

Heavy Flavor Averaging Group
August 2012

Compilation of B_s Rare Branching Fractions
All branching fractions are in units of 10^{-6}

In PDG2012		New since PDG2012 (preliminary)				New since PDG2012 (published)			
RPP#	Mode	PDG2012 Avg.	Belle	CDF	D0	LHCb	CMS	ATLAS	New Avg.
27	$\pi^+\pi^-$	< 1.2	< 12	$0.57 \pm 0.15 \pm 0.10$ †		$0.95^{+0.21}_{-0.17} \pm 0.13$			0.73 ± 0.14
33	$\phi\phi$	19^{+6}_{-5}		$19 \pm 3^{+5}_{-4}$ †					19 ± 5
34	π^+K^-	$5.3 \pm 0.9 \pm 0.4$	< 26	$5.3 \pm 0.9 \pm 0.4$ †		$5.4 \pm 0.4 \pm 0.6$ †			5.4 ± 0.6
35	K^+K^-	26.4 ± 2.8	$38^{+10}_{-9} \pm 7$	$25.8 \pm 2.2 \pm 1.7$ †		$23.0 \pm 0.7 \pm 2.3$			24.5 ± 1.8
36	$K^0\bar{K}^0$	< 66	< 66						< 66
–	$K^0\pi^+\pi^-$	New				$11.9 \pm 3.0 \pm 2.1$			11.9 ± 3.7
–	$K^0K^-\pi^+$	New				$97 \pm 7 \pm 11$			97 ± 13
–	$K^0K^+K^-$	New				$4.2 \pm 1.5 \pm 0.9$			4.2 ± 1.7
38	$K^{*0}\bar{K}^{*0}$	$28.1 \pm 4.6 \pm 5.6$				$28.1 \pm 4.6 \pm 5.6$			28.1 ± 7.2
41	$\gamma\gamma$	< 8.7	< 8.7						< 8.7
42	$\phi\gamma$	57^{+18+12}_{-15-11}	57^{+18+12}_{-15-11}			39 ± 5			40 ± 4
43	$\mu^+\mu^-$	< 0.0064		< 0.027†	< 0.042†	< 0.0038†	< 0.0064†	< 0.019†	< 0.0038†
44	e^+e^-	< 0.28		< 0.28†					< 0.28†
45	$e^\pm\mu^\mp$	< 0.20		< 0.20†					< 0.20†
–	$\mu^+\mu^-\mu^+\mu^-$	New				< 0.013			< 0.013
46	$\phi\mu^+\mu^-$	$1.23^{+0.40}_{-0.34}$		$1.17 \pm 0.18 \pm 0.37$ †	< 3.2 †	$0.78 \pm 0.10 \pm 0.28$ †			0.91 ± 0.24

†Relative BF converted to absolute BF

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Compilation of B_s Rare Relative Branching Fractions (UL 90% CL)

In PDG2012 New since PDG2012 (preliminary) New since PDG2012 (published)

RPP#	Mode	PDG2012 Avg.	CDF	D0	LHCb	New Avg.
27	$f_s \mathcal{B}(B_s^0 \rightarrow \pi^+ \pi^-) / f_d \mathcal{B}(B^0 \rightarrow K^+ \pi^-)$		0.008 ± 0.002 ± 0.001			0.008 ± 0.002
33	$\mathcal{B}(B_s^0 \rightarrow \phi \phi) / \mathcal{B}(B_s^0 \rightarrow J/\psi \phi)$		$(1.78 \pm 0.14 \pm 0.20) \times 10^{-2}$			1.78 ± 0.24
34	$f_s \mathcal{B}(B_s^0 \rightarrow K^+ \pi^-) / f_d \mathcal{B}(B_d^0 \rightarrow K^+ \pi^-)$		0.071 ± 0.010 ± 0.007		0.074 ± 0.006 ± 0.006	0.073 ± 0.007
35	$f_s \mathcal{B}(B_s^0 \rightarrow K^+ K^-) / f_d \mathcal{B}(B_d^0 \rightarrow K^+ \pi^-)$		0.347 ± 0.020 ± 0.021			0.347 ± 0.029
46	$\mathcal{B}(B_s^0 \rightarrow \phi \mu^+ \mu^-) / \mathcal{B}(B_s^0 \rightarrow J/\psi \phi) \times 10^3$		0.90 ± 0.14 ± 0.07	< 3.5	0.558 ± 0.070 ± 0.043	0.631 ± 0.073

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Partial Branching Fraction

In PDG2012 New since PDG2012 (preliminary) New since PDG2012 (published)

All branching fractions are in units of 10^{-7}

RPP#	Mode	q^2 [(GeV/c ²) ²] †	PDG2012 Avg.	CDF	LHCb	New Avg.
46	$\phi \mu^+ \mu^-$	< 2.0	2.78 ± 0.95 ± 0.89	3.16 ± 0.92 ± 1.00	0.81 ± 0.38	1.11 ± 0.35
	$\phi \mu^+ \mu^-$	[2.0, 4.3]	0.58 ± 0.55 ± 0.19	0.27 ± 0.41 ± 0.09	0.63 ± 0.34	0.50 ± 0.24
	$\phi \mu^+ \mu^-$	[4.3, 8.68]	1.34 ± 0.83 ± 0.43	0.64 ± 0.68 ± 0.20	1.34 ± 0.60	1.10 ± 0.41
	$\phi \mu^+ \mu^-$	[10.09, 12.86]	2.98 ± 0.95 ± 0.95	2.25 ± 0.69 ± 0.71	1.29 ± 0.59	1.72 ± 0.47
	$\phi \mu^+ \mu^-$	[14.18, 16.00]	1.86 ± 0.66 ± 0.59	1.11 ± 0.42 ± 0.35	1.32 ± 0.60	1.32 ± 0.37
	$\phi \mu^+ \mu^-$	> 16.00	2.32 ± 0.76 ± 0.74	2.31 ± 0.59 ± 0.73	1.47 ± 0.67	1.87 ± 0.49
	$\phi \mu^+ \mu^-$	[1.00, 6.00]	1.14 ± 0.79 ± 0.36	1.03 ± 0.70 ± 0.33	1.33 ± 0.38	1.25 ± 0.32

† see the original paper for the exact q^2 selection.

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