

Heavy Flavor Averaging Group

B^+ Branching Fractions (decays with kaons part 1) ($\times 10^6$) - April 2009. (UL 90% CL)
 In PDG2008 New since PDG2008 (preliminary) New since PDG2008 (published)

RPP#	Mode	PDG2008 Avg.	BABAR	Belle	CLEO	CDF	New avg.
207	$K^0\pi^+$	23.1 ± 1.0	$23.9 \pm 1.1 \pm 1.0$	$22.8_{-0.7}^{+0.8} \pm 1.3$	$18.8_{-3.3}^{+3.7+2.1}$		23.1 ± 1.0
208	$K^+\pi^0$	12.9 ± 0.6	$13.6 \pm 0.6 \pm 0.7$	$12.4 \pm 0.5 \pm 0.6$	$12.9_{-2.2}^{+2.4+1.2}$		12.9 ± 0.6
209	$\eta' K^+$	70.2 ± 2.5	$70.0 \pm 1.5 \pm 2.8$	$69.2 \pm 2.2 \pm 3.7$	$80_{-9}^{+10} \pm 7$		70.2 ± 2.5
210	$\eta' K^{*+}$	4.9 ± 2.0	$4.9_{-1.7}^{+1.9} \pm 0.8$	< 2.9	$11.1_{-8.0}^{+12.7}$		$4.9_{-1.9}^{+2.1}$
211	ηK^+	2.7 ± 0.9	$3.7 \pm 0.4 \pm 0.1$	$1.9 \pm 0.3_{-0.1}^{+0.2}$	$2.2_{-2.2}^{+2.8}$		2.7 ± 0.3
212	ηK^{*+}	19.3 ± 1.6	$18.9 \pm 1.8 \pm 1.3$	$19.3_{-1.9}^{+2.0} \pm 1.5$	$26.4_{-8.2}^{+9.6} \pm 3.3$		19.3 ± 1.6
213	$\eta K_0^*(1430)^+$	18 ± 4	$15.8 \pm 2.2 \pm 2.2$				15.8 ± 3.1
214	$\eta K_2^*(1430)^+$	9.1 ± 3.0	$9.1 \pm 2.7 \pm 1.4$				9.1 ± 3.0
-	$\eta(1295)K^+\dagger$	New	< 4.0				< 4.0
-	$\eta(1405)K^+\dagger$	New	< 1.2				< 1.2
-	$\eta(1475)K^+\dagger$	New	$13.8_{-1.7-0.6}^{+1.8+1.0}$				$13.8_{-1.8}^{+2.1}$
215	ωK^+	6.7 ± 0.8	$6.3 \pm 0.5 \pm 0.3$	$8.1 \pm 0.6 \pm 0.6$	$3.2_{-1.9}^{+2.4} \pm 0.8$		6.7 ± 0.5
216	ωK^{*+}	< 3.4	< 7.4		< 87		< 7.4
-	$\omega K_0^*(1430)^+$	New	$24.0 \pm 2.6 \pm 4.4$				24.0 ± 5.1
-	$\omega K_2^*(1430)^+$	New	$21.5 \pm 3.6 \pm 2.4$				21.5 ± 4.3
217	$a_0(980)^+ K^0 \dagger$	< 3.9	< 3.9				< 3.9
218	$a_0(980)^0 K^+ \dagger$	< 2.5	< 2.5				< 2.5
219	$K^{*0}\pi^+$	10.9 ± 1.8	$10.8 \pm 0.6_{-1.4}^{+1.2}$	$9.7 \pm 0.6_{-0.9}^{+0.8}$	$7.6_{-3.0}^{+3.5} \pm 1.6$		$9.9_{-0.9}^{+0.8}$
220	$K^{*+}\pi^0$	6.9 ± 2.4	$6.9 \pm 2.0 \pm 1.3$		$7.1_{-7.1}^{+11.4} \pm 1.0$		6.9 ± 2.3
221	$K^+\pi^+\pi^-$	55 ± 7	$54.4 \pm 1.1 \pm 4.6$	$48.8 \pm 1.1 \pm 3.6$			51.0 ± 3.0
222	$K^+\pi^+\pi^- (NR)$	6_{-4}^{+6}	$9.3 \pm 1.0_{-1.2}^{+6.8}$	$16.9 \pm 1.3_{-1.6}^{+1.7}$	< 28		16.3 ± 2.0
223	$f_0(980)K^+ \dagger$	$9.2_{-1.1}^{+0.8}$	$10.3 \pm 0.5_{-1.3}^{+2.0}$	$8.8 \pm 0.8_{-1.8}^{+0.9}$			9.5 ± 0.9
224	$f_2(1270)^0 K^+ \dagger$	$1.3_{-0.5}^{+0.4}$	$0.88 \pm 0.26_{-0.21}^{+0.26}$	$1.33 \pm 0.30_{-0.34}^{+0.23}$			$1.06_{-0.29}^{+0.28}$
225	$f_0(1370)^0 K^+ \dagger$	< 10.7	< 10.7				< 10.7
226	$\rho^0(1450)K^+$	< 11.7	< 11.7				< 11.7
227	$f_0(1500)K^+ \dagger$	< 4.4	$0.73 \pm 0.21 \pm 0.47$				0.73 ± 0.52
228	$f_2'(1525)K^+ \dagger$	< 3.4	< 3.4	< 4.9			< 3.4
229	$\rho^0 K^+$	4.2 ± 0.5	$3.56 \pm 0.45_{-0.46}^{+0.57}$	$3.89 \pm 0.47_{-0.41}^{+0.43}$	$8.4_{-3.4}^{+4.0} \pm 1.8$		$3.81_{-0.46}^{+0.48}$
230	$K_0^*(1430)^0 \pi^+$	47 ± 5	$32.0 \pm 1.2_{-6.0}^{+10.8}$	$51.6 \pm 1.7_{-7.4}^{+7.0}$			$45.2_{-6.3}^{+6.2}$
231	$K_2^*(1430)^0 \pi^+$	< 6.9	$5.6 \pm 1.2_{-0.8}^{+1.8}$	< 6.9			$5.6_{-1.4}^{+2.2}$
232	$K^*(1410)^0 \pi^+$	< 45	< 45	< 45			< 45
233	$K^*(1680)^0 \pi^+$	< 12	< 15	< 12			< 12
-	$f_1(1285)K^+$	New	< 2.0				< 2.0
-	$f_1(1420)K^+\dagger$	New	< 2.9				< 2.9
234	$K^-\pi^+\pi^+$	< 1.8	< 0.95	< 4.5			< 0.95
237	$K^0\pi^+\pi^0$	< 66			< 66		< 66
238	$\rho^+ K^0$	8.0 ± 1.5	$8.0_{-1.3}^{+1.4} \pm 0.6$		< 48		$8.0_{-1.4}^{+1.5}$
239	$K^{*+}\pi^+\pi^-$	75 ± 10	$75.3 \pm 6.0 \pm 8.1$				75.3 ± 10.1

†Product BF - daughter BF taken to be 100%;

Heavy Flavor Averaging Group

B^+ Branching Fractions (decays with kaons part 2) ($\times 10^6$) - April 2009. (UL 90% CL)
 In PDG2008 New since PDG2008 (preliminary) New since PDG2008 (published)

RPP#	Mode	PDG2008 Avg.	BABAR	Belle	CLEO	CDF	New avg.
240	$K^{*+}\rho^0$	< 6.1	< 6.1		< 74		< 6.1
241	$f_0(980)K^{*+} \dagger$	5.2 ± 1.3	$5.2 \pm 1.2 \pm 0.5$				5.2 ± 1.3
242	$a_1^+K^0$	35 ± 7	$34.9 \pm 5.0 \pm 4.4$				34.9 ± 6.7
243	$K^{*0}\rho^+$	9.2 ± 1.5	$9.6 \pm 1.7 \pm 1.5$	$8.9 \pm 1.7 \pm 1.2$			9.2 ± 1.5
244	$K^{*+}\bar{K}^{*0}$	< 71	$1.2 \pm 0.5 \pm 0.1$		< 71		1.2 ± 0.5
247	$K^+\bar{K}^0$	1.36 ± 0.27	$1.61 \pm 0.44 \pm 0.09$	$1.22^{+0.33+0.13}_{-0.28-0.16}$	< 3.3		$1.36^{+0.29}_{-0.27}$
248	$\bar{K}^0 K^+\pi^0$	< 24			< 24		< 24
249	$K^+K_S K_S$	11.5 ± 1.3	$10.7 \pm 1.2 \pm 1.0$	$13.4 \pm 1.9 \pm 1.5$			11.5 ± 1.3
250	$K_S K_S \pi^+$	< 3.2	< 0.51	< 3.2			< 0.51
251	$K^+K^-\pi^+$	5.0 ± 0.7	$5.0 \pm 0.5 \pm 0.5$	< 13			5.0 ± 0.7
253	$\bar{K}^{*0} K^+$	< 1.1	< 1.1		< 5.3		< 1.1
254	$\bar{K}_0^*(1430)^0 K^+$	< 2.2	< 2.2				< 2.2
–	$\bar{K}_2^*(1430)^0 K^+$	New					< 1.1
255	$K^+K^+\pi^-$	< 1.3	< 0.16	< 2.4			< 0.16
257	$b_1^0 K^+ \dagger$	9.1 ± 2.0	$9.1 \pm 1.7 \pm 1.0$				9.1 ± 2.0
–	$b_1^+ K^0 \dagger$	New	$9.6 \pm 1.7 \pm 0.9$				9.6 ± 1.9
259	$K^{*+}\pi^+K^-$	< 11.8	< 11.8				< 11.8
260	$K^{*+}K^+\pi^-$	< 6.1	< 6.1				< 6.1
261	$K^+K^-K^+$	33.7 ± 2.2	$33.5 \pm 0.9 \pm 1.6$	$30.6 \pm 1.2 \pm 2.3$			32.5 ± 1.5
262	ϕK^+	8.3 ± 0.7	$8.4 \pm 0.7 \pm 0.7$	$9.60 \pm 0.92^{+1.05}_{-0.84}$	$5.5^{+2.1}_{-1.8} \pm 0.6$	$7.6 \pm 1.3 \pm 0.6$	8.30 ± 0.65
264	$a_2(1320)K^+ \dagger$	< 1.1		< 1.1			< 1.1
267	$\phi(1680)K^+ \dagger$	< 0.8		< 0.8			< 0.8
270	$K^{*+}K^+K^-$	36 ± 5	$36.2 \pm 3.3 \pm 3.6$				36.2 ± 4.9
271	ϕK^{*+}	10.5 ± 1.5	$11.2 \pm 1.0 \pm 0.9$	$6.7^{+2.1+0.7}_{-1.9-1.0}$	$10.6^{+6.4+1.8}_{-4.9-1.6}$		10.0 ± 1.1
–	$\phi K_1(1270)^+$	New	$6.1 \pm 1.6 \pm 1.1$				6.1 ± 1.9
272	$\phi K_1(1400)^+$	< 1100	< 3.2				< 3.2
–	$\phi K_0^*(1430)^+$	New	$7.0 \pm 1.3 \pm 0.9$				7.0 ± 1.6
273	$\phi K_2^*(1430)^+$	< 3400	$8.4 \pm 1.8 \pm 1.0$				8.4 ± 2.1
–	$\phi K^*(1410)^+$	New	< 4.3				< 4.3
–	$\phi K_2(1770)^+$	New	< 15				< 15
–	$\phi K_2(1820)^+$	New	< 16				< 16
–	$\phi(1680)K^+ \dagger$	New	< 3.4				< 3.4
–	$a_1^+ K^{*0}$	New	< 3.3				< 3.3
274	$\phi\phi K^+ \S$	$4.9^{+2.4}_{-2.2}$	$7.5 \pm 1.0 \pm 0.7$	$3.2^{+0.6}_{-0.5} \pm 0.3$			4.2 ± 0.6
275	$\eta'\eta'K^+$	< 25	< 25				< 25

\dagger Product BF - daughter BF taken to be 100%; $\S M_{\phi\phi} < 2.85 \text{ GeV}/c^2$

Heavy Flavor Averaging Group
 B^+ Branching Fractions (decays without kaons) ($\times 10^6$) - April 2009. (UL 90%
CL)

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

RPP#	Mode	PDG2008 Avg.	BABAR	Belle	CLEO	CDF	New avg.
292	$\pi^+\pi^0$	5.7 ± 0.5	$5.02 \pm 0.46 \pm 0.29$	$6.5 \pm 0.4^{+0.4}_{-0.5}$	$4.6^{+1.8+0.6}_{-1.6-0.7}$		$5.59^{+0.41}_{-0.40}$
293	$\pi^+\pi^+\pi^-$	16.2 ± 1.5	$15.2 \pm 0.6 \pm 1.3$				15.2 ± 1.4
294	$\rho^0\pi^+$	8.7 ± 1.1	$8.1 \pm 0.7^{+1.3}_{-1.6}$	$8.0^{+2.3}_{-2.0} \pm 0.7$	$10.4^{+3.3}_{-3.4} \pm 2.1$		$8.3^{+1.2}_{-1.3}$
295	$f_0(980)\pi^+ \dagger$	< 3.0	< 1.5				< 1.5
296	$f_2(1270)\pi^+$	8.2 ± 2.5	$1.57 \pm 0.42^{+0.55}_{-0.25}$				$1.57^{+0.69}_{-0.49}$
297	$\rho(1450)^0\pi^+ \dagger$	< 2.3	$1.4 \pm 0.4^{+0.5}_{-0.8}$				$1.4^{+0.6}_{-0.9}$
298	$f_0(1370)\pi^+ \dagger$	< 3.0	< 4.0				< 4.0
300	$\pi^+\pi^-\pi^+(NR)$	< 4.6	$5.3 \pm 0.7^{+1.3}_{-0.8}$				$5.3^{+1.5}_{-1.1}$
302	$\rho^+\pi^0$	10.9 ± 1.4	$10.2 \pm 1.4 \pm 0.9$	$13.2 \pm 2.3^{+1.4}_{-1.9}$	< 43		$10.9^{+1.4}_{-1.5}$
304	$\rho^+\rho^0$	18 ± 4	$23.7 \pm 1.4 \pm 1.4$	$31.7 \pm 7.1^{+3.8}_{-6.7}$			$24.0^{+1.9}_{-2.0}$
305	$f_0(980)\rho^+ \dagger$	< 1.9	< 2.0				< 2.0
306	$a_1^+\pi^0$	26 ± 7	$26.4 \pm 5.4 \pm 4.1$				26.4 ± 6.8
307	$a_1^0\pi^+$	20 ± 6	$20.4 \pm 4.7 \pm 3.4$				20.4 ± 5.8
308	$b_1^0\pi^+ \dagger$	6.7 ± 2.0	$6.7 \pm 1.7 \pm 1.0$				6.7 ± 2.0
–	$b_1^+\pi^0 \dagger$	New	< 3.3				< 3.3
309	$\omega\pi^+$	6.9 ± 0.5	$6.7 \pm 0.5 \pm 0.4$	$6.9 \pm 0.6 \pm 0.5$	$11.3^{+3.3}_{-2.9} \pm 1.4$		6.9 ± 0.5
310	$\omega\rho^+$	$10.6^{+2.6}_{-2.3}$	$15.9 \pm 1.6 \pm 1.4$		< 61		15.9 ± 2.1
311	$\eta\pi^+$	4.4 ± 0.4	$5.0 \pm 0.5 \pm 0.3$	$4.2 \pm 0.4 \pm 0.2$	$1.2^{+2.8}_{-1.2}$		4.4 ± 0.4
312	$\eta'\pi^+$	2.7 ± 1.0	$3.9 \pm 0.7 \pm 0.3$	$1.8^{+0.7}_{-0.6} \pm 0.1$	$1.0^{+5.8}_{-1.0}$		$2.7^{+0.6}_{-0.5}$
313	$\eta'\rho^+$	$8.7^{+3.9}_{-3.1}$	$8.7^{+3.1+2.3}_{-2.8-1.3}$	< 5.8	$11.2^{+11.9}_{-7.0}$		$9.1^{+3.7}_{-2.8}$
314	$\eta\rho^+$	5.4 ± 1.9	$9.9 \pm 1.2 \pm 0.8$	$4.1^{+1.4}_{-1.3} \pm 0.4$	$4.8^{+5.2}_{-3.8}$		6.9 ± 1.0
315	$\phi\pi^+$	< 0.24	< 0.24		< 5		< 0.24
316	$\phi\rho^+$	< 16	< 3.0		< 16		< 3.0
317	$a_0(980)^0\pi^+ \dagger$	< 5.8	< 5.8				< 5.8
318	$a_0(980)^+\pi^0 \dagger$	< 1.4	< 1.4				< 1.4

†Product BF - daughter BF taken to be 100%;

Heavy Flavor Averaging Group

B^0 Branching Fractions (decays with kaons) ($\times 10^6$) - April 2009. (UL 90% CL)
 In PDG2008 New since PDG2008 (preliminary) New since PDG2008 (published)

RPP#	Mode	PDG2008 Avg.	BABAR	Belle	CLEO	CDF	New avg.
198	$K^+\pi^-$	19.5 ± 0.6	$19.1 \pm 0.6 \pm 0.6$	$19.9 \pm 0.4 \pm 0.8$	$18.0^{+2.3+1.2}_{-2.1-0.9}$		19.4 ± 0.6
199	$K^0\pi^0$	9.8 ± 0.6	$10.1 \pm 0.6 \pm 0.4$	$9.2 \pm 0.7^{+0.6}_{-0.7}$	$12.8^{+4.0+1.7}_{-3.3-1.4}$		9.8 ± 0.6
200	$\eta'K^0$	65 ± 4	$66.6 \pm 2.6 \pm 2.8$	$58.9^{+3.6}_{-3.5} \pm 4.3$	$89^{+18}_{-16} \pm 9$		64.9 ± 3.1
201	$\eta'K^{*0}$	3.8 ± 1.2	$3.8 \pm 1.1 \pm 0.5$	< 2.6	$7.8^{+7.7}_{-5.7}$		3.8 ± 1.2
202	ηK^0	< 1.9	$0.9^{+0.5}_{-0.4} \pm 0.1$	$1.1 \pm 0.4 \pm 0.1$	$0.0^{+3.0}_{-0.0}$		1.0 ± 0.3
203	ηK^{*0}	15.9 ± 1.0	$16.5 \pm 1.1 \pm 0.8$	$15.2 \pm 1.2 \pm 1.0$	$13.8^{+5.5}_{-4.6} \pm 1.6$		15.9 ± 1.0
204	$\eta K_0^*(1430)^0$	11.0 ± 2.2	$9.6 \pm 1.4 \pm 1.3$				9.6 ± 1.9
205	$\eta K_2^*(1430)^0$	9.6 ± 2.1	$9.6 \pm 1.8 \pm 1.1$				9.6 ± 2.1
206	ωK^0	5.0 ± 0.6	$5.4 \pm 0.8 \pm 0.3$	$4.4^{+0.8}_{-0.7} \pm 0.4$	$10.0^{+5.4}_{-4.2} \pm 1.4$		5.0 ± 0.6
207	$a_0(980)^0 K^0 \dagger$	< 7.8	< 7.8				< 7.8
208	$a_0(980)^- K^+ \dagger$	< 1.9	< 1.9				< 1.9
209	$a_0(1450)^- K^+ \dagger$	< 3.1	< 3.1				< 3.1
–	$\omega K^+\pi^- (NR)^3$	New		$5.1 \pm 0.7 \pm 0.7$			5.1 ± 1.0
211	ωK^{*0}	< 4.2	$2.2 \pm 0.6 \pm 0.2$	$1.8 \pm 0.7^{+0.3}_{-0.2}$	< 23		2.0 ± 0.5
–	$\omega K_0^*(1430)^0$	New	$16.0 \pm 1.6 \pm 3.0$				16.0 ± 3.4
–	$\omega K_2^*(1430)^0$	New	$10.1 \pm 2.0 \pm 1.1$				10.1 ± 2.3
212	K^+K^-	< 0.41	$0.04 \pm 0.15 \pm 0.08$	$0.09^{+0.18}_{-0.13} \pm 0.01$	< 0.8	$0.39 \pm 0.16 \pm 0.12 \ddagger$	$0.15^{+0.11}_{-0.10}$
213	$K^0\bar{K}^0$	$0.96^{+0.20}_{-0.18}$	$1.08 \pm 0.28 \pm 0.11$	$0.87^{+0.25}_{-0.20} \pm 0.09$	< 3.3		$0.96^{+0.21}_{-0.19}$
214	$K_S K_S K_S$	$6.2^{+1.2}_{-1.1}$	$6.9^{+0.9}_{-0.8} \pm 0.6$	$4.2^{+1.6}_{-1.3} \pm 0.8$			6.2 ± 0.9
215	$K_S K_S K_L$	< 16	$< 16^1$				$< 16^1$
216	$K^+\pi^-\pi^0$	37 ± 5	$35.7^{+2.6}_{-1.5} \pm 2.2$	$36.6^{+4.2}_{-4.3} \pm 3.0$	< 40		$35.9^{+2.9}_{-2.4}$
217	$\rho^- K^+$	8.5 ± 2.8	$8.0^{+0.8}_{-1.3} \pm 0.6$	$15.1^{+3.4+2.4}_{-3.3-2.6}$	$16^{+8}_{-6} \pm 3$		$8.6^{+0.9}_{-1.1}$
218	$K^+\pi^-\pi^0 (NR)$	< 9.4	$4.4 \pm 0.9 \pm 0.5$	< 9.4			4.4 ± 1.0
–	$\rho(1450)^- K^+$	New	< 2.1				< 2.1
–	$\rho(1700)^- K^+$	New	< 1.1				< 1.1
–	$K_0^*(1430)^0 \pi^0$	New	$11.7^{+1.4+4.0}_{-1.3-3.6} \text{ }^2$				$11.7^{+4.2}_{-3.8}$
–	$K_2^*(1430)^0 \pi^0$	New	< 4.0				< 4.0
–	$K^*(1680)^0 \pi^0$	New	< 7.5				< 7.5
220	$K^0 \pi^+ \pi^-$	44.8 ± 2.6	$43.0 \pm 2.3 \pm 2.3$	$47.5 \pm 2.4 \pm 3.7$	$50^{+10}_{-9} \pm 7$		$44.8^{+2.6}_{-2.5}$
222	$\rho^0 K^0$	5.9 ± 0.9	$4.9 \pm 0.8 \pm 0.9$	$6.1 \pm 1.0^{+1.1}_{-1.2}$	< 39		$5.4^{+0.9}_{-1.0}$
224	$K^{*+} \pi^-$	9.8 ± 1.3	$12.6^{+2.7}_{-1.6} \pm 0.9$	$8.4 \pm 1.1^{+1.0}_{-0.9}$	$16^{+6}_{-5} \pm 2$		10.3 ± 1.1
225	$K_0^*(1430)^+ \pi^-$	50^{+8}_{-9}	$25.4^{+3.0+6.1}_{-3.7-5.6} \text{ }^2$	$49.7 \pm 3.8^{+6.8}_{-8.2}$			34.2 ± 5.4
227	$K^*(1410)^+ \pi^- \dagger$	< 86	< 86	< 86			< 86
228	$K^*(1680)^+ \pi^-$	< 10.1	< 25	< 10.1			< 10.1
230	$f_0(980) K^0 \dagger$	$7.6^{+1.9}_{-2.1}$	$5.5 \pm 0.7 \pm 0.6$	$7.6 \pm 1.7^{+0.9}_{-1.3}$			$5.8^{+0.8}_{-0.9}$
231	$f_2(1270)^0 K^0 \dagger$	< 2.5		< 2.5			< 2.5
232	$K^{*0} \pi^0$	< 3.5	$3.6 \pm 0.7 \pm 0.4$	$0.4^{+1.9}_{-1.7} \pm 0.1$	$0.0^{+1.3+0.5}_{-0.0-0.0}$		2.4 ± 0.7
233	$K_2^*(1430)^+ \pi^-$	< 6.3	< 16.2	< 6.3			< 6.3
–	$K_1(1270)^+ \pi^-$	New	< 25.2				< 25.2
–	$K_1(1400)^+ \pi^-$	New	< 21.8				< 21.8
234	$K^0 K^- \pi^+$	< 18		< 18	< 21		< 18
235	$K^{*0} \bar{K}^0$	< 1.9	< 1.9				< 1.9
236	$K^+ K^- \pi^0$	< 19			< 19		< 19
237	$K^+ K^- K^0$	24.7 ± 2.3	$23.8 \pm 2.0 \pm 1.6$	$28.3 \pm 3.3 \pm 4.0$			24.7 ± 2.3
238	ϕK^0	$8.6^{+1.3}_{-1.1}$	$8.4^{+1.5}_{-1.3} \pm 0.5$	$9.0^{+2.2}_{-1.8} \pm 0.7$	$5.4^{+3.7}_{-2.7} \pm 0.7$		$8.3^{+1.2}_{-1.0}$
240	$K^{*0} \pi^+ \pi^-$	54 ± 5	$54.5 \pm 2.9 \pm 4.3$				54.5 ± 5.2
241	$K^{*0} \rho^0$	5.6 ± 1.6	$5.6 \pm 0.9 \pm 1.3$		< 34		5.6 ± 1.6
242	$f_0(980) K^{*0} \dagger$	< 4.3	< 4.3				< 4.3
244	$a_1^- K^+$	16 ± 4	$16.3 \pm 2.9 \pm 2.3$				16.3 ± 3.7
245	$b_1^- K^+ \dagger$	7.4 ± 1.4	$7.4 \pm 1.0 \pm 1.0$				7.4 ± 1.4
–	$b_1^0 K^0 \dagger$	New	< 7.8				< 7.8
246	$K^{*0} K^+ K^-$	27.5 ± 2.6	$27.5 \pm 1.3 \pm 2.2$				27.5 ± 2.6
247	ϕK^{*0}	9.5 ± 0.8	$9.7 \pm 0.5 \pm 0.6$	$10.0^{+1.6+0.7}_{-1.5-0.8}$	$11.5^{+4.5+1.8}_{-3.7-1.7}$		9.8 ± 0.7
248	$K^{*0} \pi^+ K^-$	4.6 ± 1.4	$4.6 \pm 1.1 \pm 0.8$				4.6 ± 1.4
249	$K^{*0} \bar{K}^{*0}$	$1.28^{+0.37}_{-0.32}$	$1.28^{+0.35}_{-0.30} \pm 0.11$		< 22		$1.28^{+0.37}_{-0.32}$
250	$K^{*0} K^+ \pi^-$	< 2.2	< 2.2				< 2.2
251	$K^{*0} K^{*0}$	< 0.41	< 0.41		< 37		< 0.41
252	$K^{*+} \rho^-$	< 12	< 12				< 12
253	$K^{*+} K^{*-}$	< 141	< 2.0		< 141		< 2.0
258	$\phi K_0^*(1430)^0$	4.6 ± 0.9	$3.9 \pm 0.5 \pm 0.5$				3.9 ± 0.7
259	$\phi K^*(1680)^0$	< 3.5	< 3.5				< 3.5
260	$\phi K_3^*(1780)^0$	< 2.7	< 2.7				< 2.7
261	$\phi K_4^*(2045)^0$	< 15.3	< 15.3				< 15.3
263	$\phi K_2^*(1430)^0$	7.8 ± 1.3	$7.5 \pm 0.9 \pm 0.5$				7.5 ± 1.0
264	$\phi \phi K^0 \S$	$4.1^{+1.7}_{-1.4} \pm 0.4$	$4.1^{+1.7}_{-1.4} \pm 0.4$	$2.3^{+1.0}_{-0.7} \pm 0.2$			$2.8^{+0.9}_{-0.7}$
266	$\eta' \eta' K^0$	< 31	< 31				< 31

\dagger Product BF - daughter BF taken to be 100%, \ddagger Relative BF converted to absolute BF $\S M_{\phi\phi} < 2.85$ GeV/ c^2 1 Excludes $M(K_S K_S)$ regions [3.400,3.429] and [3.540,3.585] and $M(K_S K_L) < 1.049$ GeV/ c^2 2 Includes $K\pi$ S-wave contribution and uncorrected for $K^*(1430)$ BF. $^3 0.755 < M(K\pi) < 1.250$ GeV/ c^2

Heavy Flavor Averaging Group

B^0 Branching Fractions (decays without kaons) ($\times 10^6$) - April 2009. (UL 90% CL)
 In PDG2008 New since PDG2008 (preliminary) New since PDG2008 (published)

RPP#	Mode	PDG2008 Avg.	BABAR	Belle	CLEO	CDF	New avg.
284	$\pi^+\pi^-$	5.13 ± 0.24	$5.5 \pm 0.4 \pm 0.3$	$5.1 \pm 0.2 \pm 0.2$	$4.5^{+1.4+0.5}_{-1.2-0.4}$	$5.10 \pm 0.33 \pm 0.36$ ‡	5.16 ± 0.22
285	$\pi^0\pi^0$	1.62 ± 0.31	$1.83 \pm 0.21 \pm 0.13$	$1.1 \pm 0.3 \pm 0.1$	< 4.4		1.55 ± 0.19
286	$\eta\pi^0$	< 1.3	< 1.5	< 2.5	< 2.9		< 1.5
287	$\eta\eta$	< 1.8	< 1.4	< 2.0	< 18		< 1.4
288	$\eta'\pi^0$	$1.5^{+1.0}_{-0.8}$	$0.9 \pm 0.4 \pm 0.1$	$2.8 \pm 1.0 \pm 0.3$	$0.0^{+1.8}_{-0.0}$		1.2 ± 0.4
289	$\eta'\eta'$	< 2.4	< 2.1	< 6.5	< 47		< 2.1
290	$\eta'\eta$	< 1.7	< 1.2	< 4.5	< 27		< 1.2
291	$\eta'\rho^0$	< 1.3	< 3.7	< 1.3	< 12		< 1.3
292	$f_0(980)\eta' \dagger$	< 1.5	< 1.5				< 1.5
293	$\eta\rho^0$	< 1.5	< 1.5	< 1.9	< 10		< 1.5
294	$f_0(980)\eta \dagger$	< 1.6	< 0.4				< 0.4
295	$\omega\eta$	< 1.9	< 1.6		< 12		< 1.6
296	$\omega\eta'$	< 2.8	< 1.7	< 2.2	< 60		< 1.7
297	$\omega\rho^0$	< 1.5	< 1.6		< 11		< 1.6
298	$f_0(980)\omega \dagger$	< 1.5	< 1.5				< 1.5
299	$\omega\omega$	< 4.0	< 4.0		< 19		< 4.0
300	$\phi\pi^0$	< 0.28	< 0.28		< 5		< 0.28
301	$\phi\eta$	< 0.6	< 0.52		< 9		< 0.52
302	$\phi\eta'$	< 0.5	< 1.2	< 0.5	< 31		< 0.5
303	$\phi\rho^0$	< 13	< 0.33		< 13		< 0.33
—	$f_0(980)\phi \dagger$	New	< 0.38				< 0.38
304	$\omega\phi$	< 1.2	< 1.2		< 21		< 1.2
305	$\phi\phi$	< 1.5	< 0.2		< 12		< 0.2
306	$a_0^\mp(980)\pi^\pm \dagger$	< 3.1	< 3.1				< 3.1
307	$a_0^\mp(1450)\pi^\pm \dagger$	2.3	< 2.3				< 2.3
309	$\rho^0\pi^0$	1.8 ± 0.5	$1.4 \pm 0.6 \pm 0.3$	$3.0 \pm 0.5 \pm 0.7$	$1.6^{+2.0}_{-1.4} \pm 0.8$		2.0 ± 0.5
310	$\rho^\mp\pi^\pm$	22.8 ± 2.5	$22.6 \pm 1.8 \pm 2.2$	$22.6 \pm 1.1 \pm 4.4$	$27.6^{+8.4}_{-7.4} \pm 4.2$		23.0 ± 2.3
311	$\pi^+\pi^-\pi^+\pi^-$	< 230	< 21.1	< 19.3			< 19.3
312	$\rho^0\rho^0$	1.1 ± 0.4	$0.92 \pm 0.32 \pm 0.14$	$0.4 \pm 0.4^{+0.2}_{-0.3}$	< 18		$0.73^{+0.27}_{-0.28}$
—	$\rho^0\pi^+\pi^-(NR)$	New	< 8.7	< 12			< 8.7
—	$f_0(980)\pi^+\pi^-(NR)$	New		< 3.8			< 3.8
313	$f_0(980)\rho^0 \dagger$	< 0.53	< 0.34	< 0.3			< 0.3
314	$f_0(980)f_0(980) \dagger$	< 0.16	< 0.16	< 0.1			< 0.1
315	$a_1^\mp\pi^\pm$	33 ± 5	$33.2 \pm 3.8 \pm 3.0$	$29.8 \pm 3.2 \pm 4.6$			31.7 ± 3.7
316	$b_1^\mp\pi^\pm \dagger$	10.9 ± 1.5	$10.9 \pm 1.2 \pm 0.9$				10.9 ± 1.5
—	$b_1^0\pi^0 \dagger$	New	< 1.9				< 1.9
319	$\rho^+\rho^-$	24.2 ± 3.1	$25.5 \pm 2.1^{+3.6}_{-3.9}$	$22.8 \pm 3.8^{+2.3}_{-2.6}$			$24.2^{+3.1}_{-3.2}$
321	$\omega\pi^0$	< 1.2	< 0.5	< 2.0	< 5.5		< 0.5
323	$a_1^\pm\rho^\mp$	< 61	< 61				< 61
—	$b_1^\pm\rho^\mp \dagger$	New	< 1.7				< 1.7

†Product BF - daughter BF taken to be 100%, ‡Relative BF converted to absolute BF

Heavy Flavor Averaging Group
April 2009

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

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

RPP#	Mode	PDG2008 Avg.	CDF	DØ	New avg.
179	$\mathcal{B}(B^0 \rightarrow K^+K^-)/\mathcal{B}(B^0 \rightarrow K^+\pi^-)$		$0.020 \pm 0.008 \pm 0.006$		0.020 ± 0.010
229	$\mathcal{B}(B^0 \rightarrow \pi^+\pi^-)/\mathcal{B}(B^0 \rightarrow K^+\pi^-)$		$0.259 \pm 0.017 \pm 0.016$		0.259 ± 0.023

Charmless Mesonic Decays:

BABAR References

- [1] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **97**, 171805 (2006).
- [2] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **101**, 201801 (2008).
- [3] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **76**, 031103 (2007).
- [4] *BABAR* Collaboration, B. Aubert *et al.*, Phys. Rev. D **70**, 032006 (2004).
- [5] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **70**, 111102 (2004).
- [6] *BABAR* Collaboration (B. Aubert *et al.*), arXiv:0807.4226 (2008).
- [7] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **91**, 201802 (2003).
- [8] *BABAR* Collaboration, (B. Aubert *et al.*), Phys. Rev. D **78**, 091102 (2008).
- [9] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **93**, 051802 (2004).
- [10] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **76**, 011103 (2007).
- [11] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **75**, 012008 (2007).
- [12] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **78**, 071104 (2008).
- [13] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **76**, 091102 (2007).
- [14] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **93**, 181805 (2004).
- [15] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **99**, 201802 (2007).
- [16] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **99**, 261801 (2007).
- [17] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **97**, 051802 (2006).
- [18] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **69**, 011102 (2004).
- [19] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **78**, 092008 (2008).
- [20] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **76**, 052007 (2007).
- [21] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **74**, 032003 (2006).
- [22] *BABAR* Collaboration, (B. Aubert *et al.*), Phys. Rev. D **78**, 011104 (2008).
- [23] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **98**, 051802 (2007).
- [24] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **73**, 031101 (2006).
- [25] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **95**, 011801 (2005).
- [26]
- [27] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **74**, 031105 (2006).
- [28] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **98**, 051803 (2007).
- [29] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **74**, 051104 (2006).

- [30] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **74**, 051102 (2006).
- [31] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **71**, 111101 (2005).
- [32] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **72**, 072003 (2005).
- [33] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **75**, 091103 (2007).
- [34] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **78**, 011107 (2008).
- [35] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **74**, 032005 (2006).
- [36] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **97**, 201801 (2006).
- [37] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **74**, 031104 (2006).
- [38] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **74**, 011102 (2006).
- [39] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **74**, 072008 (2006).
- [40] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **97**, 261803 (2006).
- [41] *BABAR* Collaboration, W. T. Ford, arXiv:0810.0494 [hep-ex] (2008).
- [42] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **102**, 141802 (2009).
- [43] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **77**, 011101 (2008).
- [44] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **97**, 201802 (2006).
- [45] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **75**, 111102 (2007).
- [46] *BABAR* Collaboration, talk by F. Blanc presented at MoriondQCD (2007).
- [47] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **76**, 051103 (2007).
- [48] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **76**, 071103 (2007).
- [49] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **99**, 241803 (2007).
- [50] *BABAR* Collaboration, (B. Aubert *et al.*), Phys. Rev. Lett. **100**, 051803 (2008).
- [51] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **100**, 081801 (2008).
- [52] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **99**, 221801 (2007).
- [53] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **76**, 071104 (2007).
- [54] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **79**, 051101 (2009).
- [55] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **78**, 052005 (2008).
- [56] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **78**, 012004 (2008).
- [57] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **101**, 091801 (2008).
- [58] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **78**, 051103 (2008).
- [59] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **101**, 161801 (2008).
- [60] *BABAR* Collaboration (B. Aubert *et al.*), arXiv:0808.0579 (2008).

[61] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **79**, 052005 (2009).

[62] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **79**, 051102 (2009).

[63] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **79**, 072006 (2009).

[64]

[65]

[66]

[67]

[68]

[69]

[70]

Belle References

- [71] Belle Collaboration (S.-W. Lin, P. Chang *et al.*), Phys. Rev. Lett. **98**, 181804 (2007).
- [72] Belle Collaboration, (J. Schümann, C.H. Wang *et al.*), Phys. Rev. D **75**, 092002 (2007).
- [73] Belle Collaboration (S.-W. Lin, P. Chang *et al.*), Phys. Rev. Lett. **99**, 121601 (2007).
- [74] Belle Collaboration, (P. Chang *et al.*), Phys. Rev. D **71**, 091106 (2005).
- [75] Belle Collaboration, (P. Goldenzweig *et al.*), Phys. Rev. Lett. **101**, 231801 (2008).
- [76] Belle Collaboration, (C.-M. Jen, P. Chang *et al.*), Phys. Rev. D **74**, 111101 (2006).
- [77] Belle Collaboration, (C.H. Wang *et al.*), Phys. Rev. D **75**, 092005 (2007).
- [78] Belle Collaboration (A. Garmash *et al.*), Phys. Rev. D **69**, 012001 (2004).
- [79] Belle Collaboration, (A. Kusaka, C.H. Wang *et al.*), Phys. Rev. D **77**, 072001 (2008).
- [80] Belle Collaboration, (C.C. Chiang *et al.*), Phys. Rev. D **77**, 111102 (2008).
- [81] Belle Collaboration (J. Zhang, M. Nakao *et al.*), Phys. Rev. Lett. **91**, 221801 (2003).
- [82] Belle Collaboration (A. Gordon *et al.*), Phys. Lett. B **542**, 183 (2002).
- [83] Belle Collaboration (Y.-T. Shen, K.-F. Chen, P. Chang *et al.*), arXiv:0802.1547 (2008).
- [84] Belle Collaboration (K.-F. Chen *et al.*), Phys. Rev. Lett. **91**, 201801 (2003).
- [85] Belle Collaboration (P. Chang *et al.*), Phys. Lett. B **599**, 148 (2004).
- [86] Belle Collaboration (A. Garmash *et al.*), Phys. Rev. D **71**, 092003 (2005).
- [87]
- [88] Belle Collaboration, (J. Zhang *et al.*), Phys. Rev. Lett. **94**, 031801 (2005).
- [89] Belle Collaboration (K. Abe *et al.*), hep-ex/0610065 (2006).
- [90]
- [91]
- [92] Belle Collaboration, (J. Zhang *et al.*), Phys. Rev. Lett. **95**, 141801 (2005).
- [93] Belle Collaboration, (A. Somov *et al.*), Phys. Rev. Lett. **96**, 171801 (2006).
- [94] Belle Collaboration, (J. Schümann *et al.*), Phys. Rev. Lett. **97**, 061802 (2006).
- [95] Belle Collaboration, (P. Chang *et al.*), Phys. Rev. D **75**, 071104 (2007).
- [96] Belle Collaboration, (A. Garmash *et al.*), Phys. Rev. Lett. **96**, 251803 (2006).
- [97] Belle Collaboration, (K. Abe *et al.*), arXiv:0706.3279 (2007).
- [98] Belle Collaboration, (A. Garmash *et al.*), Phys. Rev. D **75**, 012006 (2007).
- [99]
- [100]

CLEO References

- [101] CLEO Collaboration (A. Bornheim *et al.*), Phys. Rev. D **68**, 052002 (2003).
- [102] CLEO Collaboration (S.J. Richichi *et al.*), Phys. Rev. Lett. **85**, 520 (2000).
- [103] CLEO Collaboration (R.A. Briere *et al.*), Phys. Rev. Lett. **86**, 3718 (2001).
- [104] CLEO Collaboration (C.P. Jessop *et al.*), Phys. Rev. Lett. **85**, 2881 (2000).
- [105] CLEO Collaboration (R. Godang *et al.*), Phys. Rev. Lett. **88**, 021802 (2002).
- [106] CLEO Collaboration (T. Bergfeld *et al.*), Phys. Rev. Lett. **81**, 272 (1998).
- [107] CLEO Collaboration (E. Eckhart *et al.*), Phys. Rev. Lett. **89**, 251801 (2002).
- [108] CLEO Collaboration (D.M. Asner *et al.*), Phys. Rev. D **53**, 1039 (1996).
- [109] CLEO Collaboration (T. Bergfeld *et al.*), Phys. Rev. Lett. **77** 4503 (1996).
- [110] CLEO Collaboration (B. Behrens *et al.*), Phys. Rev. Lett. **80** 3710 (1998).

CDF References

- [111] CDF Collaboration (D. Acosta *et al.*), Phys. Rev. Lett. **95** 031801 (2005).
- [112] CDF Collaboration, M. Morello, hep-ex/0612018 (Beauty 2006 contributed paper).
- [113] CDF Collaboration, (A. Aaltonen *et al.*), arXiv:0812.4271 (2008).