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

$c\tau = 438$ μm

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

$\Delta m_{B_s^0} = m_{B_{sH}^0} - m_{B_{sL}^0} > 13.1 \times 10^{12}$ $\hbar$ s^{-1}, CL = 95%

$x_s = \Delta m_{B_s^0} / \Gamma_{B_s^0} > 19.0$, CL = 95%

$\chi_s > 0.49862$, 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($\overline{b} \to B_s^0$) × 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 "Production and Decay of *b*-Flavored Hadrons."

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	[*iii*]	(7.9	$\pm$ 2.4) %		−
$D_s^- \pi^+$		< 13	%		2321
$D_s^{(*)+} D_s^{(*)-}$		(23	$^{+21}_{-13}$) %		−
$J/\psi(1S)\phi$		(9.3	$\pm$ 3.3) $\times 10^{-4}$		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			1122
$\pi^+ \pi^-$		< 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%	–
$\phi\rho^0$			< 6.17	$\times 10^{-4}$	90%	–
$\phi\phi$			< 1.183	$\times 10^{-3}$	90%	–
$\pi^+ K^-$			< 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%	–
$\overline{K}^*(892)^0 K^*(892)^0$			< 1.681	$\times 10^{-3}$	90%	–
$\phi K^*(892)^0$			< 1.013	$\times 10^{-3}$	90%	–
$p\overline{p}$			< 5.9	$\times 10^{-5}$	90%	2515
$\gamma\gamma$			< 1.48	$\times 10^{-4}$	90%	2685
$\phi\gamma$			< 7	$\times 10^{-4}$	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%	2682
$e^+ e^-$	*B1*		< 5.4	$\times 10^{-5}$	90%	2864
$e^{\pm}\mu^{\mp}$	*LF*	[*ff*] < 6.1		$\times 10^{-6}$	90%	2864
$\phi\nu\overline{\nu}$	*B1*		< 5.4	$\times 10^{-3}$	90%	–