

Stacking

- Performance
 - Most in an hour: 23.65 mA at Wed Oct 29 03:10:55 CDT 2008
 - Average Production 16.34 e-6/proton
 - Pbars stacked: 275.31 E10 in 23.17 Hr
 - Average POT : 7.55 E12
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Transfers

- Transferred 193mA in 10 transfers over 3 sets.
 - Accumulator to MI efficiency 95% (97% from 35mA stacks)
 - Accumulator to Recycler efficiency was 90% (96% from 35mA stacks)

Column 1 Number _0_Pbar	Column 4 Number_3_Transfer Time	Column 21 Number _20_A:IB	Unstacked (mA)	Column 24 Number _23_R:BE	Stashed	Acc to RR Eff	Column 27 Number _26_MI DCCT SMALL	Column 28 Number _27_MI Before	Acc to MI Eff	Acc to MI2 Eff	Transfers	Sets	
Totals =>		7:00:00 AM	193.04		173.35	89.80%	183.10	182.85	94.85%	94.72%	10	3	
9803	Wednesday, October 29, 2008	1:54:08 AM	164.36	141.71	148.97	124.17	87.63%	133.10	132.91	93.93%	93.79%	6	1
9802	Tuesday, October 28, 2008	8:57:03 AM	36.09	28.01	341.78	27.14	96.91%	27.37	27.35	97.74%	97.65%	2	1
9801	Tuesday, October 28, 2008	7:38:12 AM	37.68	23.32	315.73	22.04	94.51%	22.63	22.60	97.02%	96.89%	2	1

Studies

- Completed some sequencer work.

Requests

1. **Test using the same MI51 position for transfers & normal Stacking/NuMI operation**
 - The goal is to eliminate the routine orbit adjustment near MI-52 that occurs on transfers to the Recycler.
 - The positions are only 1mm different between transfers and normal stacking.
 - This should not make a difference in efficiency.
 - Test doing this during the transfers today.
If efficiencies are unchanged, we'll work towards modifying the sequencer to accommodate the change in the near future.
2. **Access to remove attenuation on Core Vertical Bands 2 and 3.**
 - Access location: Pbar Rings
 - Access time: 1 hour keys to keys.
 - Access work: Remove attenuation from Core Vertical bands 2 and 3.
 - Work Crew: Pete Seifrid and Wes Mueller will be the ones making the access.
 - Post access: We will need to put in calculated values for trombones and attenuators. This can be done parasitically during stacking.
3. **Core Transverse Cooling Measurements**
 - Prerequisites:
 - The access to remove core vertical band 2 and 3 attenuation must be finished.
 - The newly calculated values must be in place for the trombones and attenuators and considered successful.
 - Beam conditions:
 - ~45mA of beam in the Accumulator.

- Background
 - This is a repeat of the core cooling study completed first on the evening of Friday, October 3rd (See <http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=423&anchor=202716&hilite=20:27:16->), and then again on the morning of Friday, October 17th (<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=441&load=>).
 - The October 3rd set of measurements were taken before the Core Vertical Equalizer was installed.
 - The October 17th set of measurements were taken after the Core Vertical Equalizer was installed. Initial indications are that maybe the cooling is worse with the new vertical equalizer.
 - Transfer function measurements made on October 13th (<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=433&anchor=135730&hilite=13:57:30->) determined that the trombone for each band needed to go longer by one wavelength; however, band 2 did not have enough range. This means the measurements taken on October 17th were not with a completely optimized system.
 - Adding additional cable delay requires a tunnel access, which was completed on Wednesday, October 22nd (<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=451&scroll=false&load=>).
 - After the October 22nd access was completed, a new set of Core Vertical transfer function measurements were made (<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=452&anchor=193038&hilite=19:30:38->). An additional set of TFMs were made after this. Valeri calculated ideal Core Vertical trombone and attenuator settings based on these measurements. It was determined that there was not enough gain in the Core Vertical band 2 and 3 systems to fully implement the change. The systems can be modified to accommodate the change, but another tunnel access is required.
 - On Friday, October 24th, an attempt to put in the new trombone settings and put in the correct ratio of band 1, 2 and 3 gains was made (<http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=455&scroll=false&load=>). Since there was not enough room in bands 2 and 3, experts tried lowering band 1 in order to get the correct ratio. The results showed that the emittances were worse. A tunnel access is still required to get the desired gain from Core Vertical bands 2 and 3.
 - Once the tunnel access has been completed and the ideal settings put into place, we can continue with this set of measurements.
 - This study repeats core vertical cooling measurements made on October 3rd and 17th, with the new equalizer in place, with the appropriate cable delays and pad removal to properly tune the trombones and attenuators.
- The study
 - The studier is Jim Morgan
 - The estimated time is 2+ hours.
 - The study involves blowing the beam up and cooling it back down for each core vertical cooling band.

4. **Static Stacktail Measurements.**

- Prerequisites:
 - Vander has sequencer code to complete before this study can be done. The hope is this code can be completed sometime this week.
- Conditions:
 - This study should be started directly before a set of transfers to Recycler. We want a 30mA stack.
 - Prior to the start of this study, we would like five supercycles of stacking without SY120 or Studies events in the TLG. This will allow setup the stacktail in a known condition for the study.
- The Study:
 - A Numi-only TLG is loaded
 - The studier is Dave Vander Meulen
 - The estimated study time is 20 minutes.
- After the study is complete, we can transfer to the Recycler.

- After the study is complete, we can transfer to the Recycler.
 - Leave > 10mA of beam behind for the next study.
5. **Stacktail Transfer Function Measurements:**
- Conditions:
 - This study will start with 10mA leftover after a set of transfers.
 - The Study
 - The studiers are Steve Werkema and Ralph Pasquinelli.
 - The estimated study time is 4 hours.
 - If beam is lost during any of the measurements, we need to be able to stack for short periods of time to replace the beam for the next set of measurements.

The Numbers

- Paul's Numbers
 - Most in an hour: 23.65 mA at Wed Oct 29 03:10:55 CDT 2008
 - Best: 37.52 mA on 25-Oct-08
 - Average Production 16.34 e-6/proton Best: 25.41 e-6/proton on 01/30/2008
 - Average Protons on Target 7.39 e12 Best: 8.77 e12 on 07/24/2007
 - Largest Stack 165.80 mA Best: 313.58 mA on 02/18/2008
- Al's Numbers
 - Stacking
 - Pbars stacked: 275.31 E10
 - Time stacking: 23.17 Hr
 - Average stacking rate: 11.88 E10/Hr
 - Uptime
 - Number of pulses while in stacking mode: 24632
 - Number of pulses with beam: 21556
 - Fraction of up pulses was: 87.51%
 - The uptime's effect on the stacking numbers
 - Corrected time stacking: 20.28 Hr
 - Possible average stacking rate: 13.58 E10/Hr
 - Could have stacked: 314.60 E10/Hr
 - Recycler Transfers
 - Pbars sent to the Recycler: 193.04 E10
 - Number of transfers : 10
 - Number of transfer sets: 3
 - Average Number of transfer per set: 3.33
 - Time taken to shoot including reverse proton tuneup: 00.06 Hr
 - Transfer efficiency: 89.24%
 - Other Info
 - Average POT : 7.55 E12
 - Average production: 16.92 pbars/E6 protons
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Other