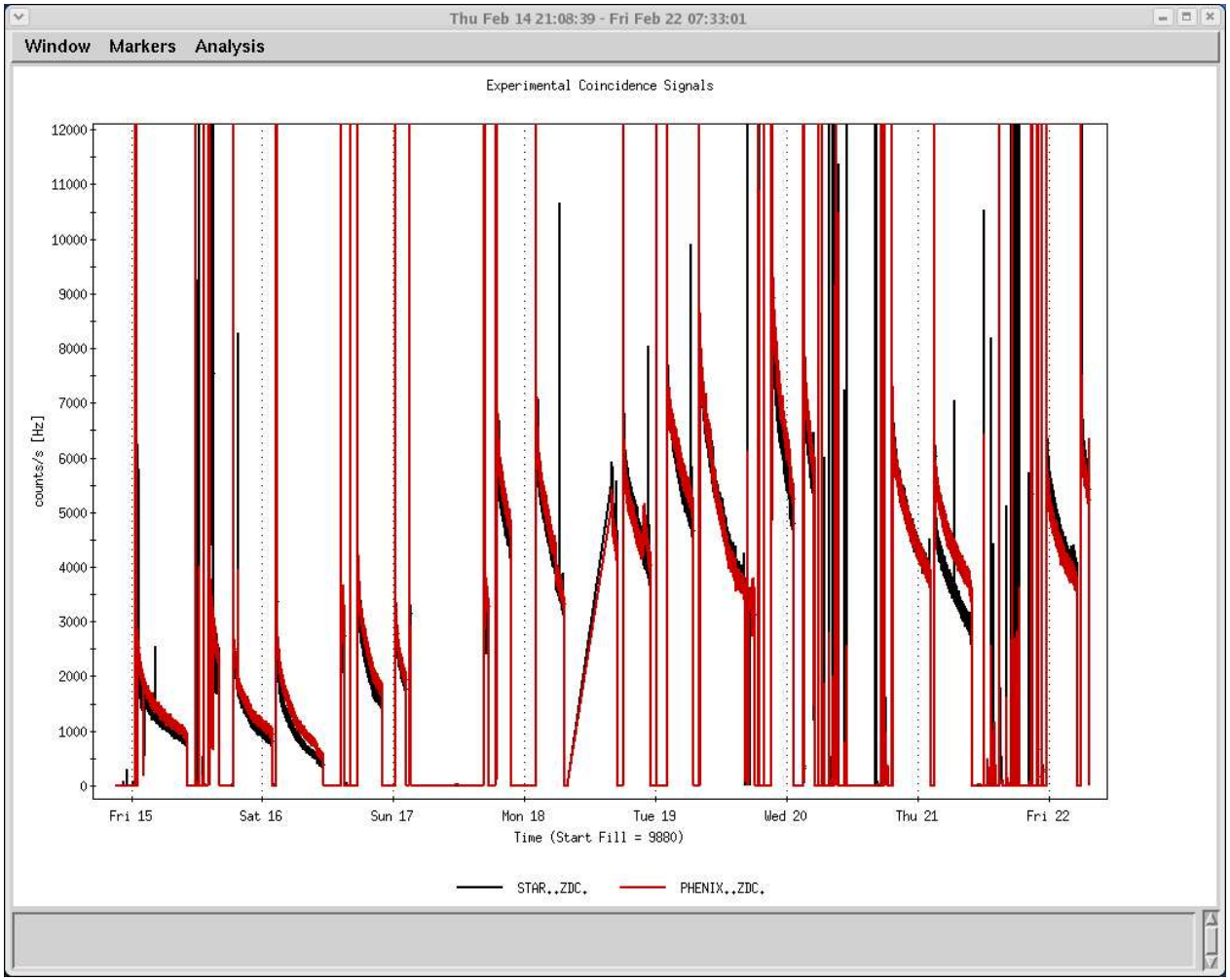
Polarized Proton Run

February 29, 2008

ZDC rates February 15 – 22



Major Events

- Feb. 16: Perceived "long-range beam-beam problem" was found to be actually caused by wrong injection kicker timing. In a 120-bunch pattern, the stored bunch received a small kick when the next bunch was injected. The kick was small enough to not cause intensity loss, but large enough to blow-up the emittance. Increased number of bunches to 109.

- Feb. 17: Changed order of events when going into collisions. First cogging, then separation bump removal by Tape to avoid fast blow-up. Rates double to 7 kHz.

- Feb. 17 – 20: Ramped up bunch intensity to 1.3e11. Best store (9909) provides almost 10 kHz.

- Feb. 20: β^*-squeeze to 60 cm during APEX looks promising.
  Swapped Blue and Yellow orbits at IR 12 for Jet polarimeter.

- Feb. 21: Machine development to make 60 cm ramp (pp83lowbeta) operational.
  Reverted to pp83 ($\beta^* = 1$ m) at 8 PM.

- Feb. 22: Rates are somewhat low (6.5 kHz instead of 8 or 9). Yellow emittance blown up; restored chromaticities to fill 9909 settings.

- Feb. 23: Reverted to fill 9909 to swap IR 12 orbits back to Blue.

- Feb. 24: Polarization in both rings is only 40 percent. Power dip around 10:30. Back at injection after 5 hours.
  An instability in the Blue ring pulls the permit three times at injection. Raising chromaticities helps.
  Next ramp gets lost at accramp due to Yellow instability. Dump looks "dirty". Investigation seems to show that abort kicker is 200 nsec late. Decide to limp along overnight with first few bunches at low intensity.

- Feb. 25: Investigated Blue abort kicker timing. No problem found, appears to have been a red herring all along.
  Polarization is even lower than before the tune adjustments on Sunday morning. Revert those changes. Next store still has only 38 percent, but AGS had only 45 percent (instead of 50+) at time of RHIC injection.

- Feb. 26: Swapped IR 12 orbit back to Yellow beam. Instead of reverting to a previous ramp, this is done at store only.
  APEX. pp83lowbeta ramp seems ready for production stores. 56-bunch ramp attempt erroneously used regular pp83 ramp.

- Feb. 27: Maintenance Day.

- Feb. 28: pp83lowbeta production ramp test with 56 bunches. Yellow nonlinear chromaticity is large, poor lifetime. Blue looks great. 109-bunch ramp gets lost at last stone. Back to pp83.

- Feb. 29: Jet orbit swap to "Blue" position.