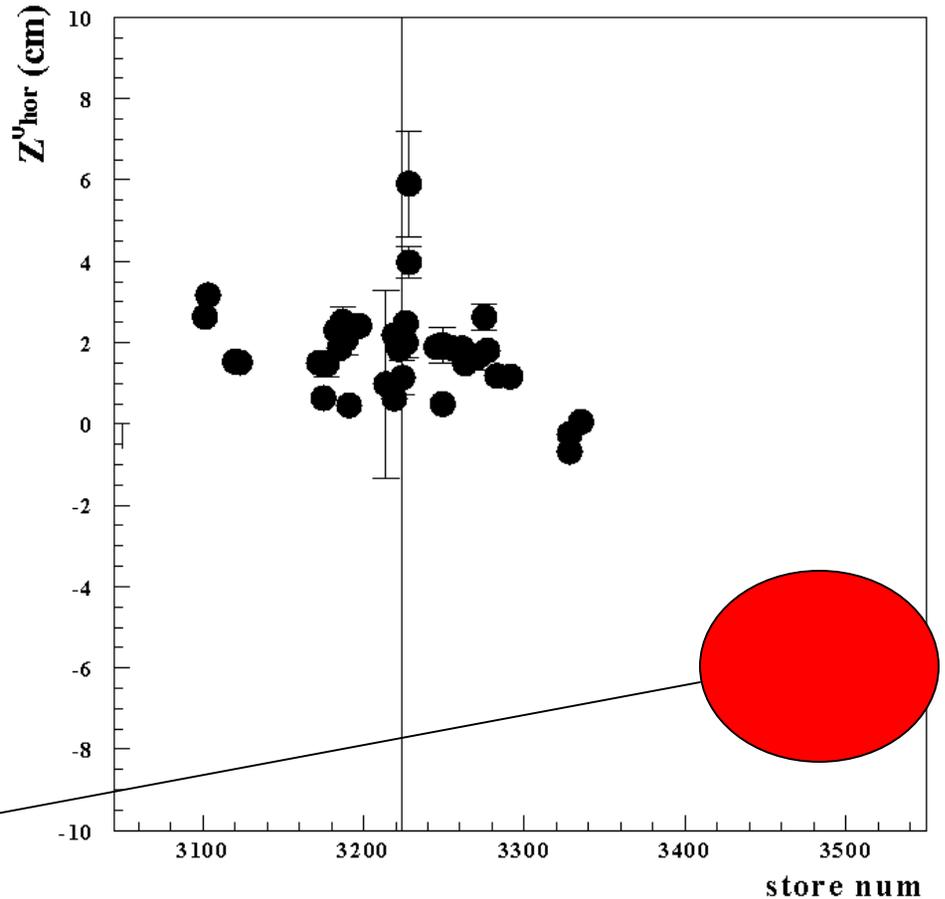
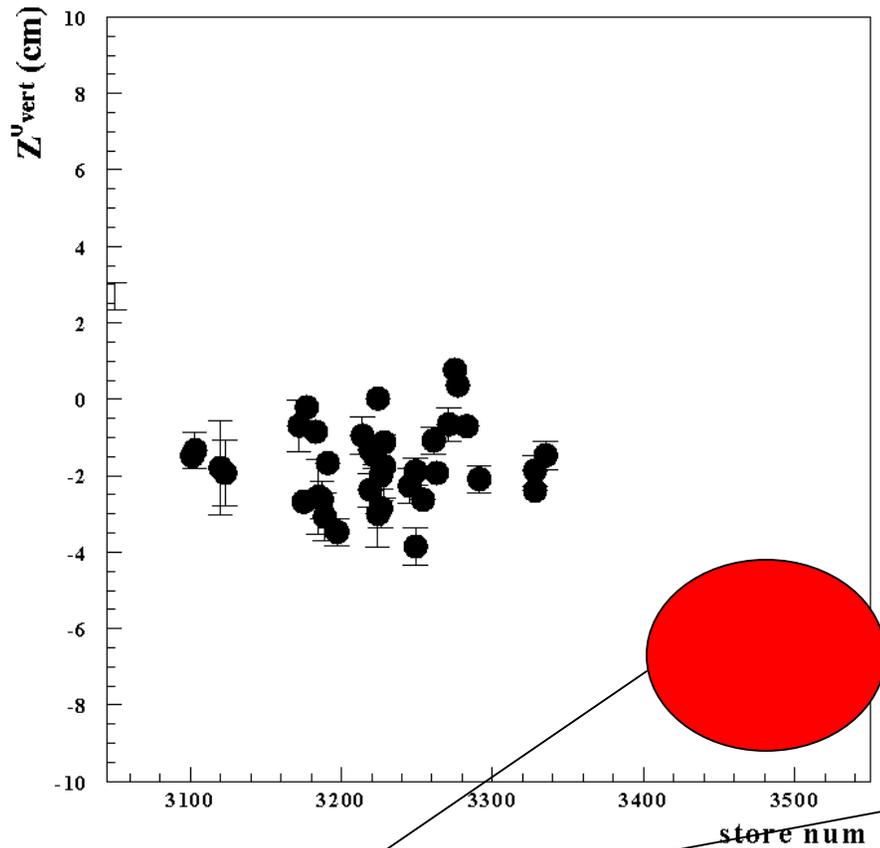
For each run we analyze, we also look at the XY coupling. I will characterize this by the slope we see.

History of coupling



Something happened here that increased the coupling significantly.

Z₀ measurements



Observable shift of about 4-6 cm in $-Z$. (Z axis goes like protons)

A shift is also seen in the Z distribution of PV (smaller).

showing only data after 2003 long shutdown

Conclusion

- After the optics change we see a clear reduction in β^*
- In the for stores we analyzed, we did not see the double waist structure that we were getting before. More data will be analyzed to see if it really disappeared.
- XY coupling did not change much with respect to recent stores, but is somewhat larger than what we got right after the 2003 shutdown.
- shift in Z_0 of about -5 cm with the new optics.
- As requested, you have now access to the raw from the web page.
- The fits still have very large χ^2 , which indicates that the shape of the luminous region is not as we expect. We are doing some alignment studies in the detector...

Thank Avdhesh Chandra (Tata Institute) for all his hard work getting these results.