Heavy Flavor Averaging Group

April 2009

Compilation of B_s Rare Branching Fractions

All branching fractions are in units of 10^{-6}

In PDG2008 New since PDG2008 (preliminary) New since PDG2008 (published)

RPP#	Mode	PDG2008 Avg.	Belle	CDF	D0	New Avg.
13	$\pi^+\pi^-$	< 170		< 1.2		< 1.2
19	$\phi\phi$	14 ± 8		$14^{+6}_{-5} \pm 6$ †		14^{+8}_{-7}
20	π^+K^-	< 210		$5.0 \pm 0.7 \pm 0.8$		5.0 ± 1.1
21	K^+K^-	33 ± 9	< 310	$24.4 \pm 1.4 \pm 4.6$		24.4 ± 4.8
26	$\gamma\gamma$	< 5.3	< 8.7			< 8.7
27	$\phi\gamma$	< 120	57^{+18+12}_{-15-11}			57^{+21}_{-18}
28	$\mu^+\mu^-$	< 0.047		< 0.047	< 0.075	< 0.047
29	e^+e^-	< 54		< 0.28		< 0.28
30	$e^\pm\mu^\mp$	< 6.1		< 0.20		< 0.20
31	$\mu^+\mu^-\phi$	< 3.2		< 5.0	< 3.2 †	< 3.2 †

†Relative BF converted to absolute BF

Heavy Flavor Averaging Group
April 2009

Compilation of B_s^0 Rare Relative Branching Fractions (UL 90% CL)

In PDG2008 New since PDG2008 (preliminary) New since PDG2008 (published)

RPP#	Mode	PDG2008 Avg.	CDF	D0	New Avg.
9	$f_s\mathcal{B}(B_s^0 \to \pi^+\pi^-)/f_d\mathcal{B}(B^0 \to K^+\pi-)$		$0.007 \pm 0.004 \pm 0.005$		0.007 ± 0.006
15	$\mathcal{B}(B_s^0 \to \phi\phi)/\mathcal{B}(B_s^0 \to J/\psi\phi)$		$(10^{+5}_{-4} \pm 1) \times 10^{-3}$		10^{+7}_{-6}
16	$f_s\mathcal{B}(B_s^0 \to K^+\pi^-)/f_d\mathcal{B}(B_d^0 \to K^+\pi^-)$		$0.071 \pm 0.010 \pm 0.007$		0.071 ± 0.012
17	$f_s\mathcal{B}(B_s^0 \to K^+K^-)/f_d\mathcal{B}(B_d^0 \to K^+\pi^-)$		$0.324 \pm 0.019 \pm 0.041$		0.324 ± 0.045
27	$\mathcal{B}(B_s^0 \to \mu^+\mu^-\phi)/\mathcal{B}(B_s^0 \to J/\psi\phi)$		$< 2.3 \times 10^{-3}$	$< 3.5 \times 10^{-3}$	$< 2.3 \times 10^{-3}$

Charmless B_s Decays: CDF References

[1] CDF Collaboration (A. Aaltonen *et al.*), Phys. Rev. Lett. **100**, 101802 (2008).

[2] CDF Collaboration, (A. Aaltonen *et al.*), arXiv:0812.4271 (2008).

[3] CDF Collaboration, R. Harr, arXiv:0810.3444 (2008).

[4] CDF Collaboration, (A. Aaltonen *et al.*), Phys. Rev. D **79**, 011104 (2009).

[5] CDF Collaboration (D. Acosta *et al.*), Phys. Rev. Lett. **95**, 031801 (2005).

[6]

[7] CDF Collaboration, M. Morello, hep-ex/0612018 (Beauty 2006 contributed paper).

[8]

[9] DØ References

[10] DØ Collaboration (V. Abazov *et al.*), DØ Note 5344-CONF (2007).

[11] DØ Collaboration (V. Abazov *et al.*), Phys. Rev. D **74**, 031107 (2006).

[12]

[13]

[14]

[15]

[16]

[17]

[18]

[19] Belle References

[20] Belle Collaboration (A. Drutskoy *et al.*), Phys. Rev. D **76**, 012002 (2007).

[21] Belle Collaboration (J. Wicht *et al.*), Phys. Rev. Lett. **100**, 121801 (2008).