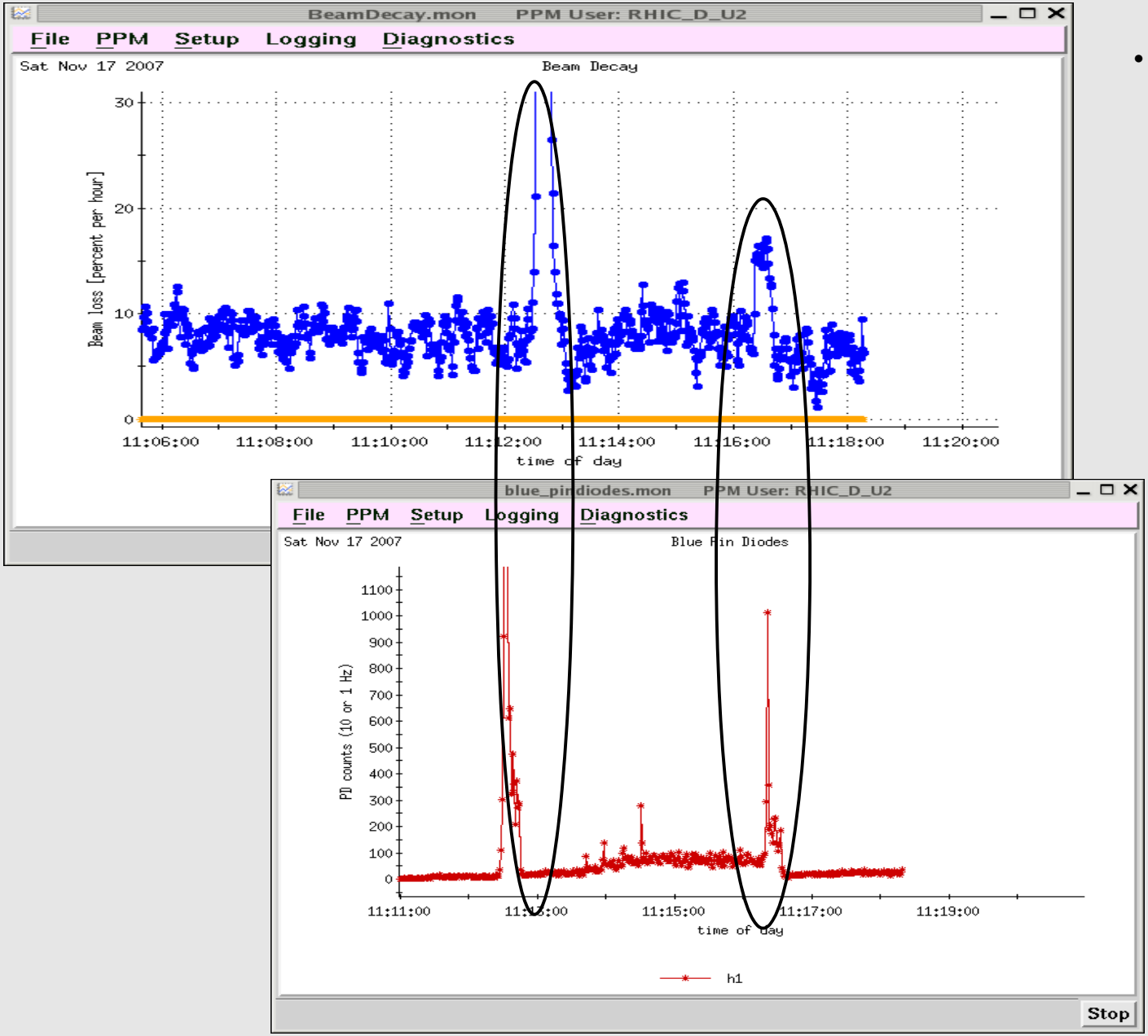
Collimation Before Store

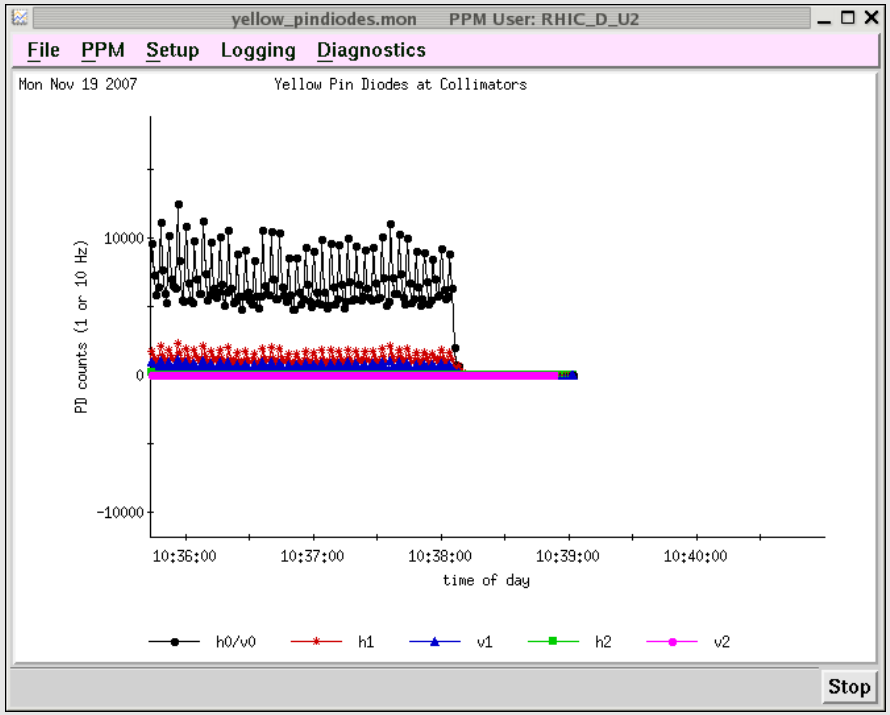
- several attempts at Injection
  - explore halo at injection
  - examine background conditions at store/collisions
- Ramp
  - try to move collimators in at the end of the ramp
  - examine background conditions at store/collisions

d-Collimation at Injection (Nov 2007)



- As soon as the PD signal (bottom) spikes, the losses show up in the beam decay as well, indicating that this is already the outpost of the gaussian beam. As a first conclusion this would indicate that there's very little halo present at injection outside the gauss-core of the beam (deuterons).

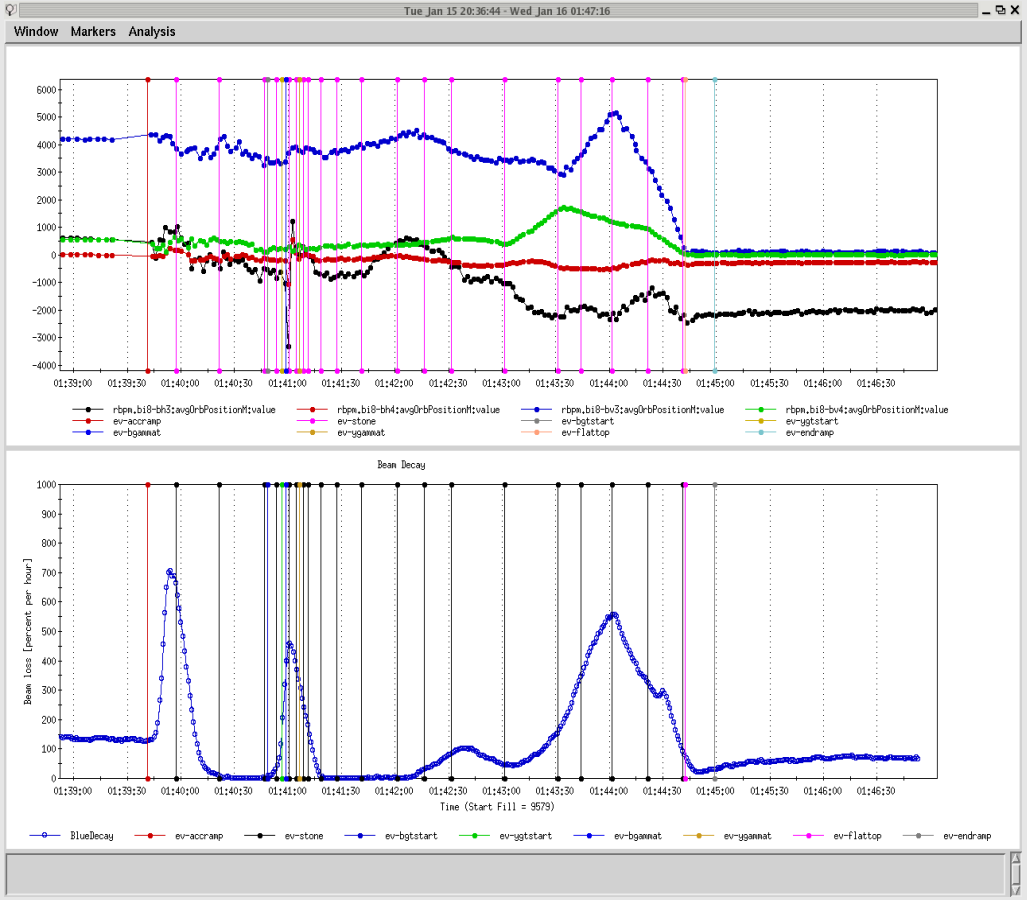
Au beam collimation at injection (Nov 19 2007)



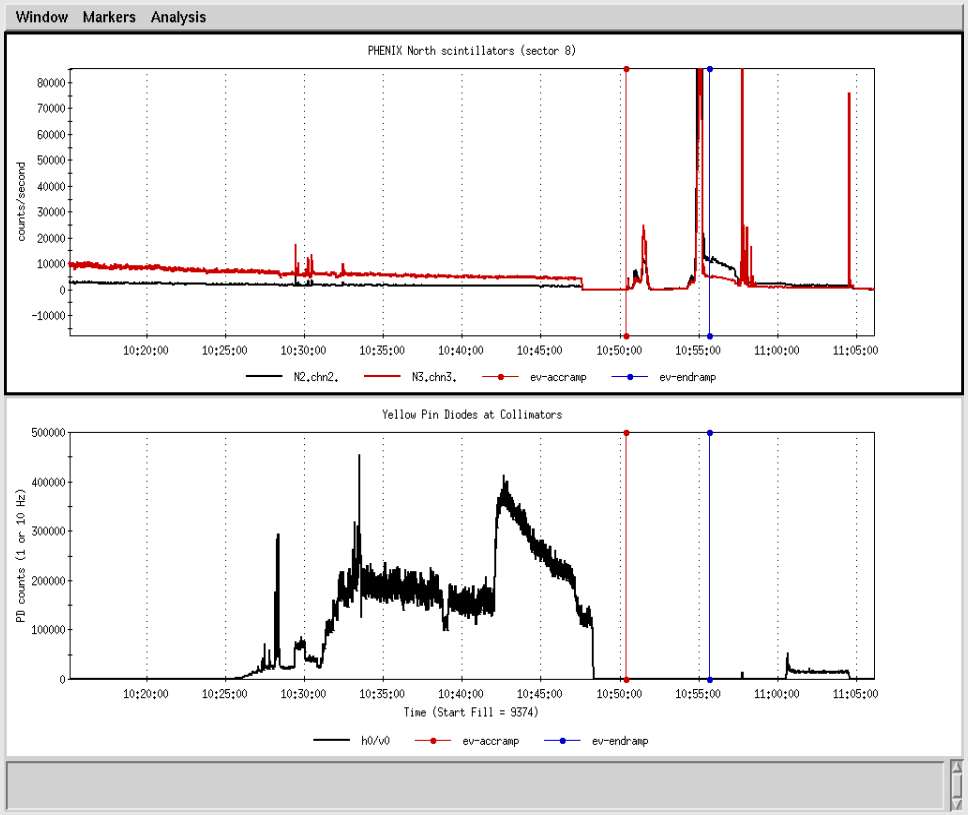
- Yellow situation is different, local losses at collimators (PinDiodes) drop when collimators are pulled out, no changes in beam-decay: some halo present in Au.
- does this reflect in experimental backgrounds?

1st attempt Jan 16 2008 (9579, blue)

- UpColl.tape created
  - collimators are moved in 120 sec after AccRamp.
  - store setting – 0.1 sigma
  - ramp efficiencies:
    - 87 %
    - 83 %
  - beam decay coincides with vertical 'swing' in blue collimator area

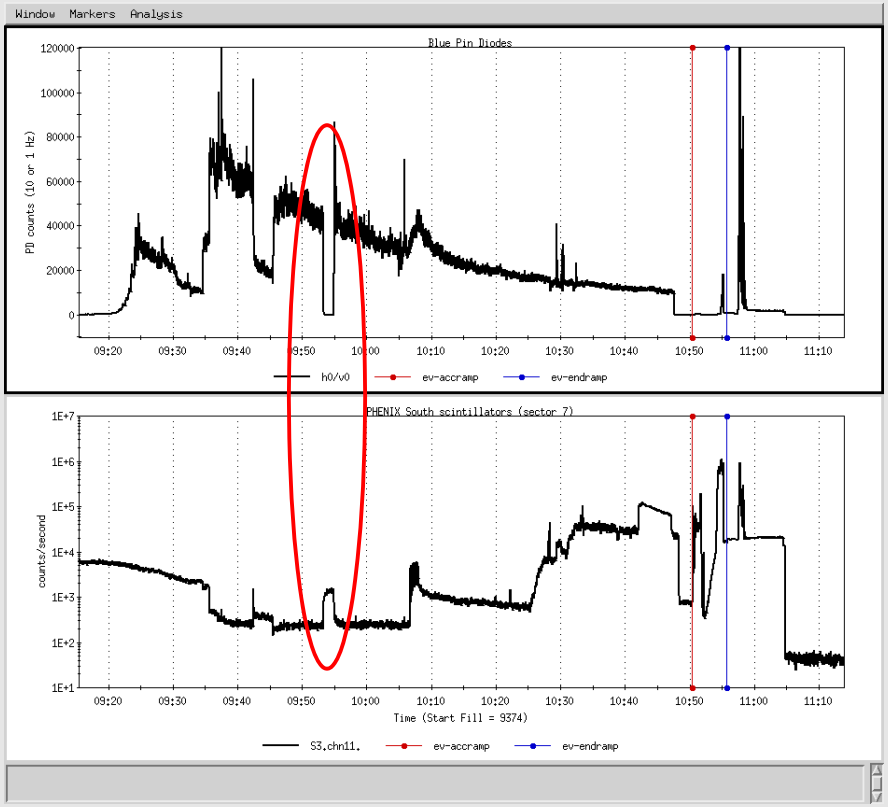


Yel Background signals at Injection (9374)



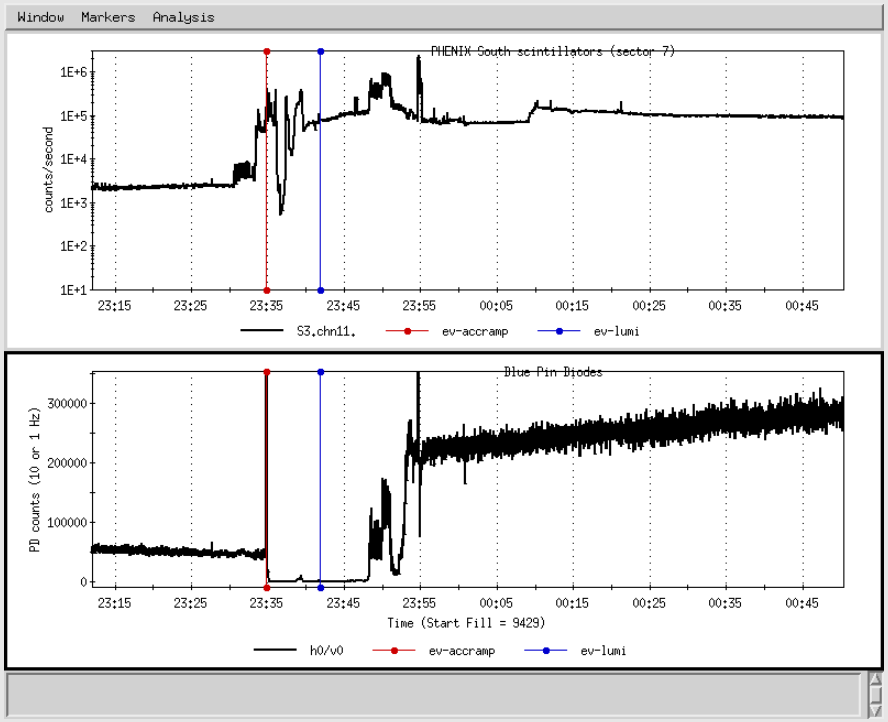
- There was no reduction in the N3 and N2 signal (top) achieved due to collimating yellow at injection (PD signal, bottom). Note that the intensity was rather low (78 bunches) and the conclusion, that there's almost no halo at injection, might not hold with higher intensities.

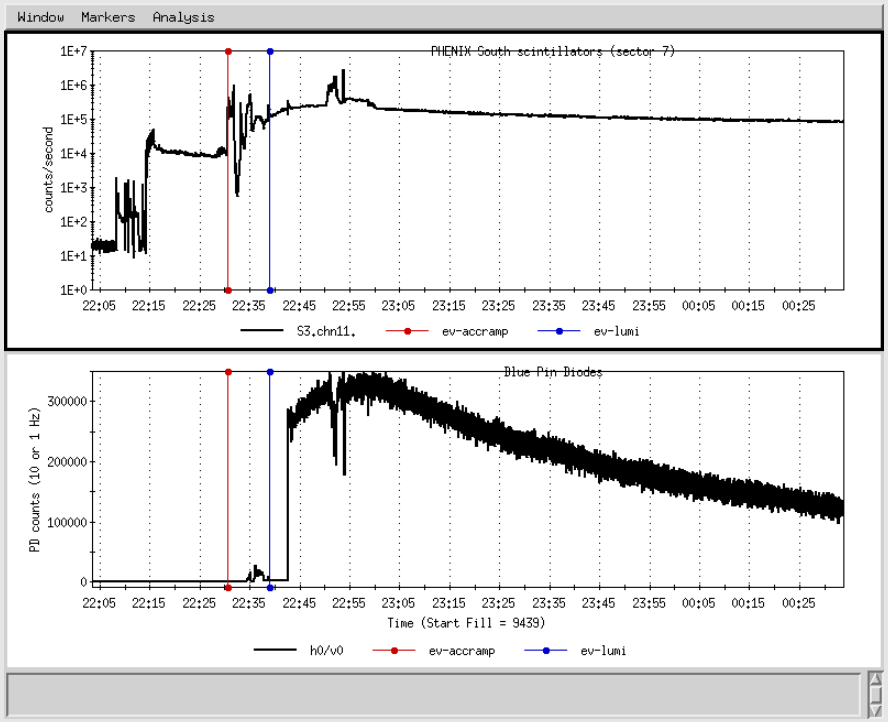
Blue Background signals at injection



- PD signal (top)
- PHENIX blue background signal S3 (bottom)
- there is some reduction at injection with **78 bunches** filled (there was none with 6 bunches)

Blue: compare with and w/o collimation at injection

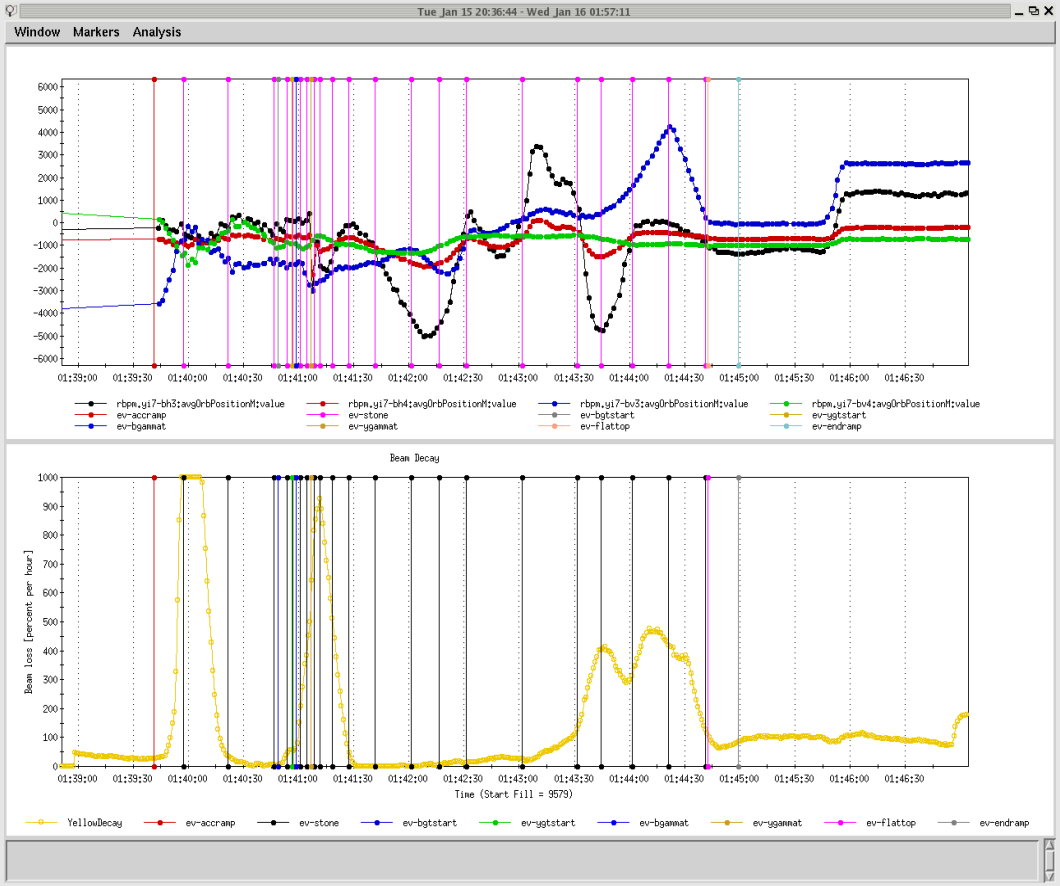




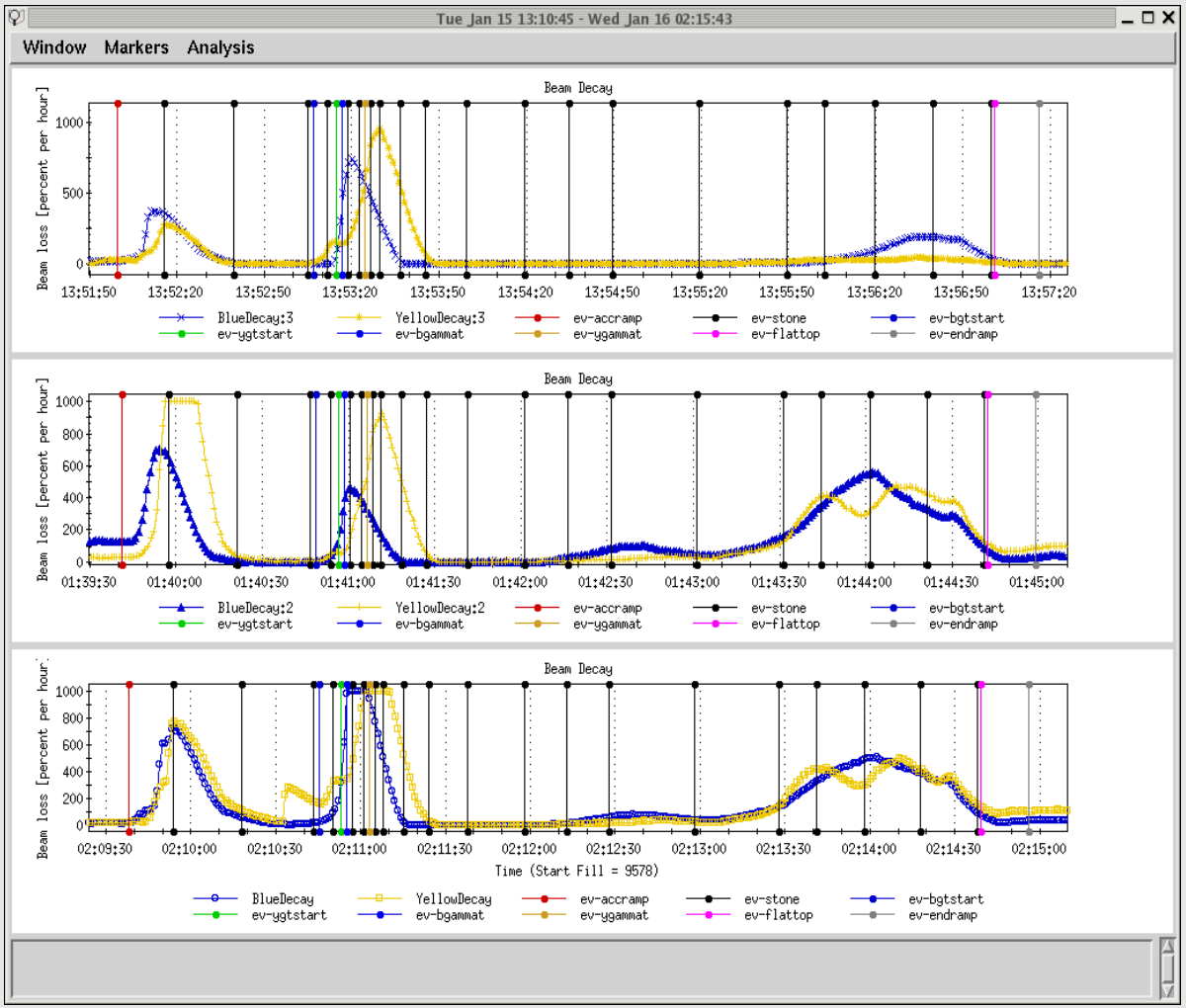
left: 9429, d collimation at injection, 65e11
right: 9439, standard filling procedure, 70e11
=> no change in IR8 background signal

Ramp: 1st attempt (yellow)

- beam decay coincides with horizontal orbit excursion (1st peak)
- 2nd peak unrelated to collimator position (?)

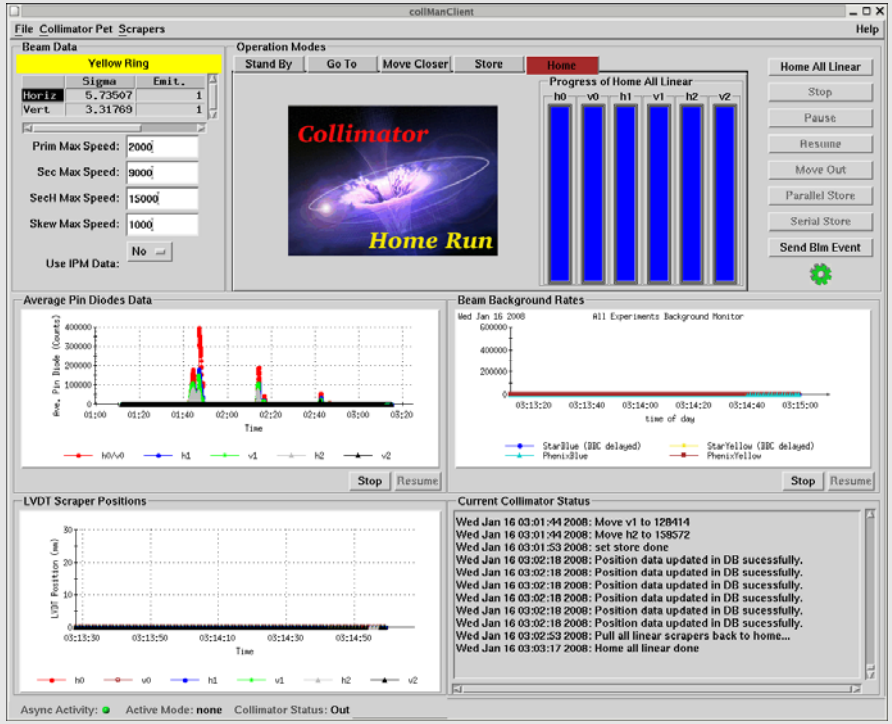


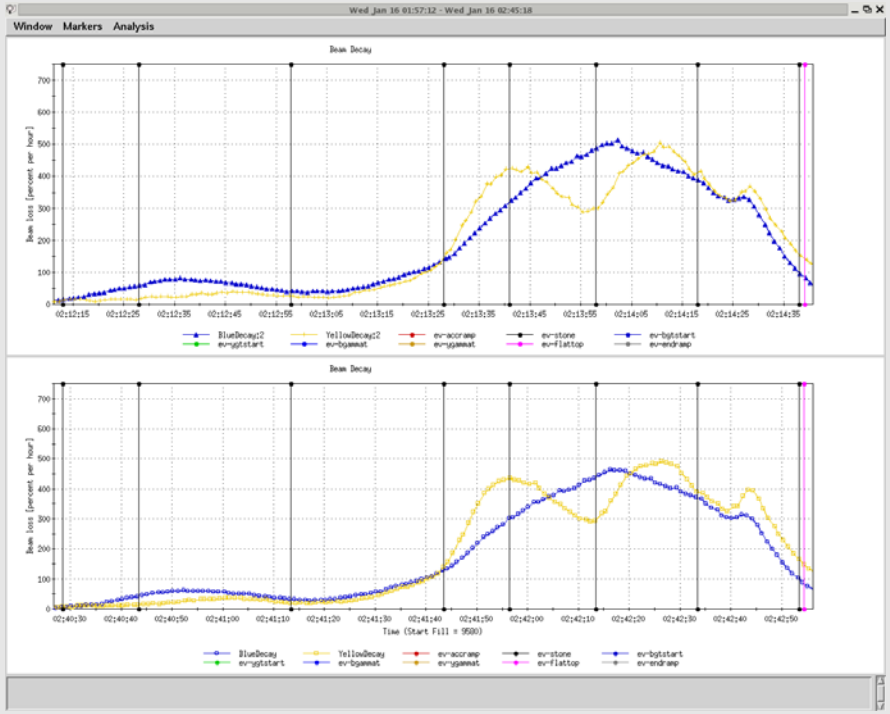
2nd attempt, 9580



- Beam decay signal:
  - Top: last ramp for physics @ 1:00pm 1/15/2008
  - Center: modified ramp @ 1:39am 1/16/2008, first collimation settings
  - Bottom: modified ramp @ 2:09am 1/16/2008, second collimation settings, ramp efficiencies 84% and 82%

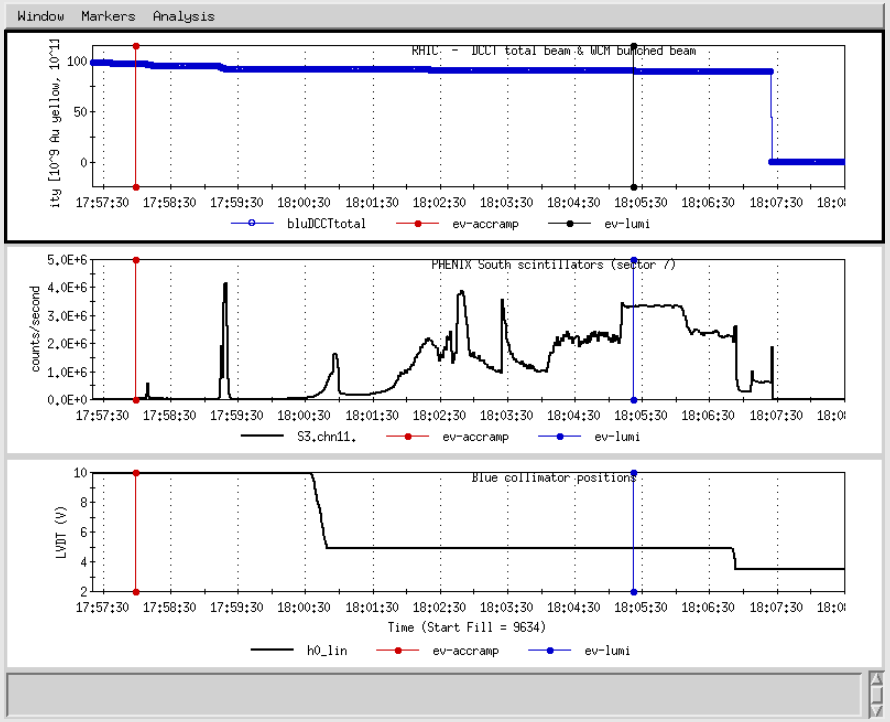
Compare attempts 9579, 9580, 9581



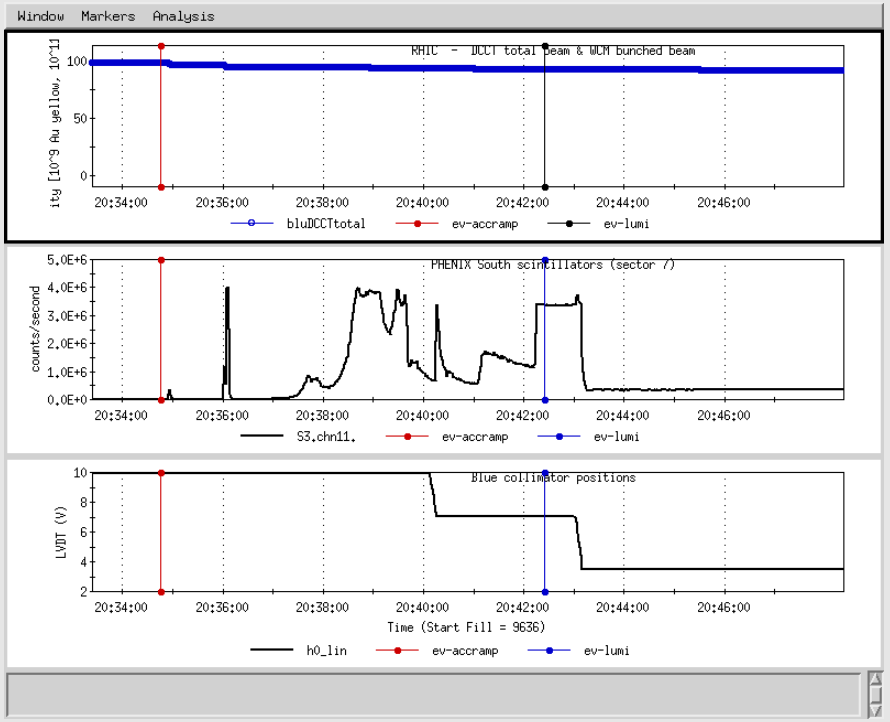


- Pin diode signal decreases as collimators are pulled out by 2-3 mm each time
- beam decay doesn't change (?)

Blue Background at store w coll. on the ramp: no difference :(

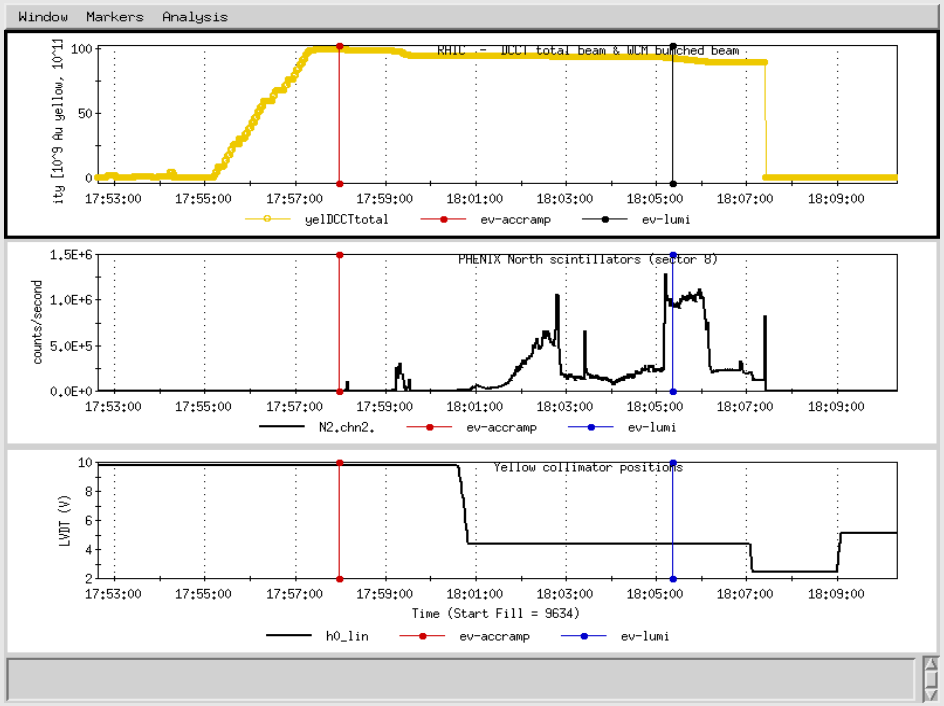


store 9634: collimators in during the ramp. 95 bunches. S3 background signal ~ 3e6 Hz @ lumi-on

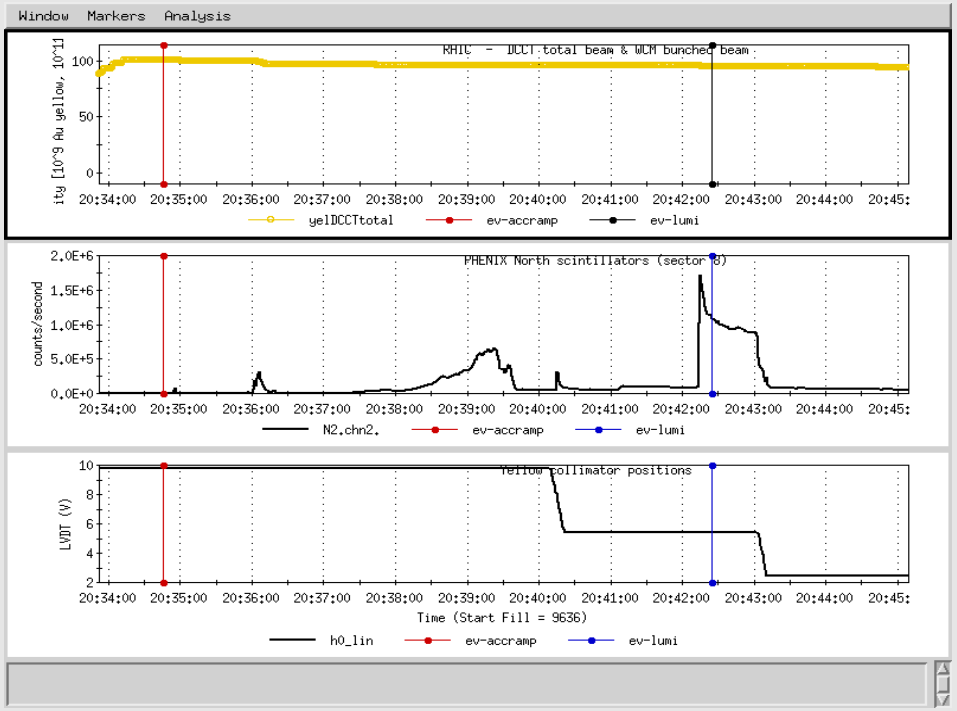


Store 9636: collimators out (or in Stdby) during the ramp. S3 background signal ~ 3e6 Hz.

Yel. Background at store w coll. on the ramp: no difference :(



store 9634: collimators in during the ramp. 95 bunches. N2 background signal ~ 1e6 Hz @ lumi-on



Store 9636: collimators out (or in Stdby) during the ramp. N2 background signal ~ 1e6 Hz.

Summary

- Injection
  - no significant halo present (not done with pp though), some with higher intensities
  - no significant background reduction at store
- Ramp
  - several attempts to collimate during the ramp
  - no change in background conditions at store/collisions