Recomputing the Supertable and Emittance Minitables for stores 2658 – 3293 with supertable.jar version 1.7
Beams-doc-1099
Version 1.0

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Abstract

Stores 2658 (June 6, 2003) - 3293 (March 14, 2004) have been recomputed with supertable.jar version 1.7. This provides uniformity for all stores in the above range with respect to bugs that had been fixed, features that had been added and definitions of quantities that had been improved at some point during the above time period.

1.1 Backup

Before generating new versions of the Supertable and the Recomputed Emittance minitables we kept snap-shots of the old tables, the old source code and the old template showing the definitions of various quantities included in the Supertable. The old frozen version of the Supertable was dated February 27, 2004.

The above backup files are located in the area:
http://www-bd.fnal.gov/cgi-acc/cvsweb.cgi/tomcatroot/webapps/SDAMisc/SupertableBackup/

File
http://www-bd.fnal.gov/cgi-acc/cvsweb.cgi/tomcatroot/webapps/SDAMisc/SupertableBackup/
st_snap.xls

contains a snap-shot of the excel version of the Supertable before the rebuilt.

File
http://www-bd.fnal.gov/cgi-acc/cvsweb.cgi/tomcatroot/webapps/SDAMisc/SupertableBackup/
stbackup.zip

contains the files st_smap_2004_03_30_14_48.xls (snap-shot, identical to st_snap.xls), supertable.xml (the template, with definitions of the quantities presented in the Supertable), st_rebuilt.jsp (the source code), supertable.jar (the library of osda and osdaphysics classes).

File
http://www-bd.fnal.gov/cgi-acc/cvsweb.cgi/tomcatroot/webapps/SDAMisc/SupertableBackup/
RecomputedEmittances.zip

contains *.html files of the Recomputed Emittances for all stores.

1.2 Code used for the rebuilt, range of rebuilt stores

The Supertable and Recomputed Emittance minitables have been recomputed with supertable.jar version 1.7 which can be found in:
http://www-bd.fnal.gov/cgi-acc/cvsweb.cgi/tomcatroot/webapps/SDAMisc/WEB-INF/lib/
supertable.jar

We selected the range of stores 2658 (June 6, 2003) - 3293 (March 14, 2004) because
the Flying Wires were saturating before store 2658 and because the backup node was not working till some time in May, 2003.
We certainly wanted to have stores consistently calculated both before and after the September-November 2003 shutdown.

1.3 New features

We currently have 134 columns in total in the Supertable, 11 more than what we had
in the last frozen version of February 27, 2004. The new columns are 124-131 (vertical and
horizontal tunes and chromaticities for protons and pbars) and 132-134 (luminosity lifetimes for the
CDF and D0 experiments as well as an average of the luminosity lifetimes of the two experiments).

The definition of column 81 (pbar overall efficiency from Accumulator to HEP) changed from

0.1*"C:FBIANG[0]?Remove Halo:last"/(sum("A:IBEAMB?Transfer Pbars from Accum to MI:*") –
sum("A:IBEAM2?Transfer Pbars from Accum to MI:*"))
(where the sum is over all sets/transfers)

to

0.1*"C:FBIANG[0]?Remove Halo:last"/("A:IBEAMB?Inject Pbars:1" - "A:IBEAM2?Transfer
Pbars from Accum to MI:9").

The old and new definitions are in principle completely equivalent when no sets/transfers are
missing. With the new definition we are guarding against possible missing transfers.
The denominator of this quantity is now exactly the same as column 12, that is amount unstacked.

Various improvements in the class TeVEmittVarious.java were also propagated to all recomputed
stores. One important change in that class was the switching from devices SBDPSS and SBDASS to
SBDPWS and SBDAWS respectively for the calculation of the emittances.

A bug was fixed as well affecting the Pbar avg. efficiency at 150 GeV on the helix, column 97
in the Supertable.   Before the fix, bunches 34-36 were assumed to have all intensity equal to
FBIANG[33].

The format of the Supertable was improved as well. (For example units were added to several
quantities).

As far as the Recomputed Emittance minitables are concerned, a new feature has been added which
allows us to view the structure of the minitables (which classses/methods are used to compute the
emittances).

In the process of recomputing the Supertable for the above mentioned range of stores we also
corrected values of several quantities for stores 3261 and 3271 for which the SDA system had
crushed and many quantities in the Supertable were missing. This data was recovered from various
Data Loggers.

1.4 Supertable code location

 The Supertable source code is currently located at:

http://www-bd.fnal.gov/cgi-acc/cvsweb.cgi/tomcatroot/webapps/SDAMisc/st_rebuild.jsp

The Recomputed Emittance minitables' code is located at:

http://www-bd.fnal.gov/cgi-acc/cvsweb.cgi/gov/fnal/controls/applications/acctables/EmittancesTableBuilder.java

1.4 Pending Issues

An issue that was not resolved during the recomputation of the above mentioned range of stores is that we found differences between the pbar horizontal TeV emittance at 980 GeV, Flattop (column 47 in the Supertable) and the corresponding value in the Recomputed Emittances minitable in 4 stores (3293, 3247, 3172 and 3151). Because of the intermittency of the problem this issue has not been resolved yet. In store 3172 the value of the emittance was huge (over a thousand) in both files but different in the two files. For the other three stores the difference was in the range of (0.3-0.9) pi mm mrad.