Polarized Proton Run

February 12, 2008

Tuesday, February 5

- Overnight store had huge background, one minute periodic Blue beam decay.
- 11:30 AM: Decided to abandon new working point, reload pp28 (as pp83).
- Steve provided new ramp pp83, based on pp28.
- Don tested the new ramp.
- 3:00 PM: Ramp development for pp83 started.

- With snakes at half field, got Blue circulating beam immediately (RF off).

- 5:30 PM: Circulating beam in Yellow, after correcting γ_t polarities.

- 5:45 PM: Snakes at full current, with captured beam.

- 7:10 PM: First ramp attempt.

Wednesday, February 6

- 1:30 AM: Ramp efficiency is 61 percent in Blue, 69 percent in yellow.

- 2:15 AM: Over 90 percent efficiency in both rings for non-Artus bunches. Y_{rms} below 1 mm.

- 4:40 AM: Ramp chromaticity measurement (wiggles). Store dispersion looks good.

- 5:20 AM: 12 bunch ramp, with cogging and separation bump removal. Some steering at IR8 doesn't produce clean collision rates yet.

- Observed large emittances (50π) in both rings, both planes, due to wrong AtR setting.

- Feedback ramps produce > 95 percent transmission in both rings.

- Some polarization at store.

- Rotator ramp development. Second ramp goes through with 97 percent Blue, 89 percent Yellow.

- Provided collisions overnight, without rotator.

Thursday, February 7

- Yellow RF had wrong γ_t value in DSP code. This explains the half-bucket timing shift at store, and also wrong chrom signs during measurements. After fix, Yellow instrumentation – and STAR – needed re-timing.

- Yellow tunes in pp83 until flattop were shifted down by 0.04, causing feedback ramp to fail. This was left over from preparations for a ramp at store tunes.

- Overnight collisions (pp83) with 37x37, 1e11.

Friday, February 8

- First Yellow feedback ramp pp83 failed - too little kick, too much gain. Second one made it, with 99.5 percent efficiency. Zero Yellow polarization after feedback ramp.

- Work on Yellow polarization, adjusting tunes and chromaticities. 30 percent polarization at store in Yellow, 45 percent in Blue.

- Yellow polarization is consistently lower than Blue (about 2/3), even at injection.

- Overnight collisions (pp83) with 56x56, 1e11.

Saturday, February 9

- Bias voltage for Yellow CNI polarimeter was 15 volts instead of 90, resulting in low polarization readings. After raising the voltage, measured polarization in Blue and Yellow is similar.

- Polarization tuning, 50+ percent in both rings.

- Overnight collisions (pp83) with 56x56, 1.1e11.

- Emittance calculated from ZDC rates is quite large, $> 30\pi$.

Sunday, February 10

- 15 minutes with BBQ at injection increased emittances from 13π to 28π. Probably related to increased voltages for BTF.

- Worked on rotator ramp pprot83. First ramp already made it to store. Second ramp was used for decoupling.

- Wrong interpolation of tune/chrom/skew setpoints through rotator ramp caused pprot83 to fail. Problems with RampEditor/RampManager/OptiCalc prevented fixing this.

- Overnight collisions (pp83) with 56x56, 0.8e11 (limited by injectors).

Monday, February 11

- Worked on rotator ramps (pprot83) all day, attempting 109 bunches with 1e11 intensity.

- Beam losses with 109 bunches pulled the permit twice (snapback and store) due to poor separation of beams in IRs.

- Provided overnight collisions with 56 bunches, with rotator.

Plan for the next week(s)

- Fine-tune ramp and collisions, with 109 bunches.
- Increase bunch intensity to maximize luminosity.
- Provide Physics stores.
- β^*-squeeze to 60 cm during APEX.