"Longitudinal" Data in SDA

M Church
original 7/02/03
updated 7/21/03, updated 7/24/03, updated 8/29/03

Data included here are SBDs, miscellaneous RF parameters, and AP1 wall monitor.

Proton Data

Meaning	Bytes	Name	Case
1 for uncoalesced; 2 for coalesced protons	2	V:COALP	Proton Inj. Tuneup
1 for uncoalesced; 2 for coalesced protons	2	V:COALP	Eject Protons
# of Booster bunches selected	4	G:BNCH15	Inject Protons: B-MI
# of Booster turns selected	4	G:TURN15	Inject Protons: B-MI
Bunch length sigma at injection (central bunch is index 40)	52	I:SBD01S[35-47]	Inject Protons: B-MI
Bunch emittance at injection (central bunch is index 40)	52	I:SBD01E[35-47]	Inject Protons: B-MI
Bunch dp/p at injection (central bunch is index 40)	52	I:SBD01P[35-47]	Inject Protons: B-MI
Bunch length sigma @ 150GeV before coalescing (central bunch is index 40)	52	I:SBD02S[35-47]	Coalesce Protons
Bunch emittance @ 150GeV before coalescing (central bunch is index 40)	52	I:SBD02E[35-47]	Coalesce Protons
Bunch dp/p @ 150GeV before coalescing (central bunch is index 40)	52	I:SBD02P[35-47]	Coalesce Protons
Bunch length sigma @ 150GeV after coalescing (central bunch is index 40)	40	I:SBD03S[35-44]	Coalesce Protons
Bunch emittance @ 150GeV after coalescing (central bunch is index 40)	40	I:SBD03E[35-44]	Coalesce Protons
Bunch dp/p @ 150GeV after coalescing (central bunch is index 40)	40	I:SBD03P[35-47]	Coalesce Protons
Bunch length sigma @ 150GeV before injection (central bunch is index 40)	40	I:SBD04S[35-44]	Inject Protons
Bunch emittance @ 150GeV before injection (central bunch is index 40)	40	I:SBD04E[35-44]	Inject Protons
Bunch dp/p @ 150GeV before injection (central bunch is index 40)	40	I:SBD04P[35-47]	Inject Protons
RF voltage on proton cavities @ injection	2	T:RFSUM	Inject Protons
RF voltage on pbar cavities @ injection	2	T:RFSUMA	Inject Protons
Tev bunch centroid @ injection	148	T:SBDPCS[0-36]	Inject Protons
Tev bunch emittance @ injection	148	T:SBDPES[0-36]	Inject Protons
Tev bunch dp/p @ injection	148	T:SBDPPS[0-36]	Inject Protons
Tev bunch RMS sigma @ injection	148	T:SBDPSS[0-36]	Inject Protons
Tev bunch width @ injection	148	T:SBDPWS[0-36]	Inject Protons
Chi-squared of gaussian fit @ injection	148	T:SBDPDS[0-36]	Inject Protons
RF voltage on proton cavities after opening helix	2	T:RFSUM	Pbar Injection Porch
RF voltage on pbar cavities after opening helix	2	T:RFSUMA	Pbar Injection Porch
Tev bunch centroid at start of acceleration	148	T:SBDPCS[0-36]	Pbar Injection Porch
Tev bunch emittance at start of acceleration	148	T:SBDPES[0-36]	Pbar Injection Porch
Tev bunch dp/p at start of acceleration	148	T:SBDPPS[0-36]	Pbar Injection Porch
Tev bunch RMS sigma at start of acceleration	148	T:SBDPSS[0-36]	Pbar Injection Porch
Tev bunch width at start of acceleration	148	T:SBDPWS[0-36]	Pbar Injection Porch
Chi-squared of gaussian fit at start of acceleration	148	T:SBDPDS[0-36]	Pbar Injection Porch

RF voltage on proton cavities during pbar injection	2	T:RFSUM	Inject Pbars
RF voltage on pbar cavities during pbar injection	2	T:RFSUMA	Inject Pbars
Tev bunch centroid during pbar injection	148	T:SBDPCS[0-36]	Inject Pbars
Tev bunch emittance during pbar injection	148	T:SBDPES[0-36]	Inject Pbars
Tev bunch dp/p during pbar injection	148	T:SBDPPS[0-36]	Inject Pbars
Tev bunch RMS sigma during pbar injection	148	T:SBDPSS[0-36]	Inject Pbars
Tev bunch width during pbar injection	148	T:SBDPWS[0-36]	Inject Pbars
Chi-squared of gaussian fit during pbar injection	148	T:SBDPDS[0-36]	Inject Pbars
RF voltage on proton cavities before ramp	2	T:RFSUM	Before Ramp
RF voltage on pbar cavities before ramp	2	T:RFSUMA	Before Ramp
bunch centroid before ramp	148	T:SBDPCS[0-36]	Before Ramp
bunch emittance before ramp	148	T:SBDPES[0-36]	Before Ramp
bunch dp/p before ramp	148	T:SBDPPS[0-36]	Before Ramp
bunch RMS sigma before ramp	148	T:SBDPSS[0-36]	Before Ramp
bunch width before ramp	148	T:SBDPWS[0-36]	Before Ramp
Chi-squared of gaussian fit before ramp	148	T:SBDPDS[0-36]	Before Ramp
RF voltage on proton cavities at flattop start	2	T:RFSUM	Acceleration
RF voltage on pbar cavities at flattop start	2	T:RFSUMA	Acceleration
bunch centroid @ ~200GeV	148	T:SBDPCS[0-36]	Acceleration
bunch emittance @ ~200GeV	148	T:SBDPES[0-36]	Acceleration
bunch dp/p @ ~200GeV	148	T:SBDPPS[0-36]	Acceleration
bunch RMS sigma @ ~200GeV	148	T:SBDPSS[0-36]	Acceleration
bunch width @ ~200GeV	148	T:SBDPWS[0-36]	Acceleration
Chi-squared of gaussian fit @ ~200GeV	148	T:SBDPDS[0-36]	Acceleration
bunch centroid @ start of flattop	148	T:SBDPCS[0-36]	Flattop
bunch emittance @ start of flattop	148	T:SBDPES[0-36]	Flattop
bunch dp/p @ start of flattop	148	T:SBDPPS[0-36]	Flattop
bunch RMS sigma @ start of flattop	148	T:SBDPSS[0-36]	Flattop
bunch width @ start of flattop	148	T:SBDPWS[0-36]	Flattop
Chi-squared of gaussian fit @ start of flattop	148	T:SBDPDS[0-36]	Flattop
RF voltage on proton cavities at squeeze start	2	T:RFSUM	Squeeze
RF voltage on pbar cavities at squeeze start	2	T:RFSUMA	Squeeze
bunch centroid @ end of squeeze	148	T:SBDPCS[0-36]	Squeeze
bunch emittance @ end of squeeze	148	T:SBDPES[0-36]	Squeeze
bunch dp/p @ end of squeeze	148	T:SBDPPS[0-36]	Squeeze
bunch RMS sigma @ end of squeeze	148	T:SBDPSS[0-36]	Squeeze
bunch width @ end of squeeze	148	T:SBDPWS[0-36]	Squeeze
Chi-squared of gaussian fit @ end of squeeze	148	T:SBDPDS[0-36]	Squeeze
RF voltage on proton cavities at init. Coll. end	2	T:RFSUM	Initiate Collisions
RF voltage on pbar cavities at init. Coll. end	2	T:RFSUMA	Initiate Collisions
bunch centroid @ end of init. Coll.	148	T:SBDPCS[0-36]	Initiate Collisions
bunch emittance @ end of init. Coll.	148	T:SBDPES[0-36]	Initiate Collisions
bunch dp/p @ end of init. coll.	148	T:SBDPPS[0-36]	Initiate Collisions
bunch RMS sigma @ end of init. Coll.	148	T:SBDPSS[0-36]	Initiate Collisions
bunch width @ end of init. Coll.	148	T:SBDPWS[0-36]	Initiate Collisions
Chi-squared of gaussian fit @ end of Init. Coll.	148	T:SBDPDS[0-36]	Initiate Collisions
bunch centroid after scraping	148	T:SBDPCS[0-36]	Remove Halo
bunch emittance after scraping	148	T:SBDPES[0-36]	Remove Halo
bunch dp/p after scraping	148	T:SBDPPS[0-36]	Remove Halo
bunch RMS sigma after scraping	148	T:SBDPSS[0-36]	Remove Halo
bunch width after scraping	148	T:SBDPWS[0-36]	Remove Halo
Chi-squared of gaussian fit after scraping	148	T:SBDPDS[0-36]	Remove Halo
RF voltage on proton cavities	2	T:RFSUM	HEP
RF voltage on pbar cavities	2	T:RFSUMA	HEP
bunch centroid	148	T:SBDPCS[0-36]	HEP

bunch emittance	148	T:SBDPES[0-36]	HEP
bunch dp/p	148	T:SBDPPS[0-36]	HEP
bunch RMS sigma	148	T:SBDPSS[0-36]	HEP
bunch width	148	T:SBDPWS[0-36]	HEP
Chi-squared of gaussian fit	148	T:SBDPDS[0-36]	HEP
RF voltage on proton cavities	2	T:RFSUM	Pause HEP
RF voltage on pbar cavities	2	T:RFSUMA	Pause HEP
bunch centroid	148	T:SBDPCS[0-36]	Pause HEP
bunch emittance	148	T:SBDPES[0-36]	Pause HEP
bunch dp/p	148	T:SBDPPS[0-36]	Pause HEP
bunch RMS sigma	148	T:SBDPSS[0-36]	Pause HEP
bunch width	148	T:SBDPWS[0-36]	Pause HEP
Chi-squared of gaussian fit	148	T:SBDPDS[0-36]	Pause HEP

Pbar Data

Meaning	Bytes	Name	Case
Fraction of core requested for next shot	4	A:BMFRAC	Unstack Pbars
Center frequency of core before unstacking	4	A:CENFRQ	Unstack Pbars
Calculated lower frequency edge of beam	4	A:FLOWPC	Unstack Pbars
Calculated upper frequency edge of beam	4	A:FUPPC	Unstack Pbars
ARF1/ARF4 phase offset setting	2	A:R1LLPS	Unstack Pbars
ARF4 phase setting	4	A:R4CDPS	Unstack Pbars
ARF4 high level phase offset	4	A:R4HLPS	Unstack Pbars
ARF4 low level phase offset	4	A:R4LLPS	Unstack Pbars
ARF4-MI phase offset setting	4	A:R4MIPS	Unstack Pbars
RF H=1 DDS frequency before unstacking	2	A:RLLFS1	Unstack Pbars
MI llrf phase offset before unstacking	4	I:VATQFO	Unstack Pbars
Fraction of core requested for next shot	4	A:BMFRAC	Transfer Pbars from Acc-MI
Center frequency of core before unstacking	4	A:CENFRQ	Transfer Pbars from Acc-MI
Calculated lower frequency edge of beam	4	A:FLOWPC	Transfer Pbars from Acc-MI
Calculated upper frequency edge of beam	4	A:FUPPC	Transfer Pbars from Acc-MI
Core frequency width before unstacking	4	A:FRWDTH	Transfer Pbars from Acc-MI
Bucket area move setting	4	A:RCBKAM	Transfer Pbars from Acc-MI
Core momentum width before unstacking	4	A:SIGMAP	Transfer Pbars from Acc-MI
AP1 RWM ave. FWHM long. Emit	4	A:LE84	Transfer Pbars from Acc-MI
AP1 RWM batch 1 FWHM long. Emit	4	A:LE1-1	Transfer Pbars from Acc-MI
AP1 RWM batch 2 FWHM long. Emit	4	A:LE1-2	Transfer Pbars from Acc-MI
AP1 RWM batch 3 FWHM long. emit	4	A:LE1-3	Transfer Pbars from Acc-MI
AP1 RWM batch 4 FWHM long. emit	4	A:LE1-4	Transfer Pbars from Acc-MI
AP1 RWM ave. fit long. Emit	4	A:LE84FT	Transfer Pbars from Acc-MI
AP1 RWM batch 1 fit long. Emit	4	A:LE1FT1	Transfer Pbars from Acc-MI
AP1 RWM batch 2 fit long. Emit	4	A:LE1FT2	Transfer Pbars from Acc-MI
AP1 RWM batch 3 fit long. Emit	4	A:LE1FT3	Transfer Pbars from Acc-MI
AP1 RWM batch 4 fit long. Emit	4	A:LE1FT4	Transfer Pbars from Acc-MI
AP1 RWM ave. bunch length (@ 53MHz)	4	A:LE84BL	Transfer Pbars from Acc-MI
AP1 RWM ave. max long. Emit	4	A:LE84MX	Transfer Pbars from Acc-MI
AP1 RWM batch 1 max long. Emit	4	A:LE1MX1	Transfer Pbars from Acc-MI
AP1 RWM batch 2 max long. Emit	4	A:LE1MX2	Transfer Pbars from Acc-MI
AP1 RWM batch 3 max long. Emit	4	A:LE1MX3	Transfer Pbars from Acc-MI
AP1 RWM batch 4 max long. Emit	4	A:LE1MX4	Transfer Pbars from Acc-MI
AP1 RWM ave. FWHM long. Emit @ 2.5MHz	4	A:LE4	Transfer Pbars from Acc-MI
AP1 RWM batch 1 FWHM long. Emit @ 2.5MHz	4	A:LE4-1	Transfer Pbars from Acc-MI
AP1 RWM batch 2 FWHM long. Emit @ 2.5MHz	4	A:LE4-2	Transfer Pbars from Acc-MI
AP1 RWM batch 3 FWHM long. emit @ 2.5MHz	4	A:LE4-3	Transfer Pbars from Acc-MI
AP1 RWM batch 4 FWHM long. emit @ 2.5MHz	4	A:LE4-4	Transfer Pbars from Acc-MI
AP1 RWM ave. fit long. Emit @ 2.5MHz	4	A:LE4FIT	Transfer Pbars from Acc-MI
AP1 RWM batch 1 fit long. Emit @ 2.5MHz	4	A:LE4FT1	Transfer Pbars from Acc-MI
AP1 RWM batch 2 fit long. Emit @ 2.5MHz	4	A:LE4FT2	Transfer Pbars from Acc-MI
AP1 RWM batch 3 fit long. emit @ 2.5MHz	4	A:LE4FT3	Transfer Pbars from Acc-MI
AP1 RWM batch 4 fit long. emit @ 2.5MHz	4	A:LE4FT4	Transfer Pbars from Acc-MI
AP1 RWM ave. batch length @ 2.5MHz	4	A:LE4FIT	Transfer Pbars from Acc-MI
AP1 RWM batch 1 length @ 2.5MHz	4	A:LE4FT1	Transfer Pbars from Acc-MI
AP1 RWM batch 2 length @ 2.5MHz	4	A:LE4FT2	Transfer Pbars from Acc-MI
AP1 RWM batch 3 length @ 2.5MHz	4	A:LE4FT3	Transfer Pbars from Acc-MI
AP1 RWM batch 4 length @ 2.5MHz	4	A:LE4FT4	Transfer Pbars from Acc-MI
# 53MHz bunches total (reading and setting)	4	A:LE84N	Transfer Pbars from Acc-MI
# 53MHz bunches batch 1 (reading and setting)	4	A:LE84N1	Transfer Pbars from Acc-MI

# 53MHz bunches batch 2 (reading and setting)	4	A:LE84N2	Transfer Pbars from Acc-MI
# 53MHz bunches batch 3 (reading and setting)	4	A:L384N3	Transfer Pbars from Acc-MI
# 53MHz bunches batch 4 (reading and setting)	4	A:LE84N4	Transfer Pbars from Acc-MI
Accumulator bend field	4	A:BFIELD	Transfer Pbars from Acc-MI
VSA-measured long. emittance of core before ext.	4	A:VSALEM	Transfer Pbars from Acc-MI
VSA-requested long. Emittance to be extracted	4	A:VSALER	Transfer Pbars from Acc-MI
Bunch length sigma at injection (central bunches are indices 14,35,56,77)	360	I:SBD01S[0-89]	Inject Pbars
Bunch emittance at injection (central bunches are indices 14,35,56,77)	360	I:SBD01E[0-89]	Inject Pbars
Bunch dp/p at injection (central bunches are indices 14,35,56,77)	360	I:SBD01P[0-89]	Inject Pbars
Bunch length sigma @ 150GeV before coalescing (central bunches are indices 14,35,56,77)	360	I:SBD02S[0-89]	Inject Pbars
Bunch emittance @ 150GeV before coalescing (central bunches are indices 14,35,56,77)	360	I:SBD02E[0-89]	Inject Pbars
Bunch dp/p @ 150GeV before coalescing (central bunches are indices 14,35,56,77)	360	I:SBD02P[0-89]	Inject Pbars
Bunch length sigma @ 150GeV after coalescing (central bunches are indices 14,35,56,77)	360	I:SBD03S[0-89]	Inject Pbars
Bunch emittance @ 150GeV after coalescing (central bunches are indices 14,35,56,77)	360	I:SBD03E[0-89]	Inject Pbars
Bunch dp/p @ 150GeV after coalescing (central bunches are indices 14,35,56,77)	360	I:SBD03P[0-89]	Inject Pbars
Bunch length sigma @ 150GeV before injection (central bunches are indices 14,35,56,77)	360	I:SBD04S[0-89]	Inject Pbars
Bunch emittance @ 150GeV before injection (central bunches are indices 14,35,56,77)	360	I:SBD04E[0-89]	Inject Pbars
Bunch dp/p @ 150GeV before injection (central bunches are indices 14,35,56,77)	360	I:SBD04P[0-89]	Inject Pbars
Tev bunch centroid during pbar injection	148	T:SBDACS[0-36]	Inject Pbars
Tev bunch emittance during pbar injection	148	T:SBDAES[0-36]	Inject Pbars
Tev bunch dp/p during pbar injection	148	T:SBDAPS[0-36]	Inject Pbars
Tev bunch RMS sigma during pbar injection	148	T:SBDASS[0-36]	Inject Pbars
Tev bunch width during pbar injection	148	T:SBDAWS[0-36]	Inject Pbars
Chi-squared of gaussian fit during pbar injection	148	T:SBDADS[0-36]	Inject Pbars
bunch centroid before ramp	148	T:SBDACS[0-36]	Before Ramp
bunch emittance before ramp	148	T:SBDAES[0-36]	Before Ramp
bunch dp/p before ramp	148	T:SBDAPS[0-36]	Before Ramp
bunch RMS sigma before ramp	148	T:SBDASS[0-36]	Before Ramp
bunch width before ramp	148	T:SBDAWS[0-36]	Before Ramp
Chi-squared of gaussian fit before ramp	148	T:SBDADS[0-36]	Before Ramp
bunch centroid at start of acceleration	148	T:SBDACS[0-36]	Pbar Injection Porch
bunch emittance at start of acceleration	148	T:SBDAES[0-36]	Pbar Injection Porch
bunch dp/p at start of acceleration	148	T:SBDAPS[0-36]	Pbar Injection Porch
bunch RMS sigma at start of acceleration	148	T:SBDASS[0-36]	Pbar Injection Porch
bunch width at start of acceleration	148	T:SBDAWS[0-36]	Pbar Injection Porch
Chi-squared of gaussian fit at start of acceleration	148	T:SBDADS[0-36]	Pbar Injection Porch
bunch centroid @ ~200GeV	148	T:SBDACS[0-36]	Acceleration
bunch emittance @ ~200GeV	148	T:SBDAES[0-36]	Acceleration
bunch dp/p @ ~200GeV	148	T:SBDAPS[0-36]	Acceleration
bunch RMS sigma @ ~200GeV	148	T:SBDASS[0-36]	Acceleration
bunch width @ ~200GeV	148	T:SBDAWS[0-36]	Acceleration
Chi-squared of gaussian fit @ ~200GeV	148	T:SBDADS[0-36]	Acceleration
bunch centroid @ start of flattop	148	T:SBDACS[0-36]	Flattop

bunch emittance @ start of flattop	148	T:SBDAES[0-36]	Flattop
bunch dp/p @ start of flattop	148	T:SBDAPS[0-36]	Flattop
bunch RMS sigma @ start of flattop	148	T:SBDASS[0-36]	Flattop
bunch width @ start of flattop	148	T:SBDAWS[0-36]	Flattop
Chi-squared of gaussian fit @ start of flattop	148	T:SBDADS[0-36]	Flattop
bunch centroid @ end of squeeze	148	T:SBDACS[0-36]	Squeeze
bunch emittance @ end of squeeze	148	T:SBDAES[0-36]	Squeeze
bunch dp/p @ end of squeeze	148	T:SBDAPS[0-36]	Squeeze
bunch RMS sigma @ end of squeeze	148	T:SBDASS[0-36]	Squeeze
bunch width @ end of squeeze	148	T:SBDAWS[0-36]	Squeeze
Chi-squared of gaussian fit @ end of squeeze	148	T:SBDADS[0-36]	Squeeze
bunch centroid @ end of init. Coll.	148	T:SBDACS[0-36]	Initiate Collisions
bunch emittance @ end of init. Coll.	148	T:SBDAES[0-36]	Initiate Collisions
bunch dp/p @ end of init. Coll.	148	T:SBDAPS[0-36]	Initiate Collisions
bunch RMS sigma @ end of init. Coll.	148	T:SBDASS[0-36]	Initiate Collisions
bunch width @ end of init. Coll.	148	T:SBDAWS[0-36]	Initiate Collisions
Chi-squared of gaussian fit @ end of Init. Coll.	148	T:SBDADS[0-36]	Initiate Collisions
bunch centroid after scraping	148	T:SBDACS[0-36]	Remove Halo
bunch emittance after scraping	148	T:SBDAES[0-36]	Remove Halo
bunch dp/p after scraping	148	T:SBDAPS[0-36]	Remove Halo
bunch RMS sigma after scraping	148	T:SBDASS[0-36]	Remove Halo
bunch width after scraping	148	T:SBDAWS[0-36]	Remove Halo
Chi-squared of gaussian fit after scraping	148	T:SBDADS[0-36]	Remove Halo
bunch centroid	148	T:SBDACS[0-36]	HEP
bunch emittance	148	T:SBDAES[0-36]	HEP
bunch dp/p	148	T:SBDAPS[0-36]	HEP
bunch RMS sigma	148	T:SBDASS[0-36]	HEP
bunch width	148	T:SBDAWS[0-36]	HEP
Chi-squared of gaussian fit	148	T:SBDADS[0-36]	HEP
bunch centroid	148	T:SBDACS[0-36]	Pause HEP
bunch emittance	148	T:SBDAES[0-36]	Pause HEP
bunch dp/p	148	T:SBDAPS[0-36]	Pause HEP
bunch RMS sigma	148	T:SBDASS[0-36]	Pause HEP
bunch width	148	T:SBDAWS[0-36]	Pause HEP
Chi-squared of gaussian fit	148	T:SBDADS[0-36]	Pause HEP

The indices, *i* = pbar bunch # in the Tevatron (1-36), *j* = pbar shot # (1-9), and *k* = pbar batch # in the MI (1-4), are related in the following way:

i	**j**	**k**
1	1	1
2	1	2
3	1	3
4	1	4
5	4	1
6	4	2
7	4	3
8	4	4
9	7	1
10	7	2
11	7	3
12	7	4
13	2	1
14	2	2
15	2	3
16	2	4
17	5	1
18	5	2
19	5	3
20	5	4
21	8	1
22	8	2
23	8	3
24	8	4
25	3	1
26	3	2
27	3	3
28	3	4
29	6	1
30	6	2
31	6	3
32	6	4
33	9	1
34	9	2
35	9	3
36	9	4