

Heavy Flavor Averaging Group  
May 2004

Compilation of  $B^+$  Semi-leptonic and Radiative Branching Fractions  
All branching fractions are in units of  $10^{-6}$

In PDG2002    New since PDG2002 (preliminary)    New since PDG2002 (published)

RPP#	Mode	PDG2002 Avg.	BaBar	Belle	CLEO	New Avg.
123	$K^*(892)^+\gamma$	$38 \pm 5$	$38.3 \pm 6.2 \pm 2.2$	$42.5 \pm 3.1 \pm 2.4$	$37.6^{+8.9}_{-8.3} \pm 2.8$	$40.9^{+3.2}_{-3.1}$
124	$K_1(1270)^+\gamma$	$< 7300$		$< 99$		$< 99$
125	$K_1(1400)^+\gamma$	$< 2200$		$< 50$		$< 50$
126	$K_2^*(1430)^+\gamma$	$< 1400$	$14.4 \pm 4.0 \pm 1.3$			$14.4 \pm 4.2$
130	$\rho^+\gamma$	$< 13$	$< 2.1$	$< 2.5$	$< 13$	$< 2.1$
—	$K^+\pi^-\pi^+\gamma$ §	New		$24 \pm 5^{+4}_{-2}$		$24^{+6}_{-5}$
—	$K^{*0}\pi^+\gamma$ §	New		$20^{+7}_{-6} \pm 2$		$20^{+7}_{-6}$
—	$K^+\rho^0\gamma$ §	New		$< 20$		$< 20$
—	$K^+\pi^-\pi^+\gamma$ (N.R.) §	New		$< 9.2$		$< 9.2$
—	$K^+\phi\gamma$	New		$3.4 \pm 0.9 \pm 0.4$		$3.4 \pm 1.0$
173	$K^+e^+e^-$	$< 1.4$	$1.05^{+0.25}_{-0.22} \pm 0.08$	$0.63^{+0.19}_{-0.17} \pm 0.03$	$< 2.4$	$0.80 \pm 0.15$
174	$K^+\mu^+\mu^-$	$1.0^{+0.5}_{-0.4}$	$0.07^{+0.19}_{-0.11} \pm 0.02$	$0.45^{+0.14}_{-0.12} \pm 0.03$	$< 3.68$	$0.34 \pm 0.10$
175	$K^+\nu\bar{\nu}$	$< 240$	$< 70$		$< 240$	$< 70$
176	$K^*(892)^+e^+e^-$	$< 8.9$	$0.20^{+1.34}_{-0.87} \pm 0.27$ ‡	$2.02^{+1.27+0.23}_{-1.01-0.24}$ ‡		$1.29^{+0.89}_{-0.77}$
177	$K^*(892)^+\mu^+\mu^-$	$< 3.9$	$3.07^{+2.58}_{-1.78} \pm 0.44$ ‡	$0.65^{+0.69+0.14}_{-0.53-0.15}$ ‡		$0.92^{+0.70}_{-0.58}$
182	$\pi^-e^+e^+$	$< 3900$			$< 1.6$	$< 1.6$
—	$\rho^-e^+e^+$	New			$< 2.6$	$< 2.6$
183	$\pi^-\mu^+\mu^+$	$< 9100$			$< 1.4$	$< 1.4$
—	$\rho^-\mu^+\mu^+$	New			$< 5.0$	$< 5.0$
184	$\pi^-e^+\mu^+$	$< 6400$			$< 1.3$	$< 1.3$
—	$\rho^-e^+\mu^+$	New			$< 3.3$	$< 3.3$
185	$K^-e^+e^+$	$< 3900$			$< 1.0$	$< 1.00$
186	$K^-\mu^+\mu^+$	$< 9100$			$< 1.8$	$< 1.8$
187	$K^-e^+\mu^+$	$< 6400$			$< 2.0$	$< 2.0$
—	$K^{*-}e^+\mu^+$	New			$< 4.4$	$< 4.4$
—	$K^{*-}e^+e^+$	New			$< 2.8$	$< 2.8$
—	$K^{*-}\mu^+\mu^+$	New			$< 8.3$	$< 8.3$

§  $M_{K\pi\pi} < 2.4 \text{ GeV}/c^2$  ‡ Central values are not significant.