

The Supertable (Introducing Supertable II)

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Run II meeting
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Introduction

- ❖ Keeping the **Supertable** as the **official document** of the best information we have available for each store, is a big integration task and a collaborative effort of many individuals.
- ❖ I will try to thank in the end everybody contributing in this effort to the best of my knowledge.

Outline

- ❖ What information we save in the Supertable
- ❖ What is the basis of this information
- ❖ Links and other related Tables
- ❖ How we track problems
- ❖ Supertable vs Supertable II (**mixed pbar source**)
- ❖ Upcoming changes

Information saved in the Supertable

- ❖ The Supertable is a systematic tabulation of the best information we have available on: **intensities**, **efficiencies**, **transverse emittances** and their growth rates (FW and SL), **bunch lengths**, **lifetimes**, etc., on a store by store basis and throughout the acceleration chain.
- ❖ We also store there measured instantaneous and integrated **luminosities**, proton and pbar **losses**, **tunes**, **chromaticities**, comments about the store.

Information saved in the Supertable

- ❖ In addition we save in the Supertable **calculated quantities** (Hour Glass factor, effective emittance, expected luminosity, etc.)

Source of information

- ❖ SDA Database (time stamps, luminosities, intensities, efficiencies)
- ❖ Dataloggers (lifetimes, emittances, emittance growths, tunes, chromaticities)
- Osdaphysics (**Offline Shot Data Analysis Physics package**). Compute lifetimes, emittances, etc. with best possible algorithms that are not available at the Front-End. (**Front-End capabilities, networking issues, etc.**)

Devices – Algorithms

- ❖ We use the FBI devices for intensities, efficiencies (**Will use SBD in Supertable II**).
- ❖ We use the SBD devices for lifetime calculation.
Both FBI and SBD are calibrated against the DCCT.
- ❖ We use the Flying Wire, SynchLight and SBD devices for emittance calculations (FW E11H and FWE17H, lattice functions, $\Delta p/p$)

Devices – Algorithms

- ❖ For tunes and chromaticities we use the 1.7 GHz resonator whose spectrum is analysed by two dedicated OACs; **Shotpr** and **Shotpb**.
- ❖ For the initial luminosity we are using the Maximum value of C:B0ILUM[0] and C:D0FZTL in the time interval between V:TSCRAP=3 (start of scraping) and V:CLDRST=14 (HEP).

Devices – Algorithms

- ❖ For the integrated luminosity per store we are using the sum over all HEP sets of C:B0ILUM[0] (CDF) and C:D0FZTL (D0)
- ❖ Total delivered luminosity since the beginning of Run II is 645.69 pb⁻¹ for CDF

Supertable Organization

- ❖ One line per store
- ❖ 142 Columns of information in Supertable.
(195 Columns in Supertable II)
- ❖ Documentation available for every column at the headers of the html file or in:
<http://www-bd.fnal.gov/SDAMisc/SupertableDescription/SupertableIIDescription/>

Supertable

| 0 Store # | 1 Date started shot set up | 2 time start set up | 3 time proton load | 4 time pbar load | 5 time HEP | 6 date/ time end store | 7 store length (hours) | 8 how store ended | 9 Comments | 10 start stack | 11 unstacking fraction | 12 amount unstacked -1E10 | 13 pbars at 150 | 14 pbars at Remove Halo - 1E09 |
|-----------|----------------------------|---------------------|--------------------|------------------|------------|------------------------|------------------------|-------------------|------------|----------------|------------------------|---------------------------|-----------------|--------------------------------|
| 3745 | 8/22/2004 | 13:20:22 | 14:15:20 | 14:35:36 | 15:21:45 | 4:06:33 | 13.04 | Normal | no comment | 129.99 | 0.96 | 125.2 | 953 | 817.63 |
| 3744 | 8/21/2004 | 19:16:58 | 20:44:27 | 20:57:16 | 21:36:49 | 13:09:06 | 15.75 | Normal | no comment | 160.99 | 0.92 | 147.8 | 1121.06 | 950.48 |
| 3739 | 8/18/2004 | 1:09:22 | 2:47:14 | 2:58:44 | 3:40:37 | 9:01:23 | 29.53 | Normal | no comment | 165.59 | 0.92 | 151.6 | 1213.01 | 1011.48 |
| 3736 | 8/16/2004 | 16:21:00 | 17:07:23 | 17:22:56 | 18:13:18 | 17:30:10 | 23.49 | need calcu | no comment | 124.19 | 0.96 | 119 | 946.81 | 799.74 |
| 3725 | 8/12/2004 | 11:47:56 | 14:02:48 | 14:17:54 | 15:03:39 | 21:45:13 | 30.86 | Normal | Mixed-pba | 159.39 | 0.92 | 147 | 1430.56 | 1233.31 |
| 3723 | 8/11/2004 | 4:13:02 | 5:32:14 | 5:53:54 | 7:00:06 | 8:10:46 | 25.36 | Normal | Mixed-pba | 115.79 | 0.93 | 107.4 | 1034.15 | 897.96 |
| 3717 | 8/8/2004 | 18:46:06 | 19:30:37 | 19:58:44 | 20:46:20 | 12:11:32 | 39.66 | Normal | no comment | 179.39 | 0.91 | 163.2 | 1301.03 | 1027.93 |
| 3715 | 8/6/2004 | 23:16:20 | 2:20:16 | 2:34:47 | 3:28:32 | 18:00:05 | 38.73 | Normal | no comment | 144.19 | 0.92 | 132.4 | 1007.61 | 863.15 |
| 3711 | 8/5/2004 | 10:33:16 | 11:00:43 | 11:13:54 | 11:57:48 | 9:02:50 | 21.27 | Normal | Mixed-pba | 75.99 | 0.94 | 71.6 | 871.29 | 817.25 |
| 3699 | 8/2/2004 | 9:01:58 | 10:33:05 | 10:48:43 | 11:40:00 | 12:30:38 | 24.56 | Normal | no comment | 144.99 | 0.91 | 132 | 1153.02 | 961 |
| 3692 | 7/30/2004 | 22:51:00 | 23:41:48 | 23:53:58 | 0:34:23 | 13:24:00 | 11.06 | TotalQuen | Quench, B | 167.39 | 0.92 | 153.4 | 1300.63 | 1072.95 |
| 3685 | 7/29/2004 | 20:53:14 | 22:04:39 | 22:36:49 | 23:21:28 | 11:52:47 | 12.72 | TotalQuen | Quench, B | 173.39 | 0.91 | 157.4 | 1254.59 | 1057.52 |
| 3678 | 7/27/2004 | 22:12:20 | 23:13:24 | 23:44:27 | 0:27:47 | 13:03:33 | 36.83 | Normal | no comment | 184.19 | 0.91 | 168 | 1493.55 | 1221.88 |
| 3676 | 7/26/2004 | 16:44:48 | 18:26:43 | 18:57:37 | 19:38:12 | 20:10:48 | 24.57 | Normal | Longitudin | 164.79 | 0.91 | 150.2 | 1220.91 | 1064.71 |
| 3674 | 7/25/2004 | 6:10:32 | 7:55:55 | 8:27:22 | 9:07:05 | 13:11:02 | 28.21 | Normal | no comment | 188.79 | 0.91 | 171.8 | 1479.11 | 1215.64 |
| 3671 | 7/24/2004 | 0:21:52 | 1:55:31 | 2:58:37 | 3:44:55 | 5:03:03 | 25.52 | Normal | C49V sepa | 167.79 | 0.92 | 153.8 | 1326.25 | 1058.48 |
| 3665 | 7/21/2004 | 20:20:56 | 21:26:06 | 21:43:18 | 22:30:30 | 5:03:36 | 29.94 | TevQuench | Mixed-pba | 161.59 | 0.93 | 150.4 | 1580.11 | 1347.81 |
| 3663 | 7/20/2004 | 7:19:43 | 8:04:26 | 9:26:18 | 10:08:26 | 18:58:08 | 33.04 | Normal | Mixed-pba | 168.39 | 0.78 | 131.8 | 1451.01 | 1281.25 |

Supertable

| 20 protons/bunch at Remove Halo | 21 CDF initial luminosity | 22 D0 initial luminosity | 23 average initial luminosity | 24 CDF integrated lum for this store nb-1 | 25 D0 integrated lum for this store nb-1 | 26 CDF total delivered integrated luminosity pb-1 | 27 D0 total delivered integrated luminosity pb-1 | 28 average total delivered luminosity pb-1 | 29 CDF luminosity calculated at low beta | 30 Accumulator start freq width | 31 Accumulator average long sigma | 32 MI 8 GeV avg long sigma | 33 MI pbar coalescing efficiency | 34 MI pbar bunch length after coalescing |
|------------------------------------|---------------------------|--------------------------|-------------------------------|---|--|---|--|--|--|---------------------------------|-----------------------------------|----------------------------|----------------------------------|--|
| 250.07 | 62.81 | 59.66 | 61.23 | 1643.47 | 1616.62 | 645.6928 | 600.7262 | 623.21 | 65.31 | 33.8 | 206.81 | 2.18 | 0.93 | 2.44 |
| 256.73 | 69.67 | 62.64 | 66.16 | 2114.75 | 1959.41 | 644.0493 | 599.1095 | 621.58 | 69.35 | 27.3 | 187.01 | 2.18 | 0.91 | 2.42 |
| 251.29 | 80.45 | 71.4 | 75.93 | 3332.58 | 3076.04 | 641.9346 | 597.1501 | 619.54 | 80.11 | 24.7 | 183.89 | 2.09 | 0.92 | 2.4 |
| 253.27 | 62.22 | 56.87 | 59.54 | 2310.52 | 2197.94 | 638.602 | 594.0741 | 616.34 | 58.98 | 22.75 | 177.74 | 1.97 | 0.96 | 2.31 |
| 245.17 | 98.96 | 83.58 | 91.27 | 3912.04 | 3546.39 | 636.2915 | 591.8761 | 614.08 | 98.74 | 26.98 | 182.72 | 2.14 | 0.86 | 2.62 |
| 239.11 | 64.37 | 58.95 | 61.66 | 2511.75 | 2349.75 | 632.3794 | 588.3298 | 610.35 | 64.94 | 32.17 | 217.29 | 2.24 | 0.89 | 2.54 |
| 252.67 | 80.65 | 70.82 | 75.73 | 3725.35 | 3456.76 | 629.8677 | 585.98 | 607.92 | 79.45 | 27.95 | 161.08 | 1.97 | 0.91 | 2.41 |
| 248.02 | 62.41 | 56.72 | 59.56 | 2956.47 | 2803.28 | 626.1423 | 582.5232 | 604.33 | 62.35 | 27.3 | 180.29 | 1.99 | 0.92 | 2.4 |
| 237.07 | 46.54 | 43.12 | 44.83 | 1791.09 | 1712.03 | 623.1859 | 579.72 | 601.45 | 45.57 | 20.8 | 195.39 | 2.23 | 0.98 | 2.51 |
| 245.84 | 70.08 | 63.42 | 66.75 | 2611.78 | 2446.36 | 621.3948 | 578.0079 | 599.7 | 70.76 | 23.4 | 176.17 | 1.94 | 0.91 | 2.38 |
| 255.89 | 85.23 | 72.8 | 79.01 | 1952.83 | 1736.21 | 618.783 | 575.5616 | 597.17 | 81.07 | 26.32 | 179.79 | 2.02 | 0.92 | 2.41 |
| 252.01 | 76.4 | 66.8 | 71.6 | 1829 | 1641.32 | 616.8302 | 573.8254 | 595.33 | 75.68 | 26.98 | 180.01 | 1.99 | 0.93 | 2.49 |
| 248.76 | 89.66 | 76.51 | 83.09 | 4059.58 | 3710.65 | 615.0012 | 572.184 | 593.59 | 8.04 | 26 | 178.72 | 1.96 | 0.94 | 2.36 |
| 225.38 | 77.16 | 66.87 | 72.02 | 2805.78 | 2542.14 | 610.9416 | 568.4734 | 589.71 | 72.81 | 24.05 | 178.89 | 1.96 | 0.94 | 2.31 |
| 252.56 | 87.63 | 75.1 | 81.37 | 3557.78 | 3191.31 | 608.1358 | 565.9313 | 587.03 | 85.11 | 26.65 | 178.42 | 1.94 | 0.92 | 2.38 |
| 230.2 | 28.39 | 28.95 | 28.67 | 2918.7 | 2738.44 | 604.578 | 562.7399 | 583.66 | 74.45 | 23.72 | 176.16 | 2.05 | 0.94 | 2.34 |
| 250.32 | 92.44 | 79.09 | 85.77 | 3699.2 | 3357.19 | 601.6593 | 560.0015 | 580.83 | 92.68 | 25.02 | 204.79 | 2.02 | 0.86 | 2.58 |
| 252.98 | 97.93 | 83.79 | 90.86 | 3863.61 | 3536.9 | 597.9601 | 556.6443 | 577.3 | 0 | 25.02 | 165.33 | 1.86 | 0.91 | 2.38 |

Supertable Logistics

- ❖ The Supertable is computed in DUE24, while Supertable II is computed in DCE01.
- ❖ The Supertable is computed 3 times during the duration of the store. After the first set of HEP, 3 hours into the store and in the end of each store.
- ❖ Some information sent to the Shot Scrapbook.
- ❖ We keep all information consistent since June 6 2003, store 2658.

Links

Shot Data Analysis ([SDA](#))

Contents:

- [Summary](#)
([Supertable](#))
- [Applications and Tools](#)
- [Documentation & Notes](#)

The Shot Data Analysis (SDA) software tools are intended for offline studies of Tevatron complex performance during RunII. Beam physicists and engineers can access the Shot Data from their workstations, using a collection of Java and/or Web based applications to plot and export data tables to other packages for further studies. This can be accomplished via extensive post-mortem analysis, trending over significant periods, selection of particularly successful stores and so forth.

All SDA application and APT's are accessible from this page. Most of these applications are available via the [Java Web Start](#) Application Manager, from [Sun Microsystems](#). The current version of Java (required to run the applications described here) is 1.4.2.

The programs and data sources referenced here are administered by the [SDA Group](#) in the [Integrations Department](#) and in the [Accelerator Controls Department](#), both of which are in the [Accelerator Division](#), and from various departments in the [Computing Division](#).

Summary Information/Tables

| | |
|--|--|
| Collider Shot | Log , Automatically-generated log files from the SDA process Summary of the Collider Shot data acquisition. Efficiencies : Step efficiencies for the protons and the antiprotons from the sources to low beta Emittances (<i>Contact Timofei for explanation</i>) Intensities (<i>Contact Timofei for details</i>) |
| Pbar Transfer Shot | Log Summary |
| Recycler Shot | Log Summary |
| Store based Error List | This is a list of the errors extracted from the log file. You can specify the store, or list of stores, for which to see the errors. |

Supertable Links

❖ <http://www-bd.fnal.gov/SDAMisc/supertable.html>
<http://www-bd.fnal.gov/SDAMisc/supertable.xls>

http://www-bd.fnal.gov/SDAMisc/supertable_10.html
http://www-bd.fnal.gov/SDAMisc/supertable_10.xls

❖ <http://www-bd.fnal.gov/SDAMisc/supertableII.html>
<http://www-bd.fnal.gov/SDAMisc/supertableII.xls>

http://www-bd.fnal.gov/SDAMisc/supertableII_10.html
http://www-bd.fnal.gov/SDAMisc/supertableII_10.xls

Other Related Tables

- ❖ Supertable Views and more elaborate analysis programs.
- ❖ Recomputed emittance minitables
- ❖ Intensity/Efficiency minitables
- ❖ Derived/Detailed Tables (bunch by bunch)

Other Related Links

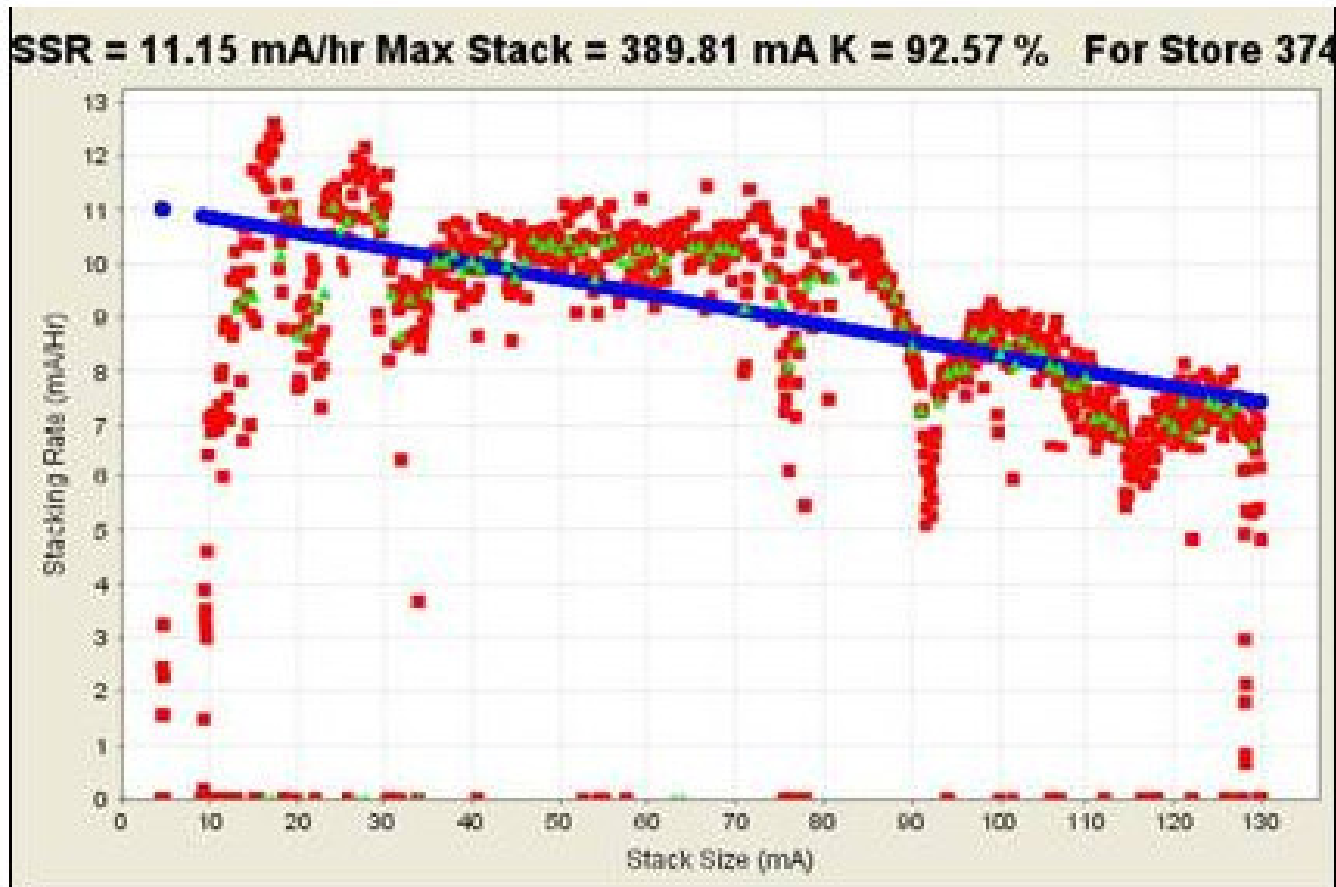
- ❖ http://www-bdnew.fnal.gov/tevatron/TevStoreSummary_new.xls
- ❖ http://www-bdnew.fnal.gov/hq-integration/AimData/SDA_summary_files/frame.htm
- ❖ http://www-bd.fnal.gov/SDA_Viewer/shot_emittances_catalog.jsp
- ❖ <http://www-bd.fnal.gov/sdaservlet/SDA?report=ColliderShot&type=Efficiencies>

The TevStoreSummary Supertable View

| Store | Date | Avg Initial Lumi [E30] | Lumi Life time [hr] | Eff Emit. from Lumi [pi mm mrad] | Eff Emit Life Time [hr] | Prot Horz SL Emit [pi mm mrad] | Prot Horz SL Emit Life Time [hr] | Prot Vert SL Emit [pi mm mrad] | Prot Vert SL Emit Life Time [hr] | Pbar Horz SL Emit [pi mm mrad] | Pbar Horz SL Emit Life Time [hr] | Pbar Vert SL Emit [pi mm mrad] | Pbar Vert SL Emit Life Time [hr] | Prot RMS Bunch Length [ns] | Prot Length Life Time [hr] | Pbar RMS Bunch Length [ns] | Pbar Length Life time [hr] | |
|-------|---------|------------------------|---------------------|----------------------------------|-------------------------|--------------------------------|----------------------------------|--------------------------------|----------------------------------|--------------------------------|----------------------------------|--------------------------------|----------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|---------|
| 3745 | 8/22/04 | 61.2 | 8.3 | 16.7 | 14.5 | 53.4 | -28.2 | 46.3 | -26.9 | 168.4 | 1.9 | 57.3 | -62.4 | 1.56 | -22.9 | 1.36 | -60.2 | 7360698 |
| 3744 | 8/21/04 | 66.2 | 9.0 | 18.6 | 16.4 | 293.0 | -15.5 | 235.9 | -15.1 | 430.2 | 3.0 | 369.2 | 8.0 | 1.54 | -24.3 | 1.41 | -83.3 | 8784488 |
| 3739 | 8/18/04 | 75.9 | 8.5 | 16.6 | 15.4 | 49.8 | -21.2 | 42.8 | -17.4 | 194.3 | -81.3 | 59.6 | 56.7 | 1.60 | -21.4 | 1.47 | -76.3 | 9150141 |
| 3736 | 8/16/04 | 59.5 | 8.5 | 16.8 | 14.9 | 54.6 | -26.2 | 48.9 | -21.8 | 184.1 | -90.2 | 56.1 | -58.7 | 1.58 | -26.3 | 1.41 | -49.5 | 7291717 |
| 3725 | 8/12/04 | 91.3 | 7.9 | 16.7 | 15.7 | 50.9 | -24.3 | 44.6 | -21.1 | 184.3 | -80.6 | 55.4 | -56.0 | 1.57 | -23.1 | 1.56 | -41.0 | 1.1E+07 |
| 3723 | 8/11/04 | 61.7 | 8.7 | 17.3 | 21.2 | 52.7 | -29.7 | 46.9 | -20.3 | 175.1 | -46.7 | 52.1 | -35.8 | 1.61 | -33.2 | 1.58 | -44.3 | 7729559 |
| 3717 | 8/8/04 | 75.7 | 8.4 | 17.2 | 14.2 | 48.9 | -20.6 | 42.5 | -17.1 | 40.9 | -101.5 | 26.6 | -56.3 | 1.62 | -22.0 | 1.46 | -63.2 | 9350226 |
| 3715 | 8/6/04 | 59.6 | 8.6 | 18.0 | 17.7 | 53.7 | -32.1 | 50.1 | -27.7 | 39.7 | -51.7 | 28.5 | -57.2 | 1.57 | -31.5 | 1.49 | -34.0 | 7706963 |
| 3711 | 8/5/04 | 44.8 | 10.4 | 20.6 | 24.4 | 70.3 | -42.1 | 65.1 | -44.6 | 48.4 | 34.8 | 20.9 | 20.5 | 1.51 | -35.9 | 1.48 | -122.1 | 6974902 |
| 3699 | 8/2/04 | 66.8 | 8.2 | 16.4 | 16.4 | 58.2 | -26.8 | 47.2 | -22.0 | 33.9 | -49.8 | 22.1 | -43.8 | 1.56 | -29.3 | 1.48 | -40.8 | 8505090 |
| 3692 | 7/30/04 | 79.0 | 8.0 | 16.3 | 14.4 | 53.4 | -18.9 | 46.3 | -15.8 | 31.5 | -74.1 | 23.4 | -118.9 | 1.58 | -21.0 | 1.45 | -47.1 | 9884058 |
| 3685 | 7/29/04 | 71.6 | 8.5 | 17.1 | 15.3 | 60.2 | -25.3 | 47.2 | -25.5 | 34.9 | -52.7 | 22.7 | -31.8 | 1.61 | -27.3 | 1.46 | -40.5 | 9594287 |
| 3678 | 7/27/04 | 83.1 | 8.3 | 17.1 | 13.4 | 56.5 | -19.9 | 43.8 | -17.4 | 35.8 | -57.6 | 24.0 | -50.0 | 1.63 | -22.4 | 1.45 | -51.6 | 1.1E+07 |
| 3676 | 7/26/04 | 72.0 | 8.1 | 14.9 | 13.4 | 52.1 | -20.5 | 41.1 | -17.7 | 34.5 | -51.2 | 22.5 | -48.5 | 1.72 | -18.4 | 1.34 | -79.0 | 8638759 |
| 3674 | 7/25/04 | 81.4 | 8.8 | 17.2 | 15.2 | 56.1 | -18.7 | 44.1 | -16.6 | 36.5 | -56.8 | 24.7 | -54.1 | 1.61 | -22.5 | 1.45 | -57.3 | 1.1E+07 |
| 3671 | 7/24/04 | 28.7 | NaN | 38.3 | #### | 59.9 | NaN | 50.1 | NaN | 35.9 | NaN | 23.0 | NaN | 1.73 | NaN | 1.53 | NaN | 8771656 |
| 3665 | 7/21/04 | 85.8 | 8.3 | 17.9 | 17.4 | 59.0 | -25.2 | 50.1 | -23.4 | 38.6 | -74.8 | 24.1 | -44.1 | 1.57 | -26.6 | 1.54 | -43.9 | 1.2E+07 |
| 3663 | 7/20/04 | 90.9 | 7.5 | -0.2 | 20.9 | -7.8 | -22.0 | 0.0 | -20.3 | NaN | -73.5 | 0.0 | -33.8 | 2.58 | #### | NaN | -49.0 | 1.2E+07 |
| 3661 | 7/18/04 | 75.0 | 8.2 | 16.8 | 13.7 | 56.4 | -20.4 | 47.3 | -18.5 | 38.2 | -52.0 | 23.6 | -35.2 | 1.56 | -21.5 | 1.46 | -44.3 | 9916953 |
| 3659 | 7/17/04 | 29.9 | 15.0 | 27.4 | 35.1 | 77.8 | -32.3 | 74.9 | -28.1 | 44.7 | -12.1 | 35.5 | 20.0 | 1.51 | -28.8 | 1.31 | -181.0 | 6311492 |
| 3657 | 7/16/04 | 102.8 | 7.8 | 17.1 | 15.4 | 54.3 | -21.5 | 45.9 | -19.6 | 39.1 | -50.5 | 25.0 | -41.1 | 1.60 | -22.7 | 1.63 | -54.7 | 1.4E+07 |
| 3655 | 7/14/04 | 77.8 | 8.5 | 17.8 | 14.5 | 56.1 | -20.8 | 45.8 | -17.9 | 40.1 | 58.7 | 24.2 | -65.5 | 1.55 | -20.4 | 1.45 | -61.3 | 1.1E+07 |
| 3653 | 7/13/04 | 74.2 | 8.6 | 17.7 | 15.8 | 56.7 | -23.0 | 47.6 | -20.5 | 40.1 | -70.4 | 26.3 | -50.4 | 1.55 | -24.6 | 1.43 | -41.5 | 1E+07 |
| 3650 | 7/12/04 | 65.8 | 7.9 | 15.4 | 13.3 | 86.9 | NaN | 78.0 | NaN | 41.1 | #### | 27.9 | NaN | 1.58 | -22.3 | 1.31 | -47.6 | 8176392 |

Dave's Daily Integration Meeting data plots

Stacking Rate



Vaia Papadimitriou

Recomputed Emittances

Recomputed Emittances Table

Shot Summary 3745 08/22/2004 13:20:22 Initial Stack size: 129.987

| Store # 3745 | Proton Vertical pi-mm-mr | Proton Horizontal pi-mm-mr | Proton Longitudinal eV-sec | Pbar Vertical pi-mm-mr | Pbar Horizontal pi-mm-mr | Pbar Longitudinal eV-sec |
|--|--------------------------------|----------------------------------|----------------------------------|------------------------------|--------------------------------|--------------------------------|
| Accumulator | . | . | . | 2.739 | 7.531 | 1.419 |
| MI 8 GeV | 11.004 | 12.266 | . | 8.744 | 4.719 | 1.158 |
| MI After Coalescing | . | . | . | . | . | . |
| MI 150 GeV | 11.682 | 12.318 | . | 7.725 | 7.514 | 2.347 |
| Proton Injection | -1.000 | -1.000 | 3.140 | . | . | . |
| Pbar Injection Porch | 17.471 | 18.601 | 3.120 | . | . | . |
| Pbar Injection | 18.514 | 19.645 | 3.090 | 10.596 | 12.964 | 3.368 |
| Before Ramp | 19.458 | 20.690 | 3.052 | 11.351 | 13.179 | 3.319 |
| Flattop | 17.952 | 22.107 | 3.460 | 10.543 | 13.198 | 3.279 |
| Squeeze | 13.684 | 21.016 | 3.457 | 9.687 | 15.601 | 2.803 |
| Initiate Collisions | 13.365 | 20.398 | 3.417 | 8.959 | 15.772 | 2.918 |
| Remove Halo - FW [Sync lite] | 13.578 [46.140] | 20.993 [53.674] | 3.485 | 9.935 [54.135] | 16.138 [162.476] | 2.758 |
| Begin of HEP - Sync lite | 46.282 | 53.435 | . | 57.291 | 168.392 | . |
| End of HEP - FW [Sync lite] | 21.906 [67.274] | 32.913 [69.885] | 5.753 | 14.085 [44.493] | 21.508 [74.723] | 3.750 |
| Eff. Emittance from Luminosities (from emittances) | 16.691 (14.774) | 16.691 (14.774) | . | . | . | . |
| Initial Lumosity | 62.807 | CDF | 59.657 | DZero | . | . |

[Security, Privacy, Legal](#)

[See how effective emittancies are computed](#)

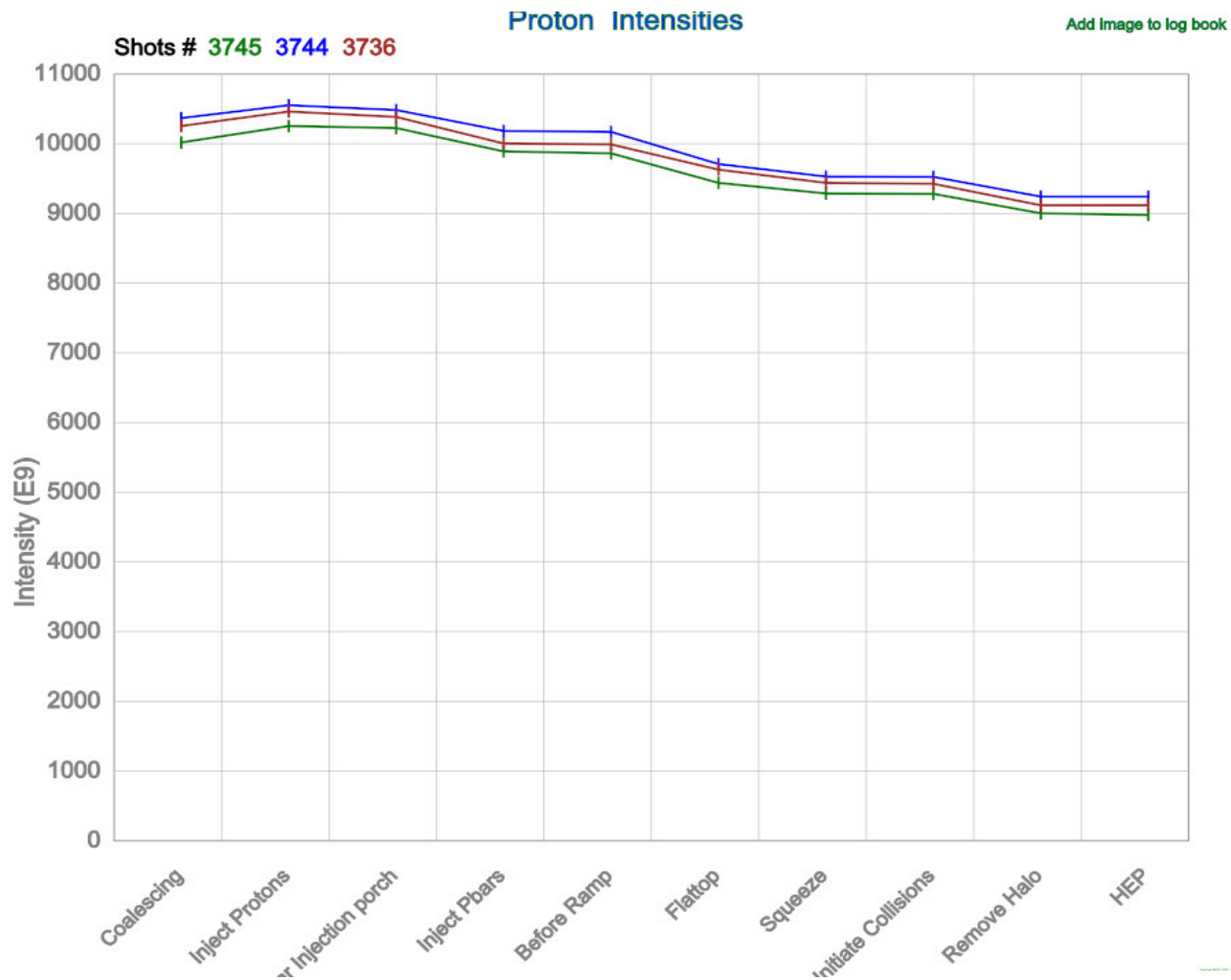
Intensities/Efficiencies

Shot Summary, store 3745, Sun Aug 22 13:20:36 CDT 2004, Initial Stack Size = 129.98749999999998 E10

| | Proton Intensity E9 | Step Efficiency % | Cumulative Efficiency % | Pbar Intensity E9 | Step Efficiency % | Cumulative Efficiency % |
|----------------------|---------------------|-------------------|-------------------------|-------------------|-------------------|-------------------------|
| Accumulator | | | | 1252.00 | | |
| MI 8Gev | 11613.47 | | | 6.15 | 0.49 | 0.49 |
| MI 150Gev | 11599.88 | 99.88 | 99.88 | 1134.54 | 18450.30 | 90.62 |
| Coalescing | 10019.01 | 86.37 | 86.27 | 1046.37 | 92.23 | 83.58 |
| Inject Protons | 10253.78 | 102.34 | 88.29 | | | |
| Pbar Injection porch | 10226.04 | 99.73 | 88.05 | | | |
| Inject Pbars | 9890.43 | 96.72 | 85.16 | 967.28 | 92.44 | 77.26 |
| Before Ramp | 9862.64 | 99.72 | 84.92 | 948.75 | 98.08 | 75.78 |
| Flattop | 9438.69 | 95.70 | 81.27 | 885.81 | 93.37 | 70.75 |
| Squeeze | 9286.72 | 98.39 | 79.97 | 847.47 | 95.67 | 67.69 |
| Initiate Collisions | 9281.67 | 99.95 | 79.92 | 835.90 | 98.63 | 66.76 |
| Remove Halo | 9002.48 | 96.99 | 77.52 | 817.63 | 97.82 | 65.31 |
| HEP | 8978.54 | 99.73 | 77.31 | 809.74 | 99.03 | 64.68 |
| Initial Luminosity | 62.81 | CDF | | 59.66 | DZero | |
| Shot Setup Time | 121.15 | min | | | | |

Vaia Papadimitriou

Intensities/Efficiencies



Vaia Papadimitriou

How do we track problems?

- ❖ Does the information exist in every column? Does it look reasonable? Is it consistent with numbers calculated by other methods?
- Beam condition issues
- Data acquisition problems
- Instrumentation problems
- Supertable rebuilding problems
- Osdaphysics software problems
- Datalogger issues

How do we track problems?

- ❖ Visual checking and follow up on issues on a daily basis (T.B & V.P) using SDAViewer and Datalogger Plotter.
- Store Checker
- Input from Jim Morgan, Dave McGinnis, the Machine Coordinators, Department Heads, SDA group.

We solve problems ...

- ❖ In collaboration with:
 - SDA group
 - Accelerator Controls Department
 - Instrumentation Department
 - Members of the Machine, Integration and Operations Departments

Supertable II

Why do we need it?

- ❖ To correctly compute **mixed source pbar stores** where the pbar bunches are injected from both the **Accumulator** and the **Recycler**. Need to track separately those bunches.
- ❖ To improve the program architecture, provide flexibility and make the support of the program easier.

Supertable II

- ❖ Supertable II was designed to be “backwards compatible” with the Supertable. Therefore it has all 142 Columns of the Supertable, plus 53 new Columns.
- ❖ Columns 143-195 handle information for pbar accounting, pbar intensities, pbar efficiencies and pbar emittances separately for **Accumulator** and **Recycler** bunches. (No separate lifetimes so far).

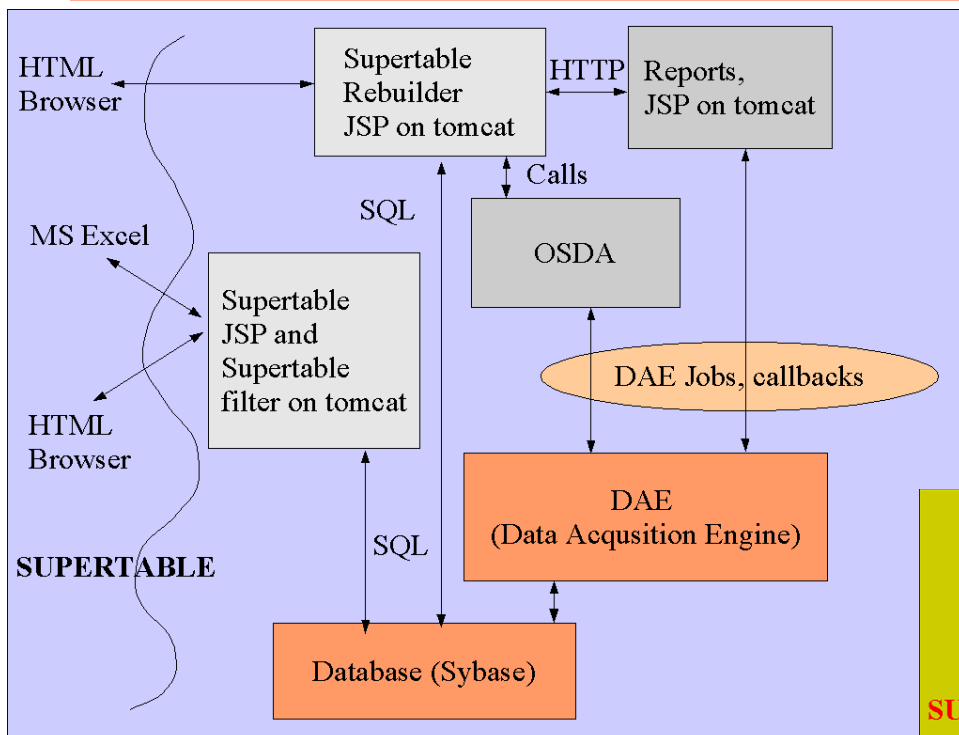
Supertable II

- ❖ The bunch is “tagged” by using the values of V:NPBSRC during different sets of the case “Inject Pbars” within “Collider Shot”. If the variable has the value of 1 (2), the transfer is from the Accumulator (Recycler).
- ❖ Weighted averages of the Accumulator and Recycler efficiencies are also formed.

Supertable II

| # 143 Start Recycler Stack | # 144 Recycler Unstacking Fraction | # 145 Recycler Amount Unstacked | # 146 Recycler Pbars at 150 | # 147 Accumulator Pbars at 150 | # 148 Recycler Pbars at Remove Halo | # 149 Accumulator Pbars at Remove Halo | # 150 Recycler Pbars at per bunch Remove Halo | # 151 Accumulator Pbars per bunch at Remove Halo | # 152 Average Recycler Horizontal Emittance | # 153 GeV Horizontal Recycler Pbar Emittance | # 154 GeV Horizontal Recycler Pbar Emittance | # 155 Before Ramp Horizontal Recycler Pbar Emittance | # 156 Flattop Horizontal Recycler Pbar Emittance | # 157 Remove Halo Horizontal Recycler Pbar Emittance | # 158 GeV Horizontal Accumulator Pbar Emittance |
|-------------------------------------|---|--|--------------------------------------|---|---|--|---|---|---|---|---|--|---|--|---|
| NaN | NaN | NaN | .00 | 953.00 | .00 | 817.63 | NaN | 22.71 | NaN | .00 | .00 | .00 | .00 | .00 | 4.72 |
| NaN | NaN | NaN | .00 | NaN | .00 | 950.48 | NaN | 26.40 | NaN | .00 | .00 | .00 | .00 | .00 | 6.12 |
| NaN | NaN | NaN | .00 | NaN | .00 | 1011.48 | NaN | 28.10 | NaN | .00 | .00 | .00 | .00 | .00 | 6.19 |
| NaN | NaN | NaN | .00 | 946.81 | .00 | 799.74 | NaN | 22.21 | NaN | .00 | .00 | .00 | .00 | .00 | 3.88 |
| .17 | -136.38 | -23.39 | 265.72 | NaN | 245.52 | 987.79 | 30.69 | 35.28 | 16.86 | 4.42 | 5.15 | 10.78 | 11.98 | 14.70 | 4.40 |
| 17.62 | .87 | 15.40 | 217.82 | NaN | 202.35 | 695.61 | 25.29 | 24.84 | 12.69 | 4.40 | 5.60 | 9.76 | 11.83 | 12.98 | 5.18 |
| NaN | NaN | NaN | .00 | 1301.03 | .00 | 1027.93 | NaN | 28.55 | NaN | .00 | .00 | .00 | .00 | .00 | 6.15 |
| NaN | NaN | NaN | .00 | 1007.61 | .00 | 863.15 | NaN | 23.98 | NaN | .00 | .00 | .00 | .00 | .00 | .00 |
| 24.34 | .60 | 14.70 | 256.88 | 614.40 | 245.01 | 572.24 | 30.63 | 20.44 | 16.73 | 4.08 | 4.55 | 8.87 | 11.48 | 14.16 | 2.49 |
| NaN | NaN | NaN | .00 | 1153.02 | .00 | 961.00 | NaN | 26.69 | NaN | .00 | .00 | .00 | .00 | .00 | 4.04 |
| NaN | NaN | NaN | .00 | NaN | .00 | 1072.95 | NaN | 29.80 | NaN | .00 | .00 | .00 | .00 | .00 | 4.65 |
| NaN | NaN | NaN | .00 | 1254.59 | .00 | 1057.52 | NaN | 29.38 | NaN | .00 | .00 | .00 | .00 | .00 | 5.79 |
| NaN | NaN | NaN | .00 | NaN | .00 | 1221.88 | NaN | 33.94 | NaN | .00 | .00 | .00 | .00 | .00 | 4.79 |
| NaN | NaN | NaN | .00 | 1220.91 | .00 | 1064.71 | NaN | 29.58 | NaN | .00 | .00 | .00 | .00 | .00 | 5.87 |
| NaN | NaN | NaN | .00 | NaN | .00 | 1215.64 | NaN | 33.77 | NaN | .00 | .00 | .00 | .00 | .00 | 6.85 |
| NaN | NaN | NaN | .00 | NaN | .00 | 1058.48 | NaN | 29.40 | NaN | .00 | .00 | .00 | .00 | .00 | 4.65 |
| 28.94 | .72 | 20.79 | 317.81 | 1262.30 | 278.08 | 1069.73 | 34.76 | 38.20 | 27.70 | 6.12 | 7.15 | 12.90 | 12.60 | 15.80 | 6.68 |
| 37.45 | .58 | 21.85 | 317.22 | 1133.79 | 298.74 | 982.51 | 37.34 | 35.09 | 28.06 | 4.25 | 5.06 | .00 | .00 | .00 | 4.77 |
| NaN | NaN | NaN | .00 | NaN | .00 | 1105.76 | NaN | 30.72 | NaN | .00 | .00 | .00 | .00 | .00 | 4.62 |
| NaN | NaN | NaN | .00 | NaN | .00 | 763.11 | NaN | 21.20 | NaN | .00 | .00 | .00 | .00 | .00 | 7.68 |
| 39.18 | .58 | 22.55 | 501.93 | 1317.75 | 460.92 | 1095.31 | 38.41 | 45.64 | 50.96 | 5.70 | 6.56 | 11.65 | 31.15 | 14.81 | 9.29 |

Supertable vs Supertable II - technical

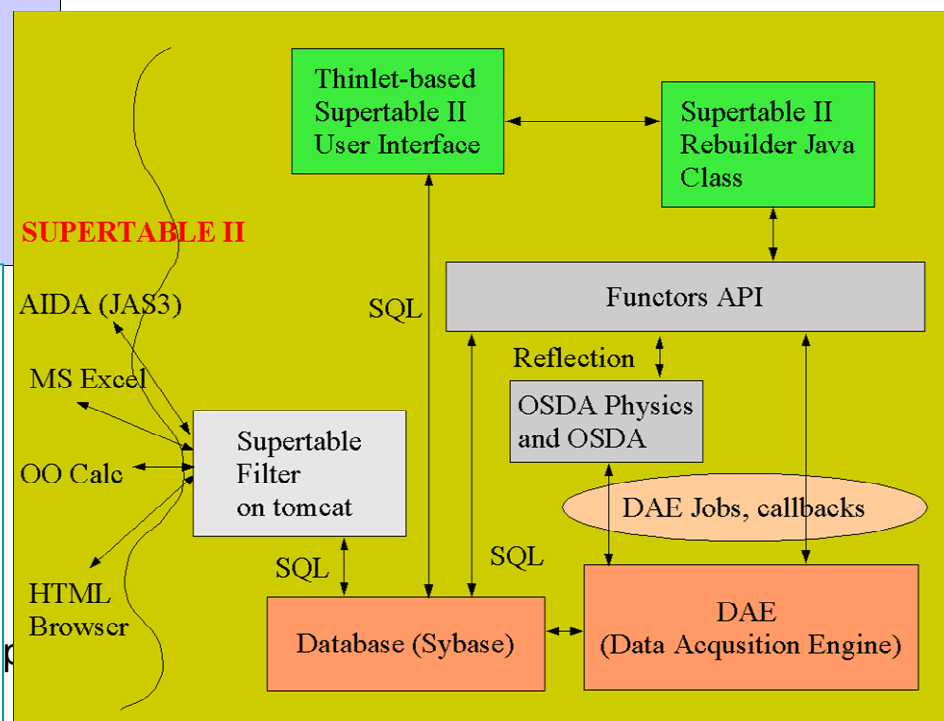


1) In Supertable II the Reports WEB application was substituted by the Functors API.

2) The Rebuilder is implemented as a Java class instead of JSP. More Flexible. WEB-startable version exists.

3) An internal Timer task is started in the user interface program for automatic rebuilding. This substitutes a cron job.

4) Database table format for saving cells was changed. Now each cell is stored independently.



Upcoming improvements and changes

- ❖ Use the **new** SBD for Tevatron intensities, efficiencies and lifetimes.
- ❖ Adding time dependent lattice information.
- ❖ Adding new columns (efficiencies based on both **sum** and **average** over sets as well as some new **weighted average** efficiencies).
- ❖ Reorganization of columns.
- ❖ Technical improvements on the accessibility of the information.

Supertable II

- ❖ We are currently supporting both versions of the Supertable.
- ❖ **SupertableII** will be the **default** after the end of the shutdown.

Thank you!!!

- Mike Church who started this effort
- **SDA group** (K. Genser, P. Lebrun, E. McCrory, S. Panacek, J. Slaughter)
- **Controls group** (K. Cahill, D. Finstrom, B.Hendricks, J. Patrick)
- **Instrumentation group** (N. Eddy, R. Flora, A.Ibrahim, R. Keup, E. Lorman, T. Meyer, S. Pordes, R. Weber)

Thank you!!!

- Members of the Machine, Integration and Operations **Departments**
(J. Annala, D. Capista, J. Crawford,
C. Gattuso, B. Hanna, A. Jansson, E. Harms,
W. Kissel, I. Kourbanis, V. Lebedev,
A. Marchionni, D. McGinnis, R. Moore,
J. Morgan, V. Shiltsev, D. Still, A. Tollestrup,
A. Xiao,...)

Conclusion

- It has been a very interesting experience to see a big group of people working together to keep the Supertable as accurate as possible, the official scorecard for every store.
- We appreciate a lot everybody's input, and we will continue needing it, especially during the transition period from Supertable to SupertableII.