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

B_s^0

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

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

Mass $m_{B_s^0} = 5369.6 \pm 2.4$ MeV

Mean life $\tau = (1.461 \pm 0.057) \times 10^{-12}$ s

$c\tau = 438\ \mu$m

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

$\Delta m_{B_s^0} = m_{B_{sH}^0} - m_{B_{sL}^0} > 14.4 \times 10^{12}\ \hbar\ \mathrm{s}^{-1}$, CL = 95%

$> 94.8 \times 10^{-10}$ MeV, CL = 95%

$x_s = \Delta m_{B_s^0}/\Gamma_{B_s^0} > 20.6$, CL = 95%

$\chi_s > 0.49883$, CL = 95%

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

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 "Production and Decay of b-Flavored Hadrons."

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)	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 %		2322
$D_s^{(*)+} D_s^{(*)-}$		(23 $^{+21}_{-13}$) %		–
$J/\psi(1S)\phi$		(9.3 ± 3.3) $\times 10^{-4}$		1590
$J/\psi(1S)\pi^0$		< 1.2 $\times 10^{-3}$	90%	1788
$J/\psi(1S)\eta$		< 3.8 $\times 10^{-3}$	90%	1735

$\psi(2S)\phi$			seen			1123
$\pi^+\pi^-$			< 1.7	$\times 10^{-4}$	90%	2681
$\pi^0\pi^0$			< 2.1	$\times 10^{-4}$	90%	2681
$\eta\pi^0$			< 1.0	$\times 10^{-3}$	90%	2655
$\eta\eta$			< 1.5	$\times 10^{-3}$	90%	2628
$\rho^0\rho^0$			< 3.20	$\times 10^{-4}$	90%	2570
$\phi\rho^0$			< 6.17	$\times 10^{-4}$	90%	2528
$\phi\phi$			< 1.183	$\times 10^{-3}$	90%	2484
π^+K^-			< 2.1	$\times 10^{-4}$	90%	2660
K^+K^-			< 5.9	$\times 10^{-5}$	90%	2639
$\overline{K}^*(892)^0\rho^0$			< 7.67	$\times 10^{-4}$	90%	2551
$\overline{K}^*(892)^0K^*(892)^0$			< 1.681	$\times 10^{-3}$	90%	2532
$\phi K^*(892)^0$			< 1.013	$\times 10^{-3}$	90%	2508
$p\overline{p}$			< 5.9	$\times 10^{-5}$	90%	2516
$\gamma\gamma$			< 1.48	$\times 10^{-4}$	90%	2685
$\phi\gamma$			< 1.2	$\times 10^{-4}$	90%	2588
Lepton Family number (*LF*) violating modes or $\Delta B = 1$ weak neutral current (*B1*) modes						
$\mu^+\mu^-$	*B1*		< 2.0	$\times 10^{-6}$	90%	2683
e^+e^-	*B1*		< 5.4	$\times 10^{-5}$	90%	2685
$e^\pm\mu^\mp$	*LF*	[*b*]	< 6.1	$\times 10^{-6}$	90%	2684
$\phi(1020)\mu^+\mu^-$	*B1*		< 4.7	$\times 10^{-5}$	90%	2584
$\phi\nu\overline{\nu}$	*B1*		< 5.4	$\times 10^{-3}$	90%	2588

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.