BOTTOM, STRANGE MESONS ($B = \pm 1$, $S = \mp 1$)

$B_s^0 = s\overline{b}$, $\overline{B}_s^0 = \overline{s}\,b$, similarly for B_s^*'s

NODE=MXXX046

B_s^0

$I(J^P) = 0(0^-)$

NODE=S086

I, J, P need confirmation. Quantum numbers shown are quark-model predictions.

Mass $m_{B_s^0} = 5366.93 \pm 0.10$ MeV

NODE=S086M;DTYPE=M

$m_{B_s^0} - m_B = 87.37 \pm 0.12$ MeV

NODE=S086DM;DTYPE=D

Mean life $\tau = (1.520 \pm 0.005) \times 10^{-12}$ s

NODE=S086T;DTYPE=T;OUR EVAL; → UNCHECKED ←

$c\tau = 455.7$ μm

NODE=S086CTA;DTYPE=C;OUR EVAL

$\Delta\Gamma_{B_s^0} = \Gamma_{B_{sL}^0} - \Gamma_{B_{sH}^0} = (0.083 \pm 0.005) \times 10^{12}$ s^{-1} (S = 1.7)

NODE=S086DGS;DTYPE=w;OUR EVAL; → UNCHECKED ←

B_s^0-$\overline{B}_s^0$ mixing parameters

CLUMP=Y

$\Delta m_{B_s^0} = m_{B_{sH}^0} - m_{B_{sL}^0} = (17.765 \pm 0.006) \times 10^{12}$ $\hbar$ s^{-1}

$= (1.1693 \pm 0.0004) \times 10^{-8}$ MeV

NODE=S086D;DTYPE=y;CLUMP=Y;OUR EVAL;→ UNCHECKED ←

$x_s = \Delta m_{B_s^0}/\Gamma_{B_s^0} = 26.99 \pm 0.09$

NODE=S086D1;DTYPE=y;CLUMP=Y;OUR EVAL

χ_s (B_s^0-$\overline{B}_s^0$ mixing parameter) $= 0.499318 \pm 0.000005$

NODE=S086DG;DTYPE=y;CLUMP=Y;OUR EVAL;→ UNCHECKED ←

CP violation parameters in B_s^0

NODE=S086CHS;DTYPE=y;CLUMP=Y; OUR EVAL;→ UNCHECKED ←

CLUMP=C

$\mathrm{Re}(\epsilon_{B_s^0}) \,/\, (1 + |\epsilon_{B_s^0}|^2) = (-0.15 \pm 0.70) \times 10^{-3}$

NODE=S086EPS;DTYPE=v;CLUMP=C; OUR EVAL;→ UNCHECKED ←

$C_{KK}(B_s^0 \to\ K^+K^-) = 0.162 \pm 0.035$

NODE=S086CK1;DTYPE=v;CLUMP=C

$S_{KK}(B_s^0 \to\ K^+K^-) = 0.14 \pm 0.05$ (S = 1.3)

NODE=S086SK1;DTYPE=v;CLUMP=C

$\mathrm{r}_B(B_s^0 \to\ D_s^\mp K^\pm) = 0.37^{+0.10}_{-0.09}$

NODE=S086ARX;DTYPE=v;CLUMP=C

$\mathrm{r}_B(B_s^0 \to\ D_s^\mp K^\pm\pi^\pm\pi^\mp) = 0.47 \pm 0.08$

NODE=S086A28;DTYPE=v;CLUMP=C

$\delta_B(B_s^0 \to\ D_s^\pm K^\mp) = (358 \pm 14)^\circ$

NODE=S086DRX;DTYPE=v;CLUMP=C

$\delta_B(B_s^0 \to\ D_s^\pm K^\mp\pi^\pm\pi^\mp) = (-6^{+10}_{-13})^\circ$

NODE=S086A29;DTYPE=v;CLUMP=C

CP Violation phase $\beta_s = (2.5 \pm 1.0) \times 10^{-2}$ rad

NODE=S086PHS;DTYPE=v;CLUMP=C; OUR EVAL;→ UNCHECKED ←

$|\lambda|$ $(B_s^0 \to\ J/\psi(1S)\phi) = 0.990 \pm 0.010$

NODE=S086LJP;DTYPE=v;CLUMP=C;OUR EVAL;→ UNCHECKED ←

$|\lambda| = 1.002 \pm 0.009$

NODE=S086LAM;DTYPE=v;CLUMP=C

A, CP violation parameter $= -0.79 \pm 0.08$

NODE=S086JKA;DTYPE=v;CLUMP=C

C, CP violation parameter $= 0.19 \pm 0.06$

NODE=S086JKC;DTYPE=v;CLUMP=C

S, CP violation parameter $= 0.17 \pm 0.06$

NODE=S086JKS;DTYPE=v;CLUMP=C

$A_{CP}^L(B_s \to\ J/\psi\overline{K}^*(892)^0) = -0.05 \pm 0.06$

NODE=S086PK4;DTYPE=v;CLUMP=C

$A_{CP}^\parallel(B_s \to\ J/\psi\overline{K}^*(892)^0) = 0.17 \pm 0.15$

NODE=S086PK5;DTYPE=v;CLUMP=C

$A_{CP}^\perp(B_s \to\ J/\psi\overline{K}^*(892)^0) = -0.05 \pm 0.10$

NODE=S086PK6;DTYPE=v;CLUMP=C

$A_{CP}(B_s \to\ \pi^+K^-) = 0.224 \pm 0.012$

NODE=S086CP1;DTYPE=v;CLUMP=C

$A_{CP}(B_s^0 \to\ [K^+K^-]_D\overline{K}^*(892)^0) = -0.04 \pm 0.07$

NODE=S086CP2;DTYPE=v;CLUMP=C

$A_{CP}(B_s^0 \to\ [\pi^+K^-]_D K^*(892)^0) = -0.01 \pm 0.04$

NODE=S086CP3;DTYPE=v;CLUMP=C

$A_{CP}(B_s^0 \to\ [\pi^+\pi^-]_D K^*(892)^0) = 0.06 \pm 0.13$

NODE=S086CP4;DTYPE=v;CLUMP=C

$S(B_s^0 \to\ \phi\gamma) = 0.43 \pm 0.32$

NODE=S086A23;DTYPE=v;CLUMP=C

$C(B_s^0 \to\ \phi\gamma) = 0.11 \pm 0.31$

NODE=S086A24;DTYPE=v;CLUMP=C

$A^\Delta(B_s^0 \to\ \phi\gamma) = -0.7 \pm 0.4$

NODE=S086A07;DTYPE=v

$\Delta a_\perp < 1.2 \times 10^{-12}$ GeV, CL = 95%

NODE=S086CT1;DTYPE=t

$\Delta a_\parallel = (-0.9 \pm 1.5) \times 10^{-14}$ GeV

NODE=S086CT0;DTYPE=t

$\Delta a_X = (1.0 \pm 2.2) \times 10^{-14}$ GeV

NODE=S086A03;DTYPE=t

$\Delta a_Y = (-3.8 \pm 2.2) \times 10^{-14}$ GeV

NODE=S086A04;DTYPE=t

$\mathrm{Re}(\xi) = -0.022 \pm 0.033$

NODE=S086A00;DTYPE=t

$\mathrm{Im}(\xi) = 0.004 \pm 0.011$

NODE=S086A01;DTYPE=t

These branching fractions all scale with B($\overline{b} \rightarrow B_s^0$).

NODE=S086215;NODE=S086

The branching fraction B($B_s^0 \rightarrow D_s^- \ell^+ \nu_\ell$ anything) is not a pure measurement since the measured product branching fraction B($\overline{b} \rightarrow B_s^0$) × B($B_s^0 \rightarrow D_s^- \ell^+ \nu_\ell$ anything) was used to determine B($\overline{b} \rightarrow B_s^0$), as described in the note on "B^0-$\overline{B}^0$ Mixing"

For inclusive branching fractions, *e.g.*, $B \rightarrow D^\pm$ anything, the values usually are multiplicities, not branching fractions. They can be greater than one.

B_s^0 DECAY MODES		Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)	
D_s^- anything		(62 ± 6) %		–	DESIG=8
$D_s^\pm$ anything		(92 ±11) %		–	DESIG=175
D^0 / $\overline{D}^0$ anything		(38 ±10) %		–	DESIG=174
$\ell \nu_\ell X$		(9.6 ± 0.8) %		–	DESIG=49
$e^+ \nu X^-$		(9.1 ± 0.8) %		–	DESIG=98
$\mu^+ \nu X^-$		(10.2 ± 1.0) %		–	DESIG=99
$D_s^- \ell^+ \nu_\ell$ anything	[a]	(8.1 ± 1.3) %		–	DESIG=4
$D_s^{*-} \ell^+ \nu_\ell$ anything		(5.4 ± 1.1) %		–	DESIG=120
$D_s^- \mu^+ \nu_\mu$		(2.31± 0.21) %		2321	DESIG=150
$D_s^{*-} \mu^+ \nu_\mu$		(5.2 ± 0.5) %		2266	DESIG=151
$D_{s1}(2536)^- \mu^+ \nu_\mu$, $D_{s1}^- \rightarrow D^{*-} K_S^0$		(2.7 ± 0.7) × 10^{-3}		–	DESIG=36
$D_{s1}(2536)^- X \mu^+ \nu$, $D_{s1}^- \rightarrow \overline{D}^0 K^+$		(4.4 ± 1.3) × 10^{-3}		–	DESIG=46
$D_{s2}(2573)^- X \mu^+ \nu$, $D_{s2}^- \rightarrow \overline{D}^0 K^+$		(2.7 ± 1.0) × 10^{-3}		–	DESIG=47
$K^- \mu^+ \nu_\mu$		(1.06± 0.09) × 10^{-4}		2660	DESIG=154
$D_s^- \pi^+$		(2.98± 0.14) × 10^{-3}		2320	DESIG=5
$D_s^- \rho^+$		(6.8 ± 1.4) × 10^{-3}		2249	DESIG=39
$D_s^- \pi^+ \pi^+ \pi^-$		(6.1 ± 1.0) × 10^{-3}		2301	DESIG=32
$D_{s1}(2536)^- \pi^+$, $D_{s1}^- \rightarrow D_s^- \pi^+ \pi^-$		(2.4 ± 0.8) × 10^{-5}		–	DESIG=58
$D_s^\mp K^\pm$		(2.25± 0.12) × 10^{-4}		2293	DESIG=37
$D_{s1}(2536)^\mp K^\pm$, $D_{s1}^- \rightarrow \overline{D}^*(2007)^0 K^-$		(2.48± 0.28) × 10^{-5}		–	DESIG=180
$D_s^- K^+ \pi^+ \pi^-$		(3.2 ± 0.6) × 10^{-4}		2249	DESIG=57
$D_s^+ D_s^-$		(4.4 ± 0.5) × 10^{-3}		1824	DESIG=33
$D_s^- D^+$		(2.8 ± 0.5) × 10^{-4}		1875	DESIG=72
$D^+ D^-$		(2.2 ± 0.6) × 10^{-4}		1925	DESIG=73
$D^{*+} D^{*-}$		(2.14± 0.32) × 10^{-4}		1778	DESIG=177
$D^0 \overline{D}^0$		(1.9 ± 0.5) × 10^{-4}		1930	DESIG=74
$D_s^{*-} \pi^+$		(1.9 $^{+\ 0.5}_{-\ 0.4}$) × 10^{-3}		2265	DESIG=40
$D_s^{*\mp} K^\pm$		(1.32$^{+\ 0.40}_{-\ 0.32}$) × 10^{-4}		–	DESIG=113
$D_s^{*-} \rho^+$		(9.5 ± 2.0) × 10^{-3}		2191	DESIG=41
$D_s^{*+} D_s^- + D_s^{*-} D_s^+$		(1.39± 0.17) %		1742	DESIG=34
$D_s^{*+} D_s^{*-}$		(1.44± 0.21) %	S=1.1	1655	DESIG=35
$D_s^{(*)+} D_s^{(*)-}$		(4.5 ± 1.4) %		–	DESIG=24
$D^{*-} D_s^+$		(3.9 ± 0.8) × 10^{-4}		1801	DESIG=163
$\overline{D}^{*0} \overline{K}^0$		(2.8 ± 1.1) × 10^{-4}		2278	DESIG=123
$\overline{D}^0 \overline{K}^0$		(4.3 ± 0.9) × 10^{-4}		2330	DESIG=122
$\overline{D}^0 K^- \pi^+$		(1.04± 0.13) × 10^{-3}		2312	DESIG=65
$\overline{D}^*(2007)^0 K^- \pi^+$		(7.3 ± 2.6) × 10^{-4}		2259	DESIG=165
$\overline{D}^0 \overline{K}^*(892)^0$		(4.4 ± 0.6) × 10^{-4}		2264	DESIG=48
$\overline{D}^0 \overline{K}^*(1410)$		(3.9 ± 3.5) × 10^{-4}		2117	DESIG=84

$\overline{D}^0 \overline{K}_0^*(1430)$	$(3.0 \pm 0.7) \times 10^{-4}$		2113	DESIG=85
$\overline{D}^0 \overline{K}_2^*(1430)$	$(1.1 \pm 0.4) \times 10^{-4}$		2112	DESIG=86
$\overline{D}^0 \overline{K}^*(1680)$	$< 7.8 \times 10^{-5}$	CL=90%	1997	DESIG=87
$\overline{D}^0 \overline{K}_0^*(1950)$	$< 1.1 \times 10^{-4}$	CL=90%	1884	DESIG=88
$\overline{D}^0 \overline{K}_3^*(1780)$	$< 2.6 \times 10^{-5}$	CL=90%	1970	DESIG=89
$\overline{D}^0 \overline{K}_4^*(2045)$	$< 3.1 \times 10^{-5}$	CL=90%	1835	DESIG=90
$\overline{D}^0 K^- \pi^+$ (non-resonant)	$(2.1 \pm 0.8) \times 10^{-4}$		2312	DESIG=91
$D_{s2}^*(2573)^- \pi^+$, $D_{s2}^* \to \overline{D}^0 K^-$	$(2.6 \pm 0.4) \times 10^{-4}$		–	DESIG=92
$D_{s1}^*(2700)^- \pi^+$, $D_{s1}^* \to \overline{D}^0 K^-$	$(1.6 \pm 0.8) \times 10^{-5}$		–	DESIG=93
$D_{s1}^*(2860)^- \pi^+$, $D_{s1}^* \to \overline{D}^0 K^-$	$(5 \pm 4) \times 10^{-5}$		–	DESIG=94
$D_{s3}^*(2860)^- \pi^+$, $D_{s3}^* \to \overline{D}^0 K^-$	$(2.2 \pm 0.6) \times 10^{-5}$		–	DESIG=95
$\overline{D}^0 K^+ K^-$	$(5.6 \pm 0.9) \times 10^{-5}$		2243	DESIG=51
$\overline{D}^0 f_0(980)$	$< 3.1 \times 10^{-6}$	CL=90%	2242	DESIG=114
$\overline{D}^0 \phi$	$(2.30 \pm 0.25) \times 10^{-5}$		2235	DESIG=75
$\overline{D}^{*0} \phi$	$(3.2 \pm 0.4) \times 10^{-5}$		2178	DESIG=143
$D^{*\mp} \pi^{\pm}$	$< 6.1 \times 10^{-6}$	CL=90%	–	DESIG=70
$\eta_c \phi$	$(5.0 \pm 0.9) \times 10^{-4}$		1663	DESIG=131
$\eta_c \pi^+ \pi^-$	$(1.8 \pm 0.7) \times 10^{-4}$		1840	DESIG=132
$J/\psi(1S) \phi$	$(1.04 \pm 0.04) \times 10^{-3}$		1588	DESIG=7
$J/\psi(1S) \phi \phi$	$(1.20 ^{+ 0.14}_{- 0.16}) \times 10^{-5}$		764	DESIG=124
$J/\psi(1S) \pi^0$	$< 1.2 \times 10^{-3}$	CL=90%	1787	DESIG=21
$J/\psi(1S) \eta$	$(4.0 \pm 0.7) \times 10^{-4}$	S=1.4	1733	DESIG=22
$J/\psi(1S) K_S^0$	$(1.92 \pm 0.14) \times 10^{-5}$		1743	DESIG=44
$J/\psi(1S) \overline{K}^*(892)^0$	$(4.1 \pm 0.4) \times 10^{-5}$		1637	DESIG=45
$J/\psi(1S) \eta'$	$(3.3 \pm 0.4) \times 10^{-4}$		1612	DESIG=50
$J/\psi(1S) \pi^+ \pi^-$	$(2.02 \pm 0.17) \times 10^{-4}$	S=1.7	1775	DESIG=52
$J/\psi(1S) f_0(500)$, $f_0 \to \pi^+ \pi^-$	$< 4 \times 10^{-6}$	CL=90%	–	DESIG=101
$J/\psi(1S) \rho$, $\rho \to \pi^+ \pi^-$	$< 3.4 \times 10^{-6}$	CL=90%	–	DESIG=108
$J/\psi(1S) f_0(980)$, $f_0 \to \pi^+ \pi^-$	$(1.24 \pm 0.15) \times 10^{-4}$	S=2.1	–	DESIG=42
$J/\psi(1S) f_2(1270)$, $f_2 \to \pi^+ \pi^-$	$(1.0 \pm 0.4) \times 10^{-6}$		–	DESIG=53
$J/\psi(1S) f_2(1270)_0$, $f_2 \to \pi^+ \pi^-$	$(7.3 \pm 1.7) \times 10^{-7}$		–	DESIG=103
$J/\psi(1S) f_2(1270)_{\parallel}$, $f_2 \to \pi^+ \pi^-$	$(1.05 \pm 0.33) \times 10^{-6}$		–	DESIG=104
$J/\psi(1S) f_2(1270)_{\perp}$, $f_2 \to \pi^+ \pi^-$	$(1.3 \pm 0.7) \times 10^{-6}$		–	DESIG=105
$J/\psi(1S) f_0(1370)$, $f_0 \to \pi^+ \pi^-$	$(4.4 ^{+ 0.6}_{- 4.0}) \times 10^{-5}$		–	DESIG=43
$J/\psi(1S) f_0(1500)$, $f_0 \to \pi^+ \pi^-$	$(2.04 ^{+ 0.32}_{- 0.24}) \times 10^{-5}$		–	DESIG=106
$J/\psi(1S) f_2'(1525)_0$, $f_2' \to \pi^+ \pi^-$	$(1.03 \pm 0.22) \times 10^{-6}$		–	DESIG=107
$J/\psi(1S) f_2'(1525)_{\parallel}$, $f_2' \to \pi^+ \pi^-$	$(1.2 ^{+ 2.6}_{- 0.8}) \times 10^{-7}$		–	DESIG=109
$J/\psi(1S) f_2'(1525)_{\perp}$, $f_2' \to \pi^+ \pi^-$	$(5 \pm 4) \times 10^{-7}$		–	DESIG=110
$J/\psi(1S) f_0(1790)$, $f_0 \to \pi^+ \pi^-$	$(4.9 ^{+ 10.0}_{- 1.0}) \times 10^{-6}$		–	DESIG=111
$J/\psi(1S) \pi^+ \pi^-$ (nonresonant)	$(1.74 ^{+ 1.10}_{- 0.34}) \times 10^{-5}$		1775	DESIG=54
$J/\psi(1S) \overline{K}^0 \pi^+ \pi^-$	$< 4.4 \times 10^{-5}$	CL=90%	1675	DESIG=81

$J/\psi(1S)K^+K^-$	$(\ 7.9\ \pm\ 0.7\ )\times10^{-4}$		1601	DESIG=71
$J/\psi(1S)K^0K^-\pi^+$ + c.c.	$(\ 9.5\ \pm\ 1.3\ )\times10^{-4}$		1538	DESIG=79
$J/\psi(1S)\overline{K}^0K^+K^-$	$<\ 1.2\ \times10^{-5}$	CL=90%	1333	DESIG=80
$J/\psi K^*(892)^0\overline{K}^*(892)^0$	$(\ 1.10\pm\ 0.09)\times10^{-4}$		1083	DESIG=159
$J/\psi(1S)f_2'(1525)$	$(\ 2.6\ \pm\ 0.6\ )\times10^{-4}$		1310	DESIG=56
$J/\psi(1S)p\overline{p}$	$(\ 3.6\ \pm\ 0.4\ )\times10^{-6}$		982	DESIG=60
$J/\psi(1S)\gamma$	$<\ 7.3\ \times10^{-6}$	CL=90%	1790	DESIG=112
$J/\psi\mu^+\mu^-,\ J/\psi\to\ \mu^+\mu^-$	$<\ 2.6\ \times10^{-9}$	CL=95%	–	DESIG=168
$J/\psi(1S)\pi^+\pi^-\pi^+\pi^-$	$(\ 7.5\ \pm\ 0.8\ )\times10^{-5}$		1731	DESIG=77
$J/\psi(1S)f_1(1285)$	$(\ 7.2\ \pm\ 1.4\ )\times10^{-5}$		1460	DESIG=78
$\psi(2S)\eta$	$(\ 3.3\ \pm\ 0.9\ )\times10^{-4}$		1338	DESIG=66
$\psi(2S)\eta'$	$(\ 1.29\pm\ 0.35)\times10^{-4}$		1158	DESIG=100
$\psi(2S)\pi^+\pi^-$	$(\ 6.9\ \pm\ 1.2\ )\times10^{-5}$		1397	DESIG=67
$\psi(2S)\phi$	$(\ 5.3\ \pm\ 0.4\ )\times10^{-4}$		1120	DESIG=6
$\psi(2S)K^0$	$(\ 1.9\ \pm\ 0.5\ )\times10^{-5}$		1352	DESIG=166
$\psi(2S)K^-\pi^+$	$(\ 3.1\ \pm\ 0.4\ )\times10^{-5}$		1310	DESIG=118
$\psi(2S)\overline{K}^*(892)^0$	$(\ 3.3\ \pm\ 0.5\ )\times10^{-5}$		1196	DESIG=119
$\chi_{c1}\phi$	$(\ 1.97\pm\ 0.25)\times10^{-4}$		1275	DESIG=68
$\chi_{c1}(3872)\phi$	$(\ 1.22\pm\ 0.35)\times10^{-4}$		936	DESIG=152
$\chi_{c1}(3872)(K^+K^-)_{\ non-\phi}$	$(\ 9.4\ \pm\ 3.4\ )\times10^{-5}$		961	DESIG=160
$\chi_{c1}(3872)\pi^+\pi^-$	$(\ 4.6\ \pm\ 1.6\ )\times10^{-5}$		1264	DESIG=173
$\pi^+\pi^-$	$(\ 7.2\ \pm\ 1.0\ )\times10^{-7}$		2680	DESIG=16
$\pi^0\pi^0$	$<\ 7.7\ \times10^{-6}$	CL=90%	2680	DESIG=14
$\eta\pi^0$	$<\ 1.0\ \times10^{-3}$	CL=90%	2654	DESIG=13
$\eta\eta$	$<\ 1.43\ \times10^{-4}$	CL=90%	2627	DESIG=12
$\rho^0\rho^0$	$<\ 3.20\ \times10^{-4}$	CL=90%	2569	DESIG=25
$\eta' K_S^0$	$<\ 8.16\ \times10^{-6}$	CL=90%	2573	DESIG=169
$\eta'\eta$	$<\ 6.5\ \times10^{-5}$	CL=90%	2568	DESIG=153
$\eta'\eta'$	$(\ 3.3\ \pm\ 0.7\ )\times10^{-5}$		2507	DESIG=121
$\eta'\phi$	$<\ 8.2\ \times10^{-7}$	CL=90%	2495	DESIG=129
$\phi f_0(980),\ f_0(980)\to\ \pi^+\pi^-$	$(\ 1.12\pm\ 0.21)\times10^{-6}$		–	DESIG=126
$\phi f_2(1270),\ f_2(1270)\to\ \pi^+\pi^-$	$(\ 6.1\ {}^{+\ 1.8}_{-\ 1.5}\ )\times10^{-7}$		–	DESIG=127
$\phi\rho^0$	$(\ 2.7\ \pm\ 0.8\ )\times10^{-7}$		2526	DESIG=28
$\phi\pi^+\pi^-$	$(\ 3.5\ \pm\ 0.5\ )\times10^{-6}$		2579	DESIG=125
$\phi\phi$	$(\ 1.85\pm\ 0.14)\times10^{-5}$		2482	DESIG=30
$\phi\phi\phi$	$(\ 2.2\ \pm\ 0.6\ )\times10^{-6}$		2165	DESIG=136
π^+K^-	$(\ 5.9\ \pm\ 0.7\ )\times10^{-6}$		2659	DESIG=9
K^+K^-	$(\ 2.72\pm\ 0.23)\times10^{-5}$		2638	DESIG=10
$K^0\overline{K}^0$	$(\ 1.76\pm\ 0.31)\times10^{-5}$		2637	DESIG=38
$K^0\pi^+\pi^-$	$(\ 9.5\ \pm\ 2.1\ )\times10^{-6}$		2653	DESIG=61
$K^0K^\pm\pi^\mp$	$(\ 8.4\ \pm\ 0.9\ )\times10^{-5}$		2622	DESIG=62
$K^*(892)^-\pi^+$	$(\ 2.9\ \pm\ 1.1\ )\times10^{-6}$		2607	DESIG=96
$K^*(892)^\pm K^\mp$	$(\ 1.9\ \pm\ 0.5\ )\times10^{-5}$		2585	DESIG=97
$K_0^*(1430)^\pm K^\mp$	$(\ 3.1\ \pm\ 2.5\ )\times10^{-5}$		–	DESIG=144
$K_2^*(1430)^\pm K^\mp$	$(\ 1.0\ \pm\ 1.7\ )\times10^{-5}$		–	DESIG=145
$K^*(892)^0\overline{K}^0$ + c.c.	$(\ 2.0\ \pm\ 0.6\ )\times10^{-5}$		2585	DESIG=146
$K_0^*(1430)\overline{K}^0$ + c.c.	$(\ 3.3\ \pm\ 1.0\ )\times10^{-5}$		2468	DESIG=147
$K_2^*(1430)^0\overline{K}^0$ + c.c.	$(\ 1.7\ \pm\ 2.2\ )\times10^{-5}$		2467	DESIG=148
$K_S^0\overline{K}^*(892)^0$ + c.c.	$(\ 1.6\ \pm\ 0.4\ )\times10^{-5}$		2585	DESIG=115
$K^0K^+K^-$	$(\ 1.3\ \pm\ 0.6\ )\times10^{-6}$		2568	DESIG=63
$\overline{K}^*(892)^0\rho^0$	$<\ 7.67\ \times10^{-4}$	CL=90%	2550	DESIG=26
$\overline{K}^*(892)^0K^*(892)^0$	$(\ 1.11\pm\ 0.27)\times10^{-5}$		2531	DESIG=27
$\phi K^*(892)^0$	$(\ 1.14\pm\ 0.30)\times10^{-6}$		2507	DESIG=29
$p\overline{p}$	$<\ 4.4\ \times10^{-9}$	CL=90%	2514	DESIG=17
$p\overline{p}K^+K^-$	$(\ 4.5\ \pm\ 0.5\ )\times10^{-6}$		2231	DESIG=133
$p\overline{p}K^+\pi^-$	$(\ 1.39\pm\ 0.26)\times10^{-6}$		2355	DESIG=134
$p\overline{p}\pi^+\pi^-$	$(\ 4.3\ \pm\ 2.0\ )\times10^{-7}$		2454	DESIG=135
$p\overline{p}p\overline{p}$	$(\ 2.3\ \pm\ 1.0\ )\times10^{-8}$		1797	DESIG=178
$p\overline{\Lambda}K^-$ + c.c.	$(\ 5.5\ \pm\ 1.0\ )\times10^{-6}$		2358	DESIG=128
$\Lambda_c^-\Lambda\pi^+$	$(\ 3.6\ \pm\ 1.6\ )\times10^{-4}$		1979	DESIG=69
$\Lambda_c^-\Lambda_c^+$	$<\ 8.0\ \times10^{-5}$	CL=95%	1405	DESIG=76

Lepton Family number (*LF*) violating modes or $\Delta B = 1$ weak neutral current (*B1*) modes

NODE=S086;CLUMP=B

$\gamma\gamma$	*B1*		$< 3.1 \times 10^{-6}$	CL=90%	2683	DESIG=11
$\phi\gamma$	*B1*		$(3.4 \pm 0.4) \times 10^{-5}$		2587	DESIG=18
$\mu^+\mu^-$	*B1*		$(3.34 \pm 0.27) \times 10^{-9}$		2681	DESIG=15
e^+e^-	*B1*		$< 9.4 \times 10^{-9}$	CL=90%	2683	DESIG=20
$\tau^+\tau^-$	*B1*		$< 6.8 \times 10^{-3}$	CL=95%	2011	DESIG=130
$\mu^+\mu^-\gamma$	*B1*		$< 2.0 \times 10^{-9}$		2681	DESIG=170
$\mu^+\mu^-\mu^+\mu^-$	*B1*		$< 8.6 \times 10^{-10}$	CL=95%	2673	DESIG=59
$SP,\ S \to \mu^+\mu^-,\ P \to \mu^+\mu^-$	*B1*	[b]	$< 2.2 \times 10^{-9}$	CL=95%	–	DESIG=64
$aa,\ a \to \mu^+\mu^-$	*B1*		$< 5.8 \times 10^{-10}$	CL=95%	–	DESIG=167
$\phi(1020)\mu^+\mu^-$	*B1*		$(8.4 \pm 0.4) \times 10^{-7}$		2582	DESIG=31
$f_2'(1525)\mu^+\mu^-$	*B1*		$(1.62 \pm 0.22) \times 10^{-7}$		2464	DESIG=164
$\overline{K}^*(892)^0\mu^+\mu^-$	*B1*		$(2.9 \pm 1.1) \times 10^{-8}$		2605	DESIG=137
$\pi^+\pi^-\mu^+\mu^-$	*B1*		$(8.4 \pm 1.7) \times 10^{-8}$		2670	DESIG=117
$\phi\nu\overline{\nu}$	*B1*		$< 5.4 \times 10^{-3}$	CL=90%	2587	DESIG=19
$e^\pm\mu^\mp$	*LF*	[c]	$< 5.4 \times 10^{-9}$	CL=90%	2682	DESIG=23
$e^\pm\tau^\mp$	*LF*		$< 1.4 \times 10^{-3}$	CL=90%	2389	DESIG=171
$\mu^\pm\tau^\mp$	*LF*		$< 4.2 \times 10^{-5}$	CL=95%	2388	DESIG=149
$\phi\mu^\pm e^\mp$	*LF*		$< 1.6 \times 10^{-8}$	CL=90%	2586	DESIG=176
$p\mu^-$	*L,B*		$< 1.21 \times 10^{-8}$	CL=90%	2600	DESIG=179

B_s^*

$I(J^P) = 0(1^-)$

NODE=S087

I, *J*, *P* need confirmation. Quantum numbers shown are quark-model predictions.

Mass $m = 5415.4 \pm 1.4$ MeV (S = 2.6)

NODE=S087M;DTYPE=M

$m_{B_s^*} - m_{B_s} = 48.5 \pm 1.4$ MeV (S = 2.6)

NODE=S087DM;DTYPE=D

B_s^* DECAY MODES	Fraction (Γ_i/Γ)	*p* (MeV/*c*)	
$B_s\gamma$	seen	48	NODE=S087215;DESIG=1;OUR EST; → UNCHECKED ←

$B_{s1}(5830)^0$

$I(J^P) = 0(1^+)$
I, *J*, *P* need confirmation.

NODE=M187

Mass $m = 5828.73 \pm 0.20$ MeV

NODE=M187M;DTYPE=M

$m_{B_{s1}^0} - m_{B^{*+}} = 503.98 \pm 0.17$ MeV

NODE=M187DM;DTYPE=D

Full width $\Gamma = 0.5 \pm 0.4$ MeV

NODE=M187W;DTYPE=G

$B_{s1}(5830)^0$ DECAY MODES	Fraction (Γ_i/Γ)	*p* (MeV/*c*)	
$B^{*+}K^-$	seen	97	NODE=M187215;DESIG=1

$B_{s2}^*(5840)^0$

$I(J^P) = 0(2^+)$
I, *J*, *P* need confirmation.

NODE=M186

Mass $m = 5839.88 \pm 0.12$ MeV

NODE=M186M;DTYPE=M

$m_{B_{s2}^{*0}} - m_{B^+} = 560.48 \pm 0.12$ MeV

NODE=M186DM2;DTYPE=D

Full width $\Gamma = 1.49 \pm 0.27$ MeV

NODE=M186W;DTYPE=G

Branching fractions are given relative to the one **DEFINED AS 1**.

NODE=M186215;NODE=M186

$B_{s2}^*(5840)^0$ DECAY MODES	Fraction (Γ_i/Γ)	*p* (MeV/*c*)	
B^+K^-	**DEFINED AS 1**	252	DESIG=1
$B^{*+}K^-$	0.093 ± 0.018	141	DESIG=2
$B^0K_S^0$	0.43 ± 0.11	245	DESIG=4
$B^{*0}K_S^0$	0.04 ± 0.04	–	DESIG=3

NOTES

[*a*] Not a pure measurement. See note at head of B_s^0 Decay Modes. LINKAGE=X86

[*b*] Here S and P are the hypothetical scalar and pseudoscalar particles with masses of 2.5 GeV/c^2 and 214.3 MeV/c^2, respectively. LINKAGE=BSP

[*c*] The value is for the sum of the charge states or particle/antiparticle states indicated. LINKAGE=SG