BOTTOM, STRANGE MESONS ($B = \pm1$, $S = \mp1$)

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

B_s^0

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

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

Mass $m_{B_s^0} = 5367.5 \pm 1.8$ MeV (S = 1.1)
Mean life $\tau = (1.466 \pm 0.059) \times 10^{-12}$ s
$c\tau = 439$ μm

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

$\Delta m_{B_s^0} = m_{B_{sH}^0} - m_{B_{sL}^0} > 14.4 \times 10^{12}\ \hbar\ s^{-1}$, CL = 95%
$> 94.8 \times 10^{-10}$ MeV, CL = 95%
$x_s = \Delta m_{B_s^0}/\Gamma_{B_s^0} > 19.9$, CL = 95%
$\chi_s > 0.49878$, CL = 95%

These branching fractions all scale with B($\overline{b} \to B_s^0$), the LEP B_s^0 production fraction. The first four were evaluated using B($\overline{b} \to B_s^0$) = (10.7 ± 1.4)% and the rest assume B($\overline{b} \to B_s^0$) = 12%.

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

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

B_s^0 DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
D_s^- anything	(94 ± 30) %		–
$D_s^- \ell^+ \nu_\ell$ anything	[a] (7.9 ± 2.4) %		–
$D_s^- \pi^+$	< 13 %		2321
$D_s^{(*)+} D_s^{(*)-}$	(23^{+21}_{-13}) %		–
$J/\psi(1S)\phi$	$(9.3 \pm 3.3) \times 10^{-4}$		1588
$J/\psi(1S)\pi^0$	$< 1.2 \times 10^{-3}$	90%	1787
$J/\psi(1S)\eta$	$< 3.8 \times 10^{-3}$	90%	1734

$\psi(2S)\phi$			seen			1121
$\pi^+\pi^-$			< 1.7	$\times 10^{-4}$	90%	2680
$\pi^0\pi^0$			< 2.1	$\times 10^{-4}$	90%	2680
$\eta\pi^0$			< 1.0	$\times 10^{-3}$	90%	2654
$\eta\eta$			< 1.5	$\times 10^{-3}$	90%	2627
$\rho^0\rho^0$			< 3.20	$\times 10^{-4}$	90%	2569
$\phi\rho^0$			< 6.17	$\times 10^{-4}$	90%	2527
$\phi\phi$			(1.4 ± 0.8)	$\times 10^{-5}$		2483
π^+K^-			< 2.1	$\times 10^{-4}$	90%	2659
K^+K^-			< 5.9	$\times 10^{-5}$	90%	2638
$\overline{K}^*(892)^0\rho^0$			< 7.67	$\times 10^{-4}$	90%	2550
$\overline{K}^*(892)^0 K^*(892)^0$			< 1.681	$\times 10^{-3}$	90%	2531
$\phi K^*(892)^0$			< 1.013	$\times 10^{-3}$	90%	2507
$p\overline{p}$			< 5.9	$\times 10^{-5}$	90%	2514
$\gamma\gamma$	*B1*		< 1.48	$\times 10^{-4}$	90%	2684
$\phi\gamma$			< 1.2	$\times 10^{-4}$	90%	2587

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

$\mu^+\mu^-$	*B1*		< 1.5	$\times 10^{-7}$	90%	2682
e^+e^-	*B1*		< 5.4	$\times 10^{-5}$	90%	2684
$e^\pm\mu^\mp$	*LF*	[b]	< 6.1	$\times 10^{-6}$	90%	2683
$\phi(1020)\mu^+\mu^-$	*B1*		< 4.7	$\times 10^{-5}$	90%	2582
$\phi\nu\overline{\nu}$	*B1*		< 5.4	$\times 10^{-3}$	90%	2587

NOTES

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

[b] The value is for the sum of the charge states or particle/antiparticle states indicated.