December 2011

Heavy Flavor Averaging Group

Compilation of CP Asymmetries for B^+ modes

In PDG2010 | New since PDG2010 (preliminary) | New since PDG2010 (published)

RPP#	Mode	PDG2010 Avg.	BABAR	Belle	CLEO	CDF	New Avg.
220	$K^0\pi^+$	0.009 ± 0.029	$-0.029 \pm 0.039 \pm 0.010$	$-0.014 \pm 0.012 \pm 0.006$	$0.18 \pm 0.24 \pm 0.02$		-0.015 ± 0.012
221	$K^+\pi^0$	0.051 ± 0.025	$0.030 \pm 0.039 \pm 0.010$	$0.043 \pm 0.024 \pm 0.002$	$-0.29 \pm 0.23 \pm 0.02$		0.037 ± 0.021
222	$\eta' K^+$	0.013 ± 0.017	$0.008^{+0.017}_{-0.018} \pm 0.009$	$0.028 \pm 0.028 \pm 0.021$	$0.03 \pm 0.12 \pm 0.02$		$0.013^{+0.016}_{-0.017}$
223	$\eta' K^{*+}$	$-0.30^{+0.33}_{-0.37} \pm 0.02$	$-0.26 \pm 0.27 \pm 0.02$				-0.26 ± 0.27
–	$\eta' K_0^*(1430)^+$	New	$0.06 \pm 0.20 \pm 0.02$				0.06 ± 0.20
–	$\eta' K_2^*(1430)^+$	New	$0.15 \pm 0.13 \pm 0.02$				0.15 ± 0.13
224	ηK^+	-0.37 ± 0.09	$-0.36 \pm 0.11 \pm 0.03$	$-0.38 \pm 0.11 \pm 0.01$			-0.37 ± 0.08
225	ηK^{*+}	0.02 ± 0.06	$0.01 \pm 0.08 \pm 0.02$	$0.03 \pm 0.10 \pm 0.01$			0.02 ± 0.06
226	$\eta K_0^*(1430)^+$	$0.05 \pm 0.13 \pm 0.02$	$0.05 \pm 0.13 \pm 0.02$				0.05 ± 0.13
227	$\eta K_2^*(1430)^+$	$-0.45 \pm 0.30 \pm 0.02$	$-0.45 \pm 0.30 \pm 0.02$				-0.45 ± 0.30
236	ωK^+	0.02 ± 0.05	$-0.01 \pm 0.07 \pm 0.01$	$0.05^{+0.08}_{-0.07} \pm 0.01$			0.02 ± 0.05
237	ωK^{*+}	0.29 ± 0.35	$0.29 \pm 0.35 \pm 0.02$				0.29 ± 0.35
239	$\omega K_0^*(1430)^+$	-0.10 ± 0.09	$-0.10 \pm 0.09 \pm 0.02$				-0.10 ± 0.09
240	$\omega K_2^*(1430)^+$	0.14 ± 0.15	$0.14 \pm 0.15 \pm 0.02$				0.14 ± 0.15
243	$K^{*0}\pi^+$	-0.04 ± 0.09	$0.032 \pm 0.052^{+0.016}_{-0.013}$	$-0.149 \pm 0.064 \pm 0.022$			-0.038 ± 0.042
244	$K^{*+}\pi^0$	$0.04 \pm 0.29 \pm 0.05$	$-0.06 \pm 0.24 \pm 0.04$				-0.06 ± 0.24
245	$K^+\pi^+\pi^-$	0.038 ± 0.022	$0.028 \pm 0.020 \pm 0.023$	$0.049 \pm 0.026 \pm 0.020$			0.038 ± 0.022
–	$K^+\pi^0\pi^0$	New	$-0.006 \pm 0.006 \pm 0.004$				-0.006 ± 0.007
248	$f_0(980)K^+$	$-0.10^{+0.05}_{-0.04}$	$-0.106 \pm 0.050^{+0.036}_{-0.015}$	$-0.077 \pm 0.065^{+0.046}_{-0.026}$			$-0.095^{+0.049}_{-0.042}$
249	$f_2(1270)K^+$	$-0.68^{+0.19}_{-0.017}$	$-0.85 \pm 0.22^{+0.26}_{-0.13}$	$-0.59 \pm 0.22 \pm 0.04$			$-0.68^{+0.20}_{-0.18}$
253	$f_0(1500)K^+$ †	$0.28 \pm 0.26^{+0.15}_{-0.14}$	$0.28 \pm 0.26^{+0.15}_{-0.14}$				$0.28^{+0.30}_{-0.29}$
255	$\rho^0 K^+$	0.37 ± 0.10	$0.44 \pm 0.10^{+0.06}_{-0.14}$	$0.30 \pm 0.11^{+0.11}_{-0.05}$			0.37 ± 0.11
256	$K_0^*(1430)^0\pi^+$	0.55 ± 0.33	$0.032 \pm 0.035^{+0.034}_{-0.028}$	$0.076 \pm 0.038^{+0.028}_{-0.022}$			$0.055^{+0.034}_{-0.032}$
257	$K_2^*(1430)^0\pi^+$	$0.05 \pm 0.23^{+0.18}_{-0.08}$	$0.05 \pm 0.23^{+0.18}_{-0.08}$				$0.05^{+0.29}_{-0.24}$
265	$\rho^+ K^0$	$-0.12 \pm 0.17 \pm 0.02$	$-0.12 \pm 0.17 \pm 0.02$				-0.12 ± 0.17
266	$K^{*+}\pi^+\pi^-$	$0.07 \pm 0.07 \pm 0.04$	$0.07 \pm 0.07 \pm 0.04$				0.07 ± 0.08
267	$K^{*+}\rho^0$	$0.20^{+0.32}_{-0.29} \pm 0.04$	$0.31 \pm 0.13 \pm 0.03$				0.31 ± 0.13
268	$f_0(980)K^{*+}$	$-0.34 \pm 0.21 \pm 0.03$	$-0.15 \pm 0.12 \pm 0.03$				-0.15 ± 0.12
269	$a_1^+ K^0$	$0.12 \pm 0.11 \pm 0.02$	$0.12 \pm 0.11 \pm 0.02$				0.12 ± 0.11
270	$b_1^+ K^0$	-0.03 ± 0.15	$-0.03 \pm 0.15 \pm 0.02$				-0.03 ± 0.15
271	$K^{*0}\rho^+$	$-0.01 \pm 0.16 \pm 0.02$	$-0.01 \pm 0.16 \pm 0.02$				-0.01 ± 0.16
274	$b_1^0 K^+$	$-0.46 \pm 0.20 \pm 0.02$	$-0.46 \pm 0.20 \pm 0.02$				-0.46 ± 0.20
277	$K^+\overline{K}^0$	0.12 ± 0.18	$0.10 \pm 0.26 \pm 0.03$	$0.017 \pm 0.168 \pm 0.002$			0.041 ± 0.141
279	$K^+K_SK_S$	-0.04 ± 0.11	$-0.04 \pm 0.11 \pm 0.02$				-0.04 ± 0.11
281	$K^+K^-\pi^+$	$0.00 \pm 0.10 \pm 0.03$	$0.00 \pm 0.10 \pm 0.03$				0.00 ± 0.10
291	$K^+K^-K^+$	$-0.017 \pm 0.026 \pm 0.015$	$-0.02 \pm 0.03 \pm 0.02$				-0.02 ± 0.04
292	ϕK^+	-0.01 ± 0.06	$0.00 \pm 0.08 \pm 0.02$	$0.01 \pm 0.12 \pm 0.05$		$-0.07 \pm 0.17^{+0.03}_{-0.02}$	-0.01 ± 0.06
300	$K^{*+}K^+K^-$	$0.11 \pm 0.08 \pm 0.03$	$0.11 \pm 0.08 \pm 0.03$				0.11 ± 0.09
301	ϕK^{*+}	-0.01 ± 0.08	$0.00 \pm 0.09 \pm 0.04$	$-0.02 \pm 0.14 \pm 0.03$			-0.01 ± 0.08
303	$\phi K_1(1270)^+$	0.15 ± 0.20	$0.15 \pm 0.19 \pm 0.05$				0.15 ± 0.20
306	$\phi K_0^*(1430)^+$	0.04 ± 0.15	$0.04 \pm 0.15 \pm 0.04$				0.04 ± 0.15
307	$\phi K_2^*(1430)^+$	-0.23 ± 0.20	$-0.23 \pm 0.19 \pm 0.06$				-0.23 ± 0.20
310	$\phi\phi K^+$	New	$-0.10 \pm 0.08 \pm 0.02$	$0.01^{+0.19}_{-0.16} \pm 0.02$			-0.08 ± 0.07
314	$K^{*+}\gamma$	0.18 ± 0.29	$0.18 \pm 0.28 \pm 0.07$				0.18 ± 0.29
316	$K^+\eta\gamma$	-0.12 ± 0.07	$-0.09 \pm 0.10 \pm 0.01$	$-0.16 \pm 0.09 \pm 0.06$			-0.12 ± 0.07
318	$K^+\phi\gamma$	$-0.26 \pm 0.14 \pm 0.05$	$-0.26 \pm 0.14 \pm 0.05$	$-0.03 \pm 0.11 \pm 0.08$			-0.13 ± 0.10
329	$\rho^+\gamma$	-0.11 ± 0.33		$-0.11 \pm 0.32 \pm 0.09$			-0.11 ± 0.33
330	$\pi^+\pi^0$	0.06 ± 0.05	$0.03 \pm 0.08 \pm 0.01$	$0.025 \pm 0.043 \pm 0.007$			0.026 ± 0.039
331	$\pi^+\pi^-\pi^+$	$0.032^{+0.059}_{-0.057}$	$0.032 \pm 0.044^{+0.040}_{-0.037}$				$0.032^{+0.059}_{-0.057}$
332	$\rho^0\pi^+$	$0.18^{+0.09}_{-0.17}$	$0.18 \pm 0.07^{+0.05}_{-0.15}$				$0.18^{+0.09}_{-0.17}$
334	$f_2(1270)\pi^+$	$0.41^{+0.31}_{-0.29}$	$0.41 \pm 0.25^{+0.18}_{-0.15}$				$0.41^{+0.31}_{-0.29}$
335	$\rho(1450)^0\pi^+$	$-0.06^{+0.36}_{-0.42}$	$-0.06 \pm 0.28^{+0.23}_{-0.32}$				$-0.06^{+0.36}_{-0.42}$
338	$\pi^+\pi^-\pi^+(NR)$	$-0.14^{+0.23}_{-0.16}$	$-0.14 \pm 0.14^{+0.18}_{-0.08}$				$-0.14^{+0.23}_{-0.16}$
340	$\rho^+\pi^0$	0.02 ± 0.11	$-0.01 \pm 0.13 \pm 0.02$	$0.06 \pm 0.17^{+0.04}_{-0.05}$			0.02 ± 0.11
342	$\rho^+\rho^0$	-0.05 ± 0.05	$-0.054 \pm 0.055 \pm 0.010$	$0.00 \pm 0.22 \pm 0.03$			-0.051 ± 0.054
346	$\omega\pi^+$	-0.04 ± 0.06	$-0.02 \pm 0.08 \pm 0.01$	$-0.02 \pm 0.09 \pm 0.01$	$-0.34 \pm 0.25 \pm 0.02$		-0.04 ± 0.06
347	$\omega\rho^+$	-0.20 ± 0.09	$-0.20 \pm 0.09 \pm 0.02$				-0.20 ± 0.09
348	$\eta\pi^+$	-0.13 ± 0.10	$-0.03 \pm 0.09 \pm 0.03$	$-0.19 \pm 0.06 \pm 0.01$			-0.14 ± 0.05
349	$\eta\rho^+$	0.11 ± 0.11	$0.13 \pm 0.11 \pm 0.02$	$-0.04^{+0.34}_{-0.32} \pm 0.01$			0.11 ± 0.11
350	$\eta'\pi^+$	0.06 ± 0.16	$0.03 \pm 0.17 \pm 0.02$	$0.20^{+0.37}_{-0.36} \pm 0.04$			0.06 ± 0.15
351	$\eta'\rho^+$	$0.04 \pm 0.28 \pm 0.02$	$0.26 \pm 0.17 \pm 0.02$				0.26 ± 0.17
359	$b_1^0\pi^+$	$0.05 \pm 0.16 \pm 0.02$	$0.05 \pm 0.16 \pm 0.02$				0.05 ± 0.16
368	$p\overline{p}\pi^+$	0.00 ± 0.04	$0.04 \pm 0.07 \pm 0.04$	$-0.17 \pm 0.10 \pm 0.02$			-0.04 ± 0.06
371	$p\overline{p}K^+$	-0.16 ± 0.07	$-0.16 \pm 0.08 \pm 0.04$	$-0.02 \pm 0.05 \pm 0.02$			-0.06 ± 0.05
376	$p\overline{p}K^{*+}$	0.21 ± 0.16	$0.32 \pm 0.13 \pm 0.05$	$-0.01 \pm 0.19 \pm 0.02$			0.21 ± 0.11
379	$p\overline{\Lambda}\gamma$	$0.17 \pm 0.16 \pm 0.05$		$0.17 \pm 0.16 \pm 0.05$			0.17 ± 0.17
380	$p\overline{\Lambda}\pi^0$	$0.01 \pm 0.17 \pm 0.04$		$0.01 \pm 0.17 \pm 0.04$			0.01 ± 0.17
416	$K^+\ell\ell$	-0.01 ± 0.09	$-0.18 \pm 0.19 \pm 0.01$	$0.04 \pm 0.10 \pm 0.02$			-0.01 ± 0.09
417	$K^+e^+e^-$	0.14 ± 0.14		$0.14 \pm 0.14 \pm 0.03$			0.14 ± 0.14
418	$K^+\mu^+\mu^-$	-0.05 ± 0.13		$-0.05 \pm 0.13 \pm 0.03$			-0.05 ± 0.13
421	$K^{*+}\ell\ell$	-0.09 ± 0.14	$0.01^{+0.26}_{-0.24} \pm 0.02$	$-0.13^{+0.17}_{-0.16} \pm 0.01$			$-0.09^{+0.14}_{-0.13}$
422	$K^{*+}e^+e^-$	$-0.14^{+0.23}_{-0.22}$		$-0.14^{+0.23}_{-0.22} \pm 0.02$			$-0.14^{+0.23}_{-0.22}$
423	$K^{*+}\mu^+\mu^-$	-0.12 ± 0.24		$-0.12 \pm 0.24 \pm 0.02$			-0.12 ± 0.24

December 2011

Heavy Flavor Averaging Group

Compilation of CP Asymmetries for B^0 modes

In PDG2010 New since PDG2010 (preliminary) New since PDG2010 (published)

RPP#	Mode	PDG2010 Avg.	BABAR	Belle	CDF	LHCb	New Avg.
210	$K^+\pi^-$	-0.098 ± 0.013	$-0.107 \pm 0.016^{+0.006}_{-0.004}$	$-0.069 \pm 0.014 \pm 0.007$	$-0.086 \pm 0.023 \pm 0.009$	$-0.088 \pm 0.011 \pm 0.008$	-0.087 ± 0.008
213	$\eta' K^{*0}$	$0.08 \pm 0.25 \pm 0.02$	$0.02 \pm 0.23 \pm 0.02$				0.02 ± 0.23
–	$\eta' K_0^*(1430)^0$	New	$-0.19 \pm 0.17 \pm 0.02$				-0.19 ± 0.17
–	$\eta' K_2^*(1430)^0$	New	$0.14 \pm 0.18 \pm 0.02$				0.14 ± 0.18
215	ηK^{*0}	0.19 ± 0.05	$0.21 \pm 0.06 \pm 0.02$	$0.17 \pm 0.08 \pm 0.01$			0.19 ± 0.05
216	$\eta K_0^*(1430)^0$	$0.06 \pm 0.13 \pm 0.02$	$0.06 \pm 0.13 \pm 0.02$				0.06 ± 0.13
217	$\eta K_2^*(1430)^0$	$-0.07 \pm 0.19 \pm 0.02$	$-0.07 \pm 0.19 \pm 0.02$				-0.07 ± 0.19
222	$b_1^- K^+$	$0.07 \pm 0.12 \pm 0.02$	$0.07 \pm 0.12 \pm 0.02$				0.07 ± 0.12
227	ωK^{*0}	0.45 ± 0.25	$0.45 \pm 0.25 \pm 0.02$				0.45 ± 0.25
229	$\omega K_0^*(1430)^0$	-0.07 ± 0.09	$-0.07 \pm 0.09 \pm 0.02$				-0.07 ± 0.09
230	$\omega K_2^*(1430)^0$	0.37 ± 0.17	$0.37 \pm 0.17 \pm 0.02$				0.37 ± 0.17
232	$K^+\pi^-\pi^0$	0.00 ± 0.06	$-0.030^{+0.045}_{-0.051} \pm 0.055$	$0.07 \pm 0.11 \pm 0.01$			$0.000^{+0.059}_{-0.061}$
233	$\rho^- K^+$	0.15 ± 0.13	$0.20 \pm 0.09 \pm 0.08$	$0.22^{+0.22+0.06}_{-0.23-0.02}$			0.20 ± 0.11
236	$K^+\pi^-\pi^0(NR)$	$0.23^{+0.22}_{-0.28}$	$0.10 \pm 0.16 \pm 0.08$				0.10 ± 0.18
238	$K_0^*(1430)^0\pi^0$	-0.22 ± 0.32	$-0.15 \pm 0.10 \pm 0.04$				-0.15 ± 0.11
242	$K^0\pi^+\pi^-$	-0.01 ± 0.05	$-0.01 \pm 0.05 \pm 0.01$				-0.01 ± 0.05
245	$K^{*+}\pi^-$	-0.19 ± 0.07	$-0.24 \pm 0.07 \pm 0.02$	$-0.21 \pm 0.11 \pm 0.07$			-0.23 ± 0.06
246	$K_0^*(1430)^+\pi^-$	0.10 ± 0.07	$0.07 \pm 0.14 \pm 0.01$				0.07 ± 0.14
252	$K^{*0}\pi^0$	$-0.09^{+0.23}_{-0.26}$	$-0.15 \pm 0.12 \pm 0.04$				-0.15 ± 0.13
259	$K^{*0}\pi^+\pi^-$	$0.07 \pm 0.04 \pm 0.03$	$0.07 \pm 0.04 \pm 0.03$				0.07 ± 0.05
260	$K^{*0}\rho^0$	$0.09 \pm 0.19 \pm 0.02$	$-0.06 \pm 0.09 \pm 0.02$				-0.06 ± 0.09
265	$K^{*+}\rho^-$	New	$0.21 \pm 0.15 \pm 0.02$				0.21 ± 0.15
261	$f_0(980)K^{*0}$	-0.17 ± 0.28	$0.07 \pm 0.10 \pm 0.02$				0.07 ± 0.10
264	$a_1^- K^+$	$-0.16 \pm 0.12 \pm 0.01$	$-0.16 \pm 0.12 \pm 0.01$				-0.16 ± 0.12
279	$K^{*0}K^+K^-$	$0.01 \pm 0.05 \pm 0.02$	$0.01 \pm 0.05 \pm 0.02$				0.01 ± 0.05
280	ϕK^{*0}	0.01 ± 0.05	$0.01 \pm 0.06 \pm 0.03$	$0.02 \pm 0.09 \pm 0.02$			0.01 ± 0.05
281	$K^{*0}\pi^+K^-$	$0.22 \pm 0.33 \pm 0.20$	$0.22 \pm 0.33 \pm 0.20$				0.22 ± 0.39
289	$\phi K_0^*(1430)^0$	0.20 ± 0.15	$0.20 \pm 0.14 \pm 0.06$				0.20 ± 0.15
294	$\phi K_2^*(1430)^0$	-0.08 ± 0.13	$-0.08 \pm 0.12 \pm 0.05$				-0.08 ± 0.13
301	$K^{*0}\gamma$	-0.16 ± 0.23	$-0.16 \pm 0.22 \pm 0.07$				-0.16 ± 0.23
316	$\pi^0\pi^0$		$0.43 \pm 0.26 \pm 0.05$	$0.44^{+0.53}_{-0.52} \pm 0.17$			0.43 ± 0.24
359	$b_1^\mp \pi^\pm$	$-0.05 \pm 0.10 \pm 0.02$	$-0.05 \pm 0.10 \pm 0.02$				-0.05 ± 0.10
371	$p\overline{p}K^{*0}$	0.05 ± 0.12	$0.11 \pm 0.13 \pm 0.06$	$-0.08 \pm 0.20 \pm 0.02$			0.05 ± 0.12
373	$p\overline{\Lambda}\pi^-$	0.04 ± 0.07	$-0.10 \pm 0.10 \pm 0.02$	$-0.02 \pm 0.10 \pm 0.03$			-0.06 ± 0.07
427	$K^{*0}\ell\ell$	-0.05 ± 0.10	$0.02 \pm 0.20 \pm 0.02$	$-0.08 \pm 0.12 \pm 0.02$			-0.05 ± 0.10
428	$K^{*0}e^+e^-$	-0.21 ± 0.19		$-0.21 \pm 0.19 \pm 0.02$			-0.21 ± 0.19
429	$K^{*0}\mu^+\mu^-$	0.00 ± 0.15		$0.00 \pm 0.15 \pm 0.03$			0.00 ± 0.15

† Measurements of time-dependent CP asymmetries are listed on the Unitarity Triangle home page. (http://www.slac.stanford.edu/xorg/hfag/triangle/index.html)

Compilation of CP Asymmetries for $B^{\pm}/B^0$ Admixture

RPP#	Mode	PDG2010 Avg.	BABAR	Belle	CLEO	New Avg.
65	$K^*\gamma$	-0.003 ± 0.017	$-0.003 \pm 0.017 \pm 0.007$	$-0.015 \pm 0.044 \pm 0.012$	$0.08 \pm 0.13 \pm 0.03$	-0.003 ± 0.017
7	$s\gamma$	0.014 ± 0.028	$-0.011 \pm 0.030 \pm 0.014$	$0.002 \pm 0.050 \pm 0.030$	$-0.079 \pm 0.108 \pm 0.022$	-0.012 ± 0.028
–	$(s+d)\gamma$	$-0.110 \pm 0.115 \pm 0.017$	$-0.11 \pm 0.12 \pm 0.02$			-0.11 ± 0.12
–	K^+X	New	$0.17 \pm 0.24 \pm 0.05$†			0.17 ± 0.24
–	π^+X	New	$0.10 \pm 0.16 \pm 0.05$†			0.10 ± 0.17
80	$s\eta$	New		$0.13 \pm 0.04^{+0.02}_{-0.03}$§		$0.13^{+0.04}_{-0.05}$
115	$s\ell\ell$	-0.22 ± 0.26	$-0.22 \pm 0.26 \pm 0.02$			-0.22 ± 0.26
118	$K^*e^+e^-$	-0.18 ± 0.15		$-0.18 \pm 0.15 \pm 0.01$		-0.18 ± 0.15
120	$K^*\mu^+\mu^-$	-0.03 ± 0.13		$-0.03 \pm 0.13 \pm 0.02$		-0.03 ± 0.13
122	$K^*\ell\ell$	-0.07 ± 0.08	$0.01^{+0.16}_{-0.15} \pm 0.01$	$-0.10 \pm 0.10 \pm 0.01$		-0.07 ± 0.08

† $p^* > 2.34$ GeV; § $0.4 < M_{X_s} < 2.6$ GeV;

Compilation of CP Asymmetries for B_s modes

RPP#	Mode	PDG2010 Avg.	Belle	CDF	LHCb	New Avg.
22	$K^+\pi^-$	New		$0.39 \pm 0.15 \pm 0.08$	$0.27 \pm 0.08 \pm 0.02$	0.29 ± 0.07

Charmless Hadronic CP Asymmetry References: *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**, 171804 (2008).

[3] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **80**, 112001 (2009).

[4] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **74**, 032003 (2006).

[5] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **76** 092004 (2007).

[6] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **76**, 091102 (2007).

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

[8] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **76**, 031103 (2007).

[9] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **91**, 171802 (2003).

[10] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **97**, 201802 (2006).

[11] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **78**, 011107 (2008).

[12] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **102**, 091803 (2009).

[13] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **75**, 091103 (2007).

[14] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **93**, 081802 (2004).

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

[16] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **80**, 112002 (2009).

[17] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **76**, 011103 (2007).

[18] *BABAR* Collaboration (J. P. Lees *et al.*), Phys. Rev. D **84**, 092007 (2011).

[19] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **93**, 181805 (2004).

[20] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **75**, 051102 (2007).

[21] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **78**, 092008 (2008).

[22] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **78**, 012004 (2008).

[23] *BABAR* Collaboration, (B. Aubert *et al.*), Phys. Rev. D **79**, 112009 (2009).

[24] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **97**, 201801 (2006).

[25] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **79**, 011102 (2009).

[26] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **97**, 171803 (2006).

[27] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **74**, 051104 (2006).

[28] *BABAR* Collaboration (P. del Amo Sanchez *et al.*), Phys. Rev. D **82**, 011502 (2010).

[29] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **102**, 141802 (2009).

[30] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **72** 051101 (2005).

[31] *BABAR* Collaboration (B. Aubert *et al.*), arXiv:0807.4226 (2008).

[32] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **99**, 201802 (2007).

[33] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **99**, 241803 (2007).

[34] *BABAR* Collaboration, (B. Aubert *et al.*), Phys. Rev. Lett. **100**, 051803 (2008).

[35] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **99**, 221801 (2007).

[36] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **76**, 071104 (2007).

[37] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. D **78**, 052005 (2008).

[38] *BABAR* Collaboration, (B. Aubert *et al.*), Phys. Rev. D **78**, 011104 (2008).

[39] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **101**, 161801 (2008).

[40] *BABAR* Collaboration (J. P. Lees *et al.*), Phys. Rev. D **83**, 112010 (2011).

[41] *BABAR* Collaboration (B. Aubert *et al.*), Phys. Rev. Lett. **103**, 211802 (2009).

[42] *BABAR* Collaboration (P. del Amo Sanchez *et al.*), Phys. Rev. D **83**, 031103 (2011).

[43] *BABAR* Collaboration (P. del Amo Sanchez *et al.*), Phys. Rev. D **83**, 051101 (2010).

[44] *BABAR* Collaboration (J. P. Lees *et al.*), Phys. Rev. D **84**, 012001 (2011).

[45] *BABAR* Collaboration, talk by B. Lindquist at DPF 2011 (2011).

[46]

[47]

[48]

[49]

[50]

Belle References

[51] Belle Collaboration, (C.-M. Jen, P. Chang *et al.*), Phys. Rev. D **74**, 111101 (2006).

[52] Belle Collaboration, (J. Schümann *et al.*), Phys. Rev. Lett. **97**, 061802 (2006).

[53] Belle Collaboration, (K.-F. Chen *et al.*), Phys. Rev. Lett. **94**, 221804 (2005).

[54] Belle Collaboration (P. Chang *et al.*), Phys. Lett. B **599**, 148 (2004).

[55] Belle Collaboration, (C.T. Hoi, P. Chang *et al.*), Phys. Rev. Lett. **108**, 031801 (2012).

[56] Belle Collaboration, (M. Nakao *et al.*), Phys. Rev. D **69**, 112001 (2004).

[57]

[58] Belle Collaboration, (C.H. Wang *et al.*), Phys. Rev. D **75**, 092005 (2007).

[59] Belle Collaboration (K.-F. Chen *et al.*), Phys. Rev. Lett. **91**, 201801 (2003).

[60] Belle Collaboration (J. Zhang, M. Nakao *et al.*), Phys. Rev. Lett. **91**, 221801 (2003).

[61] Belle Collaboration (S. Nishida *et al.*), Phys. Rev. Lett. **93**, 031803 (2004).

[62] Belle Collaboration, (A. Garmash *et al.*), Phys. Rev. Lett. **96**, 251803 (2006).

[63]

[64] Belle Collaboration, (J. Zhang *et al.*), Phys. Rev. Lett. **94**, 031801 (2005).

[65] Belle Collaboration (Y.-T. Shen, K.-F. Chen, P. Chang *et al.*), arXiv:0802.1547 (2008).

[66] Belle Collaboration, (Y. Chao *et al.*), Phys. Rev. Lett. **94**, 181803 (2005).

[67] Belle Collaboration (M.-Z. Wang, Y.-J. Lee *et al.*), Phys. Rev. D **76**, 052004 (2007).

[68] Belle Collaboration (S. Nishida *et al.*), Phys. Lett. B **610**, 23 (2005).

[69] Belle Collaboration (J.-T. Wei, M.-Z. Wang *et al.*), Phys. Lett. B **659**, 80 (2008).

[70] Belle Collaboration, (J.-H. Chen, M.-Z. Wang *et al.*), Phys. Rev. Lett. **100**, 251801 (2008).

[71] Belle Collaboration (J.-T. Wei, P. Chang *et al.*), Phys. Rev. Lett. **103**, 171801 (2009).

[72] Belle Collaboration (K. Nishimura, T.E. Browder *et al.*), Phys. Rev. Lett. **105**, 191803 (2010).

[73] Belle Collaboration (N. Taniguchi, M. Nakao, S. Nishida *et al.*), Phys. Rev. Lett. **101**, 111801 (2008).

[74] Belle Collaboration, (J. Dalseno *et al.*), Phys. Rev. D **79**, 072004 (2009).

[75] Belle Collaboration (H. Sahoo, T.E. Browder *et al.*), Phys. Rev. D **84**, 071101 (2011).

[76] Belle Collaboration talk by P. Chang presented at EPS-HEP (2011).

[77]

[78]

[79]

[80]

CLEO References

[81] CLEO Collaboration (S. Chen *et al.*), Phys. Rev. Lett. **85**, 525 (2000).

[82] CLEO Collaboration (T.E. Coan *et al.*), Phys. Rev. Lett. **84**, 5283 (2000).

[83] CLEO Collaboration (B. I. Eisenstein *et al.*), Phys. Rev. D **68**, 017101 (2003).

[84] CLEO Collaboration, (T. E. Coan *et al.*), Phys. Rev. Lett. **86**, 5661 (2001).

CDF References

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

[86] CDF Collaboration, (T. Aaltonen *et al.*), Phys. Rev. Lett. **106**, 181802 (2011).

[87]

[88]

[89]

[90]

LHCb References

[91] LHCb Collaboration, Talk by A. Carbone at EPS2011.