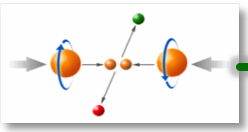
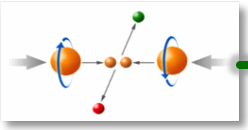


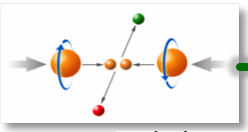
Effect of 11/16 on Polarization Lifetime w.o. collision

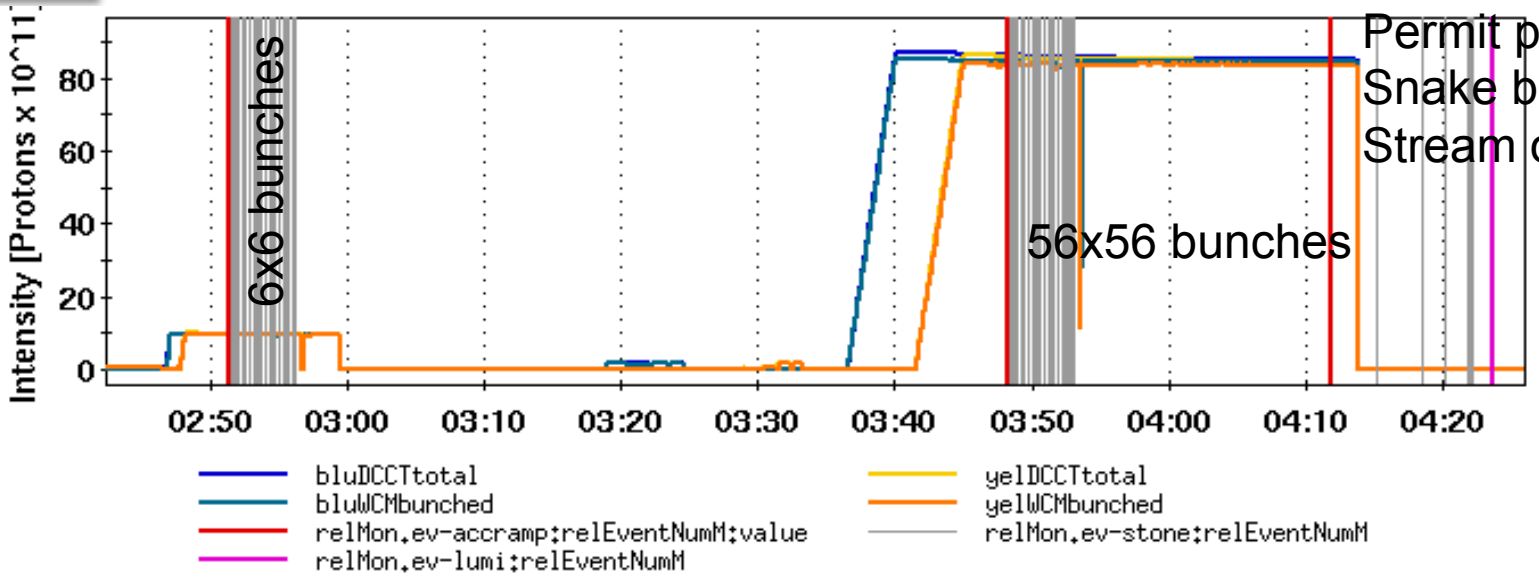
M. Bai, A. Marusic, S. Tepikian, C. Zimmer, Ian, Sean, Dave

What is pp12b-v4?

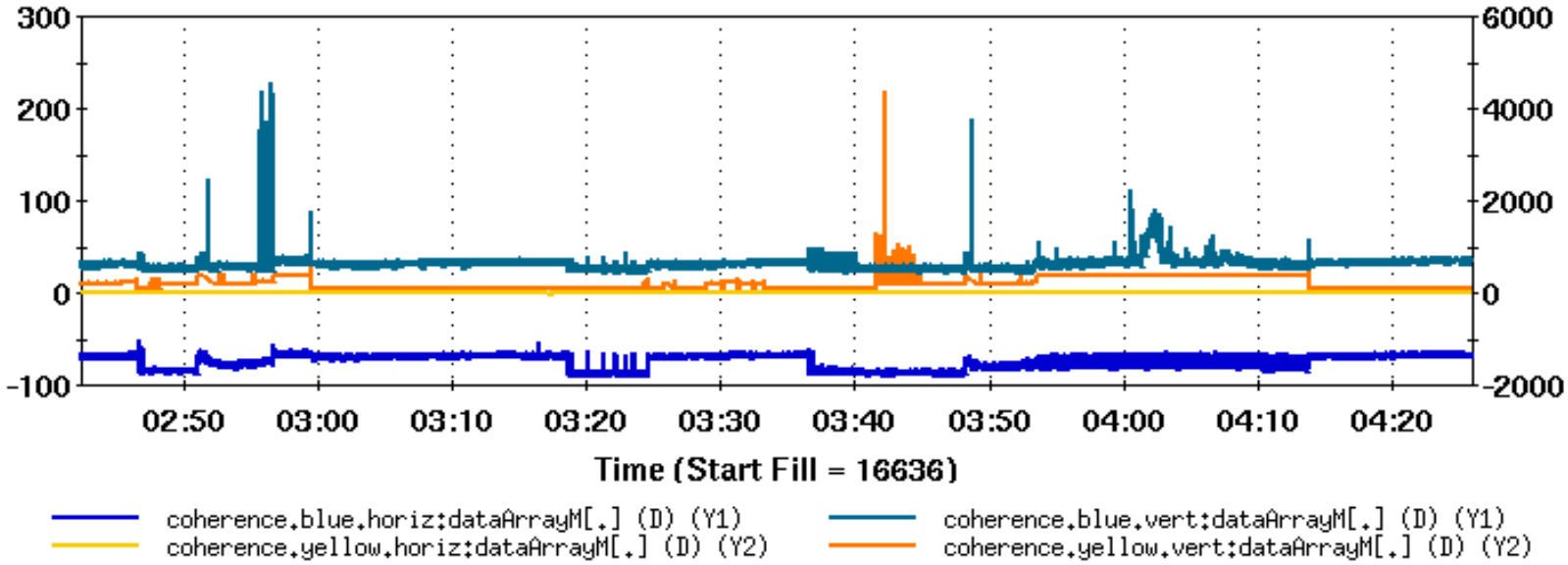


Overview

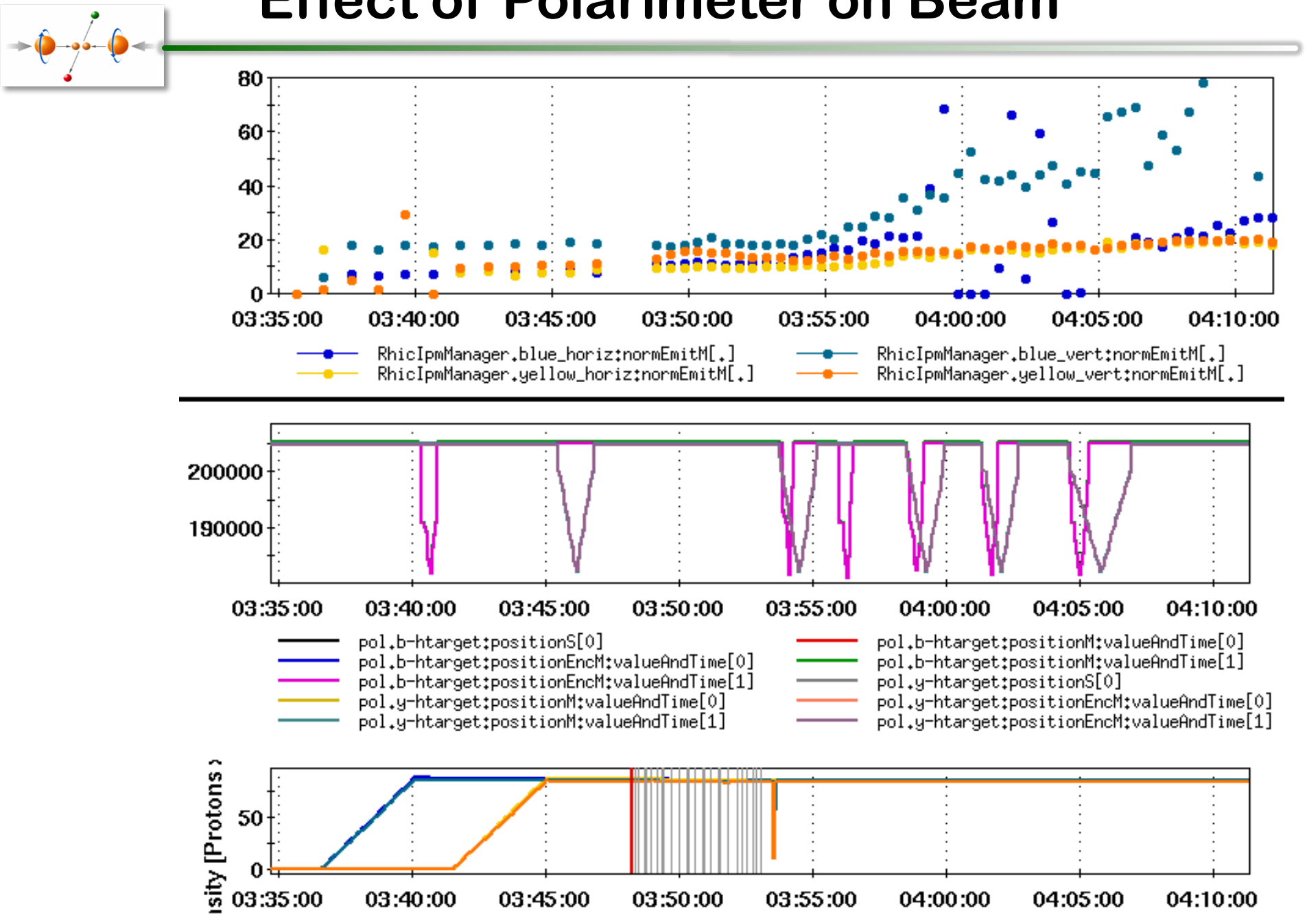




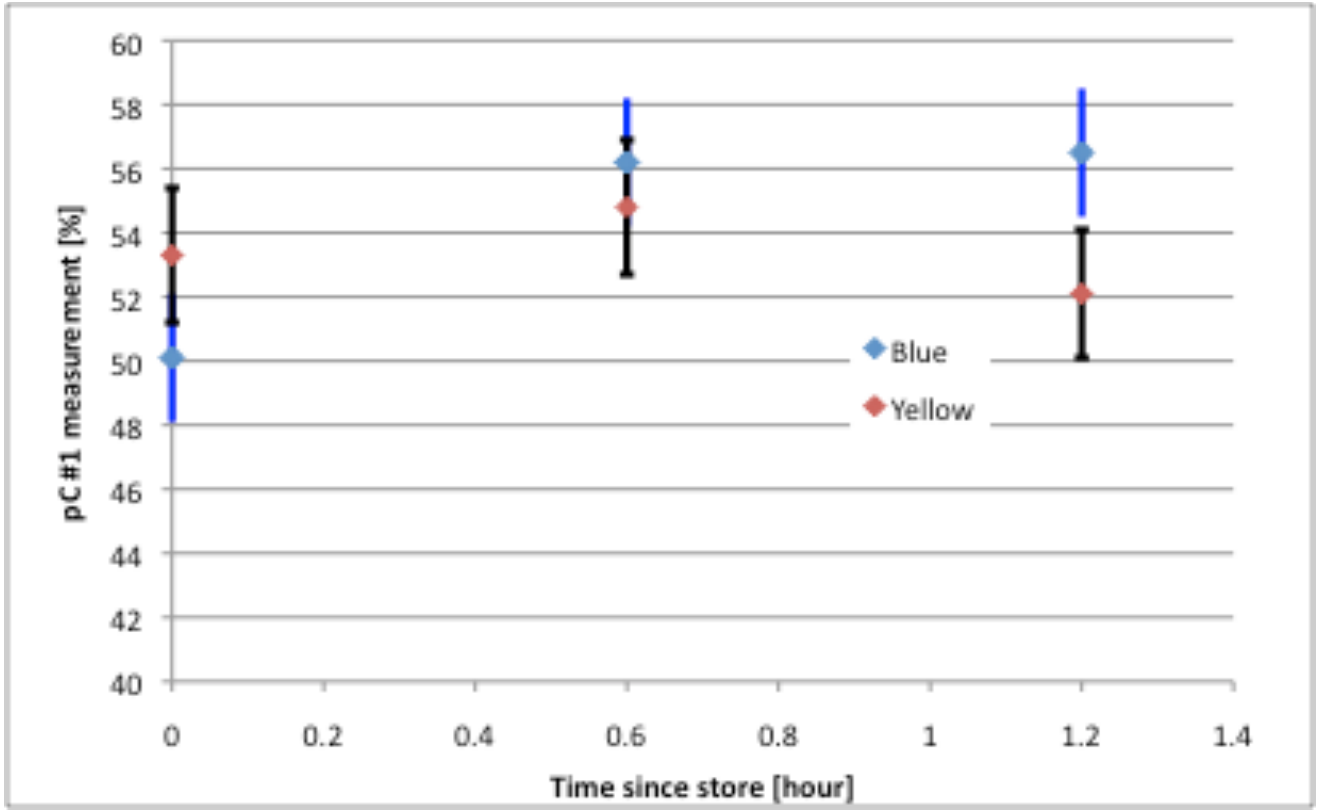
Permit pulled by
Snake blm down
Stream of collimato



Effect of Polarimeter on Beam

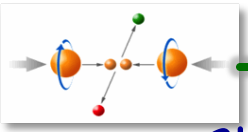


Polarization At Store



- The pC polarimeter data seems to indicate that the effect of 11/16 on polarization is less than 5%
  - orbit much better than 2009. To confirm, measure polarization with Qy=0.6875 during ramp
  - polarization is dominated by beam-beam
- Qy = 0.68 in Blue seems to have no impact on polarization
- lifetime at all, as expected

Conclusions



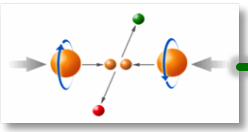
- Closure of ac dipoles is sensitive to the phase between each ac dipole. It comes from both time of flight and errors from each power amplifier

- Second ac dipole bump has much better closure than 1st ac dipole bump. Needs to be understood, #4 and #5 power amplifier may have better linear response. Hope to be mitigated with more effective amplitude feedback.

- First ac dipole bump setting was not very reproducible when the power amplifier were cooled down and brought back on. Optimized phase turned out to be off ~0.22 degrees

- Seth is setting up the RHIC scanner to allow us to automatically/systematically minimize the V DSA peak by scanning the phase/amplitude of the selected ac dipole

Conclusions



- Study the horizontal DSA response due to the ac dipole bumps
  - With single ac dipole, the H DSA response does scale linearly with the strength of the ac dipole
  - In reasonable decoupled ring, H DSA response remained constant with the distance between H and V tunes
  - with DC dipole bump on/off
    - The H DSA response is independent of DC dipole bump on or off
    - the H DSA response scaled with # of ac dipole bumps
  - Data seems to indicate H DSA response is due to the path length change from the ac dipole bumps
    - For 100 Gm ac dipole amplitude, the H oscillation due to the path length change is ~0.0165um with both ac dipole bumps
    - Here assumed, dispersion function is ~ 1 m
    - Single ac dipole V response, ~ 0.55mm assuming:
      - Brho ~ 81.0, gamma=10.5
      - Beta function ~49m(acd), ~100m(DSA)