Λ_c^+

$I(J^P) = 0(\frac{1}{2}^+)$ Status: ∗∗∗∗

The parity of the Λ_c^+ is defined to be positive (as are the parities of the proton, neutron, and Λ). The quark content is $u\,d\,c$. Results of an analysis of $p K^- \pi^+$ decays (JEZABEK 92) are consistent with $J = 1/2$. ABLIKIM 21N determines the Λ_c^+ spin to be $J = 1/2$, from an angular analysis of various 2-body Λ_c^+ decays in $e^+ e^- \to \Lambda_c^+ \overline{\Lambda}_c^-$.

We have omitted some results that have been superseded by later experiments. The omitted results may be found in earlier editions.

Λ_c^+ MASS

Our value in 2004, 2284.9$\pm$0.6 MeV, was the average of the measurements now filed below as "not used." The BABAR measurement is so much better that we use it alone. Note that it is about 2.6 (old) standard deviations above the 2004 value.

The fit also includes Σ_c–Λ_c^+ and Λ_c^{*+}–Λ_c^+ mass-difference measurements, but this doesn't affect the Λ_c^+ mass. The new (in 2006) Λ_c^+ mass simply pushes all those other masses higher.

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2286.46$\pm$0.14 OUR FIT					
2286.46$\pm$0.14	4891	[1] AUBERT,B	05S	BABR	$\Lambda K_S^0 K^+$ and $\Sigma^0 K_S^0 K^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2284.7 $\pm$0.6 $\pm$0.7	1134	AVERY	91	CLEO	Six modes
2281.7 $\pm$2.7 $\pm$2.6	29	ALVAREZ	90B	NA14	$p K^- \pi^+$
2285.8 $\pm$0.6 $\pm$1.2	101	BARLAG	89	NA32	$p K^- \pi^+$
2284.7 $\pm$2.3 $\pm$0.5	5	AGUILAR-...	88B	LEBC	$p K^- \pi^+$
2283.1 $\pm$1.7 $\pm$2.0	628	ALBRECHT	88C	ARG	$p K^- \pi^+$, $p \overline{K}^0$, $\Lambda 3\pi$
2286.2 $\pm$1.7 $\pm$0.7	97	ANJOS	88B	E691	$p K^- \pi^+$
2281 $\pm$3	2	JONES	87	HBC	$p K^- \pi^+$
2283 $\pm$3	3	BOSETTI	82	HBC	$p K^- \pi^+$
2290 $\pm$3	1	CALICCHIO	80	HYBR	$p K^- \pi^+$

[1] AUBERT,B 05S uses low-Q $\Lambda K_S^0 K^+$ and $\Sigma^0 K_S^0 K^+$ decays to minimize systematic errors. The error above includes systematic as well as statistical errors. Many cross checks and adjustments to properties of the BABAR detector, as well as the large number of clean events, make this by far the best measurement of the Λ_c^+ mass.

Λ_c^+ MEAN LIFE

Measurements with an error $\geq$ 100 $\times 10^{-15}$ s or with fewer than 20 events have been omitted from the Listings.

VALUE (10^{-15} s)	EVTS	DOCUMENT ID		TECN	COMMENT
202.6 ± 1.0 OUR AVERAGE					
203.20± 0.89± 0.77	107k	ABUDINEN	23A	BEL2	$\Lambda_c^+ \to pK^-\pi^+$, e^+e^- near $\Upsilon(4S)$
202.1 ± 1.7 ± 0.9	304k	[1] AAIJ	19AG	LHCB	$\Lambda_c^+ \to pK^-\pi^+$
204.6 ± 3.4 ± 2.5	8034	LINK	02C	FOCS	$\Lambda_c^+ \to pK^-\pi^+$
198.1 ± 7.0 ± 5.6	1630	KUSHNIR...	01	SELX	$\Lambda_c^+ \to pK^-\pi^+$
179.6 ± 6.9 ± 4.4	4749	MAHMOOD	01	CLE2	$e^+e^- \approx \Upsilon(4S)$
215 ±16 ± 8	1340	FRABETTI	93D	E687	γBe, $\Lambda_c^+ \to pK^-\pi^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
180 ±30 ±30	29	ALVAREZ	90	NA14	γ, $\Lambda_c^+ \to pK^-\pi^+$
200 ±30 ±30	90	FRABETTI	90	E687	γBe, $\Lambda_c^+ \to pK^-\pi^+$
196 $^{+23}_{-20}$	101	BARLAG	89	NA32	$pK^-\pi^+$ + c.c.
220 ±30 ±20	97	ANJOS	88B	E691	$pK^-\pi^+$ + c.c.

[1] AAIJ 19AG reports [Λ_c^+ MEAN LIFE] / [$D^\pm$ MEAN LIFE] = 0.1956 ± 0.0010 ± 0.0013 which we multiply by our best (shown rounded) value $D^\pm$ MEAN LIFE = (1.033 ± 0.005) $\times 10^{-12}$ s. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

Λ_c^+ DECAY MODES

Branching fractions marked with a footnote, e.g. [a], have been corrected for decay modes not observed in the experiments. For example, the submode fraction $\Lambda_c^+ \to p\overline{K}^*(892)^0$ seen in $\Lambda_c^+ \to pK^-\pi^+$ has been multiplied up to include $\overline{K}^*(892)^0 \to \overline{K}^0\pi^0$ decays.

	Mode		Fraction (Γ_i/Γ)	Scale factor/ Confidence level
	Hadronic modes with a p or n: $S=-1$ final states			
Γ_1	pK_S^0		(1.63± 0.07) %	S=1.1
Γ_2	pK_L^0		(1.67± 0.07) %	
Γ_3	$pK^-\pi^+$		(6.37± 0.21) %	S=1.2
Γ_4	$p\overline{K}_0^*(700)^0$		(1.9 ± 0.6) $\times 10^{-3}$	
Γ_5	$p\overline{K}^*(892)^0$	[a]	(1.42± 0.06) %	
Γ_6	$p\overline{K}_0^*(1430)$		(9.4 ± 1.8) $\times 10^{-3}$	
Γ_7	$\Delta(1232)^{++}K^-$		(1.80± 0.08) %	
Γ_8	$\Delta(1600)^{++}K^-$		(2.9 ± 1.0) $\times 10^{-3}$	
Γ_9	$\Delta(1700)^{++}K^-$		(2.5 ± 0.6) $\times 10^{-3}$	
Γ_{10}	$\Lambda(1405)^0\pi^+$		(4.9 ± 1.9) $\times 10^{-3}$	

Γ_{11}	$\Lambda(1520)\pi^+$	[a]	$(1.19\pm 0.16)\times 10^{-3}$	
Γ_{12}	$\Lambda(1600)\pi^+$		$(3.3\pm 1.2)\times 10^{-3}$	
Γ_{13}	$\Lambda(1670)\pi^+$		$(7.5\pm 2.1)\times 10^{-4}$	
Γ_{14}	$\Lambda(1690)\pi^+$		$(7.6\pm 2.3)\times 10^{-4}$	
Γ_{15}	$\Lambda(2000)\pi^+$		$(6.1\pm 0.7)\times 10^{-3}$	
Γ_{16}	$pK^-\pi^+$ nonresonant		(3.5 ± 0.4) %	
Γ_{17}	$pK^0_S\pi^0$		(2.12 ± 0.09) %	S=1.3
Γ_{18}	$pK^0_L\pi^0$		(2.02 ± 0.14) %	
Γ_{19}	$nK^0_S\pi^+$		(1.86 ± 0.09) %	
Γ_{20}	$nK^0_S K^+$		$(3.9\ {}^{+1.7}_{-1.4})\times 10^{-4}$	
Γ_{21}	$nK^0_S\pi^+\pi^0$		$(8.5\pm 1.3)\times 10^{-3}$	
Γ_{22}	$nK^-\pi^+\pi^+$		(1.90 ± 0.12) %	
Γ_{23}	$p\overline{K}^0\eta$		$(9.0\pm 0.6)\times 10^{-3}$	S=1.1
Γ_{24}	$pK^0_S\pi^+\pi^-$		(1.63 ± 0.10) %	S=1.1
Γ_{25}	$pK^0_L\pi^+\pi^-$		(1.69 ± 0.11) %	
Γ_{26}	$pK^-\pi^+\pi^0$		(4.54 ± 0.27) %	S=1.6
Γ_{27}	$pK^*(892)^-\pi^+$	[a]	(1.4 ± 0.5) %	
Γ_{28}	$p(K^-\pi^+)_{\text{nonresonant}}\pi^0$		(4.7 ± 0.8) %	
Γ_{29}	$\Delta(1232)\overline{K}^*(892)$		seen	
Γ_{30}	$pK^-2\pi^+\pi^-$		$(1.4\pm 1.0)\times 10^{-3}$	
Γ_{31}	$pK^-\pi^+2\pi^0$		(1.0 ± 0.5) %	

Hadronic modes with a *p* or *n*: $S=0$ final states

Γ_{32}	$p\pi^0$		$(1.8\pm 0.4)\times 10^{-4}$	
Γ_{33}	$n\pi^+$		$(6.6\pm 1.3)\times 10^{-4}$	
Γ_{34}	$p\eta$		$(1.49\pm 0.08)\times 10^{-3}$	
Γ_{35}	$p\eta'$		$(4.9\pm 0.9)\times 10^{-4}$	
Γ_{36}	$p\omega(782)^0$		$(9.0\pm 1.0)\times 10^{-4}$	S=1.2
Γ_{37}	$p\pi^+\pi^-$		$(4.69\pm 0.22)\times 10^{-3}$	
Γ_{38}	$pf_0(980)$	[a]	$(3.5\pm 2.3)\times 10^{-3}$	
Γ_{39}	$p\rho(770)^0$		$(1.5\pm 0.4)\times 10^{-3}$	
Γ_{40}	$n\pi^+\pi^0$		$(6.4\pm 0.9)\times 10^{-3}$	
Γ_{41}	$nK^+\pi^0$		$<7.1\times 10^{-4}$	CL=90%
Γ_{42}	$n\pi^+\pi^-\pi^+$		$(4.5\pm 0.8)\times 10^{-3}$	
Γ_{43}	$p2\pi^+2\pi^-$		$(2.3\pm 1.5)\times 10^{-3}$	
Γ_{44}	pK^+K^-		$(1.08\pm 0.04)\times 10^{-3}$	
Γ_{45}	$p\phi$	[a]	$(1.06\pm 0.13)\times 10^{-3}$	S=1.1
Γ_{46}	pK^+K^- non-ϕ		$(5.4\pm 1.2)\times 10^{-4}$	
Γ_{47}	$pK^0_S K^0_S$		$(2.41\pm 0.18)\times 10^{-4}$	
Γ_{48}	$p\phi\pi^0$		$(10\pm 4)\times 10^{-5}$	
Γ_{49}	$pK^+K^-\pi^0$ nonresonant		$<6.3\times 10^{-5}$	CL=90%

Hadronic modes with a hyperon: $S=-1$ final states

Γ_{50}	$\Lambda\pi^+$		(1.32 ± 0.05) %	S=1.1

Γ_{51}	$\Lambda(1670)\pi^+$, $\Lambda(1670) \to \eta\Lambda$		$(3.5 \pm 0.5) \times 10^{-3}$	
Γ_{52}	$\Lambda\pi^+\pi^0$		(7.16 ± 0.33) %	
Γ_{53}	$\Lambda\rho^+$		(4.1 ± 0.5) %	
Γ_{54}	$\Sigma(1385)^+\pi^0$, $\Sigma^+ \to \Lambda\pi^+$		$(5.1 \pm 0.7) \times 10^{-3}$	
Γ_{55}	$\Sigma(1385)^0\pi^+$, $\Sigma^0 \to \Lambda\pi^0$		$(5.7 \pm 0.8) \times 10^{-3}$	
Γ_{56}	$\Lambda\pi^-2\pi^+$		(3.69 ± 0.26) %	S=1.5
Γ_{57}	$\Sigma(1385)^+\pi^+\pi^-$, $\Sigma^{*+} \to \Lambda\pi^+$		(1.0 ± 0.5) %	
Γ_{58}	$\Sigma(1385)^-2\pi^+$, $\Sigma^{*-} \to \Lambda\pi^-$		$(7.8 \pm 1.4) \times 10^{-3}$	
Γ_{59}	$\Lambda\pi^+\rho^0$		(1.5 ± 0.6) %	
Γ_{60}	$\Sigma(1385)^+\rho^0$, $\Sigma^{*+} \to \Lambda\pi^+$		$(5 \pm 4) \times 10^{-3}$	
Γ_{61}	$\Lambda\pi^-2\pi^+$ nonresonant		< 1.1 %	CL=90%
Γ_{62}	$\Lambda\pi^-\pi^0 2\pi^+$ total		(2.3 ± 0.8) %	
Γ_{63}	$\Lambda\pi^+\omega$	[a]	(1.5 ± 0.5) %	
Γ_{64}	$\Lambda\pi^-\pi^0 2\pi^+$, no η or ω		$< 8 \times 10^{-3}$	CL=90%
Γ_{65}	$\Lambda\pi^+\eta$	[a]	(1.92 ± 0.06) %	
Γ_{66}	$\Sigma(1385)^+\eta$	[a]	$(6.7 \pm 0.6) \times 10^{-3}$	
Γ_{67}	$\Lambda a_0(980)^+$, $a_0^+ \to \pi^+\eta$		(1.04 ± 0.17) %	
Γ_{68}	$\Lambda(1670)\pi^+$, $\Lambda(1670) \to \Lambda\eta$		$(2.7 \pm 0.6) \times 10^{-3}$	
Γ_{69}	$\Lambda K^+\overline{K}^0$		$(5.9 \pm 0.5) \times 10^{-3}$	S=1.2
Γ_{70}	$\Xi(1690)^0 K^+$, $\Xi^{*0} \to \Lambda\overline{K}^0$		$(1.7 \pm 0.4) \times 10^{-3}$	
Γ_{71}	$\Sigma^0\pi^+$		(1.29 ± 0.05) %	S=1.1
Γ_{72}	$\Sigma^0\pi^+\eta$		$(7.6 \pm 0.8) \times 10^{-3}$	
Γ_{73}	$\Sigma^+\pi^0$		(1.27 ± 0.10) %	S=1.1
Γ_{74}	$\Sigma^+\eta$		$(3.4 \pm 0.4) \times 10^{-3}$	
Γ_{75}	$\Sigma^+\eta'$		$(4.2 \pm 0.9) \times 10^{-3}$	
Γ_{76}	$\Sigma^+\pi^+\pi^-$		(4.57 ± 0.18) %	S=1.1
Γ_{77}	$\Sigma^+\rho^0$		< 1.7 %	CL=95%
Γ_{78}	$\Sigma^-2\pi^+$		(1.87 ± 0.18) %	
Γ_{79}	$\Sigma^0\pi^+\pi^0$		(3.6 ± 0.4) %	
Γ_{80}	$\Sigma^+\pi^0\pi^0$		(1.57 ± 0.14) %	
Γ_{81}	$\Sigma^0\pi^-2\pi^+$		(1.13 ± 0.31) %	
Γ_{82}	$\Sigma^+\omega$		(1.72 ± 0.20) %	
Γ_{83}	$\Sigma^-\pi^0 2\pi^+$		(2.1 ± 0.4) %	
Γ_{84}	$\Sigma^0 K^0_S K^+$		$< 1.28 \times 10^{-3}$	CL=90%
Γ_{85}	$\Sigma^+ K^+ K^-$		$(3.66 \pm 0.35) \times 10^{-3}$	S=1.1
Γ_{86}	$\Sigma^+ K^+ K^-$ (non-ϕ)			
Γ_{87}	$\Sigma^+\phi$	[a]	$(4.0 \pm 0.5) \times 10^{-3}$	S=1.1
Γ_{88}	$\Xi(1690)^0 K^+$, $\Xi^{*0} \to \Sigma^+ K^-$		$(1.03 \pm 0.25) \times 10^{-3}$	
Γ_{89}	$\Sigma^+ K^+ K^-$ nonresonant		$< 8 \times 10^{-4}$	CL=90%
Γ_{90}	$\Xi^0 K^+$		$(5.5 \pm 0.7) \times 10^{-3}$	
Γ_{91}	$\Xi^- K^+\pi^+$		$(6.3 \pm 0.5) \times 10^{-3}$	
Γ_{92}	$\Xi^0 K^+\pi^0$		$(7.8 \pm 1.7) \times 10^{-3}$	

Γ_{93}	$\Xi^0 K^0_S \pi^+$		$(3.7 \pm 0.6) \times 10^{-3}$	
Γ_{94}	$\Xi(1530)^0 K^+$		$(4.9 \pm 0.6) \times 10^{-3}$	S=1.1

Hadronic modes with a hyperon: $S = 0$ final states

Γ_{95}	ΛK^+		$(6.54 \pm 0.30) \times 10^{-4}$	
Γ_{96}	$\Lambda K^+ \pi^0$		$(1.50 \pm 0.29) \times 10^{-3}$	
Γ_{97}	$\Lambda K^0_S \pi^+$		$(1.73 \pm 0.28) \times 10^{-3}$	
Γ_{98}	$\Lambda K^*(892) K^{*+} \to K^0_S \pi^+$		seen	
Γ_{99}	$\Lambda K^+ \pi^+ \pi^-$		$(4.2 \pm 1.6) \times 10^{-4}$	
Γ_{100}	$\Sigma^0 K^+$		$(3.76 \pm 0.31) \times 10^{-4}$	
Γ_{101}	$\Sigma^+ K^0_S$		$(4.8 \pm 1.4) \times 10^{-4}$	
Γ_{102}	$\Sigma^0 K^+ \pi^+ \pi^-$		$< 6.5 \times 10^{-4}$	CL=90%
Γ_{103}	$\Sigma^0 K^+ \pi^0$		$< 5.0 \times 10^{-4}$	CL=90%
Γ_{104}	$\Sigma^+ K^+ \pi^-$		$(2.05 \pm 0.26) \times 10^{-3}$	
Γ_{105}	$\Sigma^+ K^*(892)^0$	[a]	$(3.6 \pm 1.0) \times 10^{-3}$	
Γ_{106}	$\Sigma^+ K^+ \pi^- \pi^0$		$< 1.1 \times 10^{-3}$	CL=90%
Γ_{107}	$\Sigma^- K^+ \pi^+$		$(3.8 \pm 1.2) \times 10^{-4}$	

Doubly Cabibbo-suppressed modes

Γ_{108}	$p K^+ \pi^-$		$(1.13 \pm 0.17) \times 10^{-4}$	

Semileptonic modes

Γ_{109}	$\Lambda e^+ \nu_e$		(3.56 ± 0.13) %	
Γ_{110}	$\Lambda \pi^+ \pi^- e^+ \nu_e$		$< 3.9 \times 10^{-4}$	CL=90%
Γ_{111}	$p K^- e^+ \nu_e$		$(8.8 \pm 1.8) \times 10^{-4}$	
Γ_{112}	$p K^0_S \pi^- e^+ \nu_e$		$< 3.3 \times 10^{-4}$	CL=90%
Γ_{113}	$\Lambda(1520) e^+ \nu_e$		$(1.0 \pm 0.5) \times 10^{-3}$	
Γ_{114}	$\Lambda(1405)^0 e^+ \nu_e,\ \Lambda^0 \to p K^-$		$(4.2 \pm 1.9) \times 10^{-4}$	
Γ_{115}	$\Lambda \mu^+ \nu_\mu$		(3.48 ± 0.17) %	

Inclusive modes

Γ_{116}	e^+ anything		(4.06 ± 0.13) %	
Γ_{117}	p anything		(50 ± 16) %	
Γ_{118}	n anything		(32.6 ± 1.6) %	
Γ_{119}	Λ anything		$(38.2 ^{+2.9}_{-2.4})$ %	
Γ_{120}	K^0_S anything		(10.90 ± 0.22) %	
Γ_{121}	3prongs		(24 ± 8) %	

$\Delta C = 1$ weak neutral current ($C1$) modes, or Lepton Family number (LF), or Lepton number (L), or Baryon number (B) violating modes

Γ_{122}	$p e^+ e^-$	$C1$	$< 5.5 \times 10^{-6}$	CL=90%
Γ_{123}	$p \mu^+ \mu^-$ non-resonant	$C1$	$< 2.9 \times 10^{-8}$	CL=90%
Γ_{124}	$p e^+ \mu^-$	LF	$< 9.9 \times 10^{-6}$	CL=90%
Γ_{125}	$p e^- \mu^+$	LF	$< 1.9 \times 10^{-5}$	CL=90%

Γ_{126}	$\overline{p}2e^+$	L,B	$<$ 2.7	$\times 10^{-6}$	CL=90%
Γ_{127}	$\overline{p}2\mu^+$	L,B	$<$ 9.4	$\times 10^{-6}$	CL=90%
Γ_{128}	$\overline{p}e^+\mu^+$	L,B	$<$ 1.6	$\times 10^{-5}$	CL=90%
Γ_{129}	$\Sigma^-\mu^+\mu^+$	L	$<$ 7.0	$\times 10^{-4}$	CL=90%
	Radiative modes				
Γ_{130}	$\Sigma^+\gamma$		$<$ 2.5	$\times 10^{-4}$	CL=90%
	Exotic modes				
Γ_{131}	$p\gamma_D$		[b] $<$ 8.0	$\times 10^{-5}$	CL=90%

[*a*] This branching fraction includes all the decay modes of the final-state resonance.

[*b*] Here γ_D stands for a dark photon.

FIT INFORMATION

An overall fit to 56 branching ratios uses 87 measurements to determine 26 parameters. The overall fit has a $\chi^2 = 61.2$ for 61 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\left\langle\delta x_i \delta x_j\right\rangle/(\delta x_i \cdot \delta x_j)$, in percent, from the fit to the branching fractions, $x_i \equiv \Gamma_i/\Gamma_{\text{total}}$.

x_{3}	32									
x_{17}	28	67								
x_{23}	64	21	18							
x_{24}	26	45	30	17						
x_{26}	32	37	23	21	47					
x_{34}	12	37	25	8	17	14				
x_{35}	5	15	10	3	7	6	6			
x_{36}	8	24	16	5	11	9	9	4		
x_{45}	8	26	17	5	12	10	10	4	17	
x_{50}	37	35	26	24	19	24	13	5	8	9
x_{52}	32	32	26	20	18	20	12	5	8	8
x_{56}	35	17	10	22	30	51	6	3	4	4
x_{65}	12	37	25	8	17	14	14	6	9	10
x_{69}	8	8	6	5	4	5	3	1	2	2
x_{71}	34	23	17	22	16	24	8	3	5	6
x_{73}	26	21	18	17	9	13	8	3	5	5
x_{76}	30	75	50	20	41	42	28	11	18	19
x_{78}	2	5	4	1	2	2	2	1	1	1
x_{81}	7	8	5	4	7	10	3	1	2	2
x_{82}	9	19	13	6	13	17	7	3	5	5
x_{85}	13	31	21	8	17	17	12	5	7	8
x_{87}	10	24	16	6	13	14	9	4	6	6
x_{90}	3	9	6	2	4	3	3	1	2	2
x_{91}	15	18	13	10	9	10	7	3	4	5
x_{94}	1	3	2	1	1	1	1	0	1	1
	x_{1}	x_{3}	x_{17}	x_{23}	x_{24}	x_{26}	x_{34}	x_{35}	x_{36}	x_{45}

	x_{50}	x_{52}	x_{56}	x_{65}	x_{69}	x_{71}	x_{73}	x_{76}	x_{78}	x_{81}
x_{52}	44									
x_{56}	34	29								
x_{65}	13	12	6							
x_{69}	21	10	7	3						
x_{71}	55	38	34	8	12					
x_{73}	17	20	11	8	4	14				
x_{76}	29	28	24	28	6	20	18			
x_{78}	2	2	1	2	0	1	1	4		
x_{81}	7	6	16	3	1	6	3	7	0	
x_{82}	7	8	11	7	2	6	6	18	1	3
x_{85}	12	12	10	11	3	8	8	42	2	3
x_{87}	9	9	8	9	2	7	6	32	1	2
x_{90}	3	3	2	3	1	2	2	7	0	1
x_{91}	37	17	13	7	8	21	7	14	1	3
x_{94}	1	1	1	1	0	1	1	2	0	0

	x_{82}	x_{85}	x_{87}	x_{90}	x_{91}
x_{85}	7				
x_{87}	6	13			
x_{90}	2	3	2		
x_{91}	4	6	5	2	
x_{94}	1	1	1	0	1

Λ_c^+ BRANCHING RATIOS

A few really obsolete results have been omitted.

Hadronic modes with a p: $S = -1$ final states

$\Gamma(pK^0_S)/\Gamma_{total}$ Γ_1/Γ

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
1.63±0.07 OUR FIT Error includes scale factor of 1.1.				
1.52±0.08±0.03	1243	ABLIKIM 16	BES3	$e^+e^- \to \Lambda_c\overline{\Lambda}_c$, 4.599 GeV

$\Gamma(pK^0_L)/\Gamma_{total}$ Γ_2/Γ

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
1.67±0.06±0.04	1.6k	[1] ABLIKIM 24CQ	BES3	e^+e^- at 4.600–4.699 GeV

[1] Comparing with the PDG 22 value B($\Lambda_c^+ \to pK^0_S$) = $(1.59 \pm 0.07) \times 10^{-2}$, ABLIKIM 24CQ notes the $K^0_S - K^0_L$ splitting to be -0.025 ± 0.031 in these modes.

$\Gamma(pK^0_S)/\Gamma(pK^-\pi^+)$ — Γ_1/Γ_3

Measurements given as a $\overline{K}^0$ ratio have been divided by 2 to convert to a K^0_S ratio.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.255±0.011 OUR FIT Error includes scale factor of 1.3.					
0.234±0.020 OUR AVERAGE					
0.23 ±0.01 ±0.02	1025	ALAM	98	CLE2	$e^+e^- \approx \Upsilon(4S)$
0.22 ±0.04 ±0.03	133	AVERY	91	CLEO	e^+e^- 10.5 GeV
0.28 ±0.09 ±0.07	45	ANJOS	90	E691	γBe 70–260 GeV
0.31 ±0.08 ±0.02	73	ALBRECHT	88C	ARG	e^+e^- 10 GeV

$\Gamma(pK^-\pi^+)/\Gamma_{total}$ — Γ_3/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
6.37±0.21 OUR FIT Error includes scale factor of 1.2.					
6.3 ±0.5 OUR AVERAGE Error includes scale factor of 2.0.					
5.84±0.27±0.23	6.3k	ABLIKIM	16	BES3	$e^+e^- \to \Lambda_c\overline{\Lambda}_c$, 4.599 GeV
$6.84\pm0.24^{+0.21}_{-0.27}$	1.4k	[1] ZUPANC	14	BELL	$e^+e^- \to D^{(*)-}\overline{p}\pi^+$ recoil
• • • We do not use the following data for averages, fits, limits, etc. • • •					
5.0 ±1.3		[2] PDG	02		See footnote

[1] This ZUPANC 14 value is the FIRST-EVER model-independent measurement of a Λ_c^+ branching fraction.

[2] See the note by P. Burchat, "Λ_c^+ Branching Fractions," in any edition of the Review from 2002 through 2014 for how this value was obtained. It is now obsolete.

$\Gamma(p\overline{K}^*_0(700)^0)/\Gamma(pK^-\pi^+)$ — Γ_4/Γ_3

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
3.02±0.16±0.18±0.92	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model.

$\Gamma(p\overline{K}^*(892)^0)/\Gamma(pK^-\pi^+)$ — Γ_5/Γ_3

Unseen decay modes of the $\overline{K}^*(892)^0$ are included.

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
22.3 ± 0.7 OUR AVERAGE					
22.14± 0.23±0.04±0.64		[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV
29 ± 4 ±3		[2] AITALA	00	E791	$\pi^- N$, 500 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$35\ ^{+6}_{-7}$ ±3	39	BOZEK	93	NA32	π^-Cu 230 GeV
35 ±11		BARLAG	90D	NA32	See BOZEK 93
42 ±24	12	BASILE	81B	CNTR	$pp \to \Lambda_c^+ e^- X$

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model.

[2] AITALA 00 makes a coherent 5-dimensional amplitude analysis of 946 ± 38 $\Lambda_c^+ \to pK^-\pi^+$ decays.

$\Gamma(p\overline{K}^*_0(1430))/\Gamma(pK^-\pi^+)$ — Γ_6/Γ_3

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
14.7±0.6±0.1±2.7	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model.

$\Gamma(\Delta(1232)^{++}K^-)/\Gamma(pK^-\pi^+)$ — Γ_7/Γ_3

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
28.2 ± 0.8 OUR AVERAGE					
28.60 ± 0.29 ± 0.16 ± 0.76		[1] AAIJ	23Z	LHCB	1.7 fb^{-1}, pp at 13 TeV
18 ± 3 ± 3		[2] AITALA	00	E791	$\pi^- N$, 500 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
12 $^{+4}_{-5}$ ± 5	14	BOZEK	93	NA32	π^- Cu 230 GeV
40 ± 17	17	BASILE	81B	CNTR	$pp \to \Lambda_c^+ e^- X$

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model.

[2] AITALA 00 makes a coherent 5-dimensional amplitude analysis of 946 ± 38 $\Lambda_c^+ \to pK^-\pi^+$ decays.

$\Gamma(\Delta(1600)^{++}K^-)/\Gamma(pK^-\pi^+)$ — Γ_8/Γ_3

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
4.5±0.3±0.1±1.5	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model.

$\Gamma(\Delta(1700)^{++}K^-)/\Gamma(pK^-\pi^+)$ — Γ_9/Γ_3

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
3.90±0.20±0.07±0.94	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model.

$\Gamma(\Lambda(1405)^0\pi^+)/\Gamma(pK^-\pi^+)$ — Γ_{10}/Γ_3

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
7.7±0.2±0.2±3.0	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model.

$\Gamma(\Lambda(1520)\pi^+)/\Gamma(pK^-\pi^+)$ — Γ_{11}/Γ_3

Unseen decay modes of the $\Lambda(1520)$ are included.

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
1.86± 0.09±0.03±0.23		[1] AAIJ	23Z	LHCB	1.7 fb^{-1}, pp at 13 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
34 ± 8 ± 5		[2] AITALA	00	E791	$\pi^- N$, 500 GeV
40 $^{+18}_{-13}$ ± 9	12	BOZEK	93	NA32	π^- Cu 230 GeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model.

[2] AITALA 00 makes a coherent 5-dimensional amplitude analysis of 946 ± 38 $\Lambda_c^+ \to pK^-\pi^+$ decays.

$\Gamma(\Lambda(1600)\pi^+)/\Gamma(pK^-\pi^+)$ — Γ_{12}/Γ_3

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
5.2±0.2±0.1±1.9	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model.

$\Gamma(\Lambda(1670)\pi^+)/\Gamma(pK^-\pi^+)$ — Γ_{13}/Γ_3

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
1.18±0.06±0.01±0.32	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model.

$\Gamma(\Lambda(1690)\pi^+)/\Gamma(pK^-\pi^+)$ — Γ_{14}/Γ_3

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
1.19±0.09±0.01±0.34	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model.

$\Gamma(\Lambda(2000)\pi^+)/\Gamma(pK^-\pi^+)$ — Γ_{15}/Γ_3

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
9.58±0.27±0.23±0.93	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model.

$\Gamma(pK^-\pi^+\text{ nonresonant})/\Gamma(pK^-\pi^+)$ — Γ_{16}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.55±0.06 OUR AVERAGE					
0.55±0.06±0.04		[1] AITALA	00	E791	π^- N, 500 GeV
$0.56^{+0.07}_{-0.09}\pm0.05$	71	BOZEK	93	NA32	π^- Cu 230 GeV

[1] AITALA 00 makes a coherent 5-dimensional amplitude analysis of 946 ± 38 $\Lambda_c^+ \to pK^-\pi^+$ decays.

$\Gamma(pK^0_S\pi^0)/\Gamma_{total}$ — Γ_{17}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
2.12±0.09 OUR FIT Error includes scale factor of 1.3.					
1.87±0.13±0.05	558	ABLIKIM	16	BES3	$e^+e^- \to \Lambda_c\overline{\Lambda}_c$, 4.599 GeV

$\Gamma(pK^0_L\pi^0)/\Gamma_{total}$ — Γ_{18}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
2.02±0.13±0.05	650	[1] ABLIKIM	24CQ	BES3	e^+e^- at 4.600–4.699 GeV

[1] Comparing with the PDG 22 value B($\Lambda_c^+ \to pK^0_S\pi^0$) = (1.96 ± 0.12) × 10^{-2}, ABLIKIM 24CQ notes the $K^0_S - K^0_L$ splitting to be 0.015 ± 0.046 in these modes.

$\Gamma(pK^0_S\pi^0)/\Gamma(pK^-\pi^+)$ — Γ_{17}/Γ_3

Measurements given as a $\overline{K}^0$ ratio have been divided by 2 to convert to a K^0_S ratio.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.333±0.011 OUR FIT	Error includes scale factor of 1.3.				
0.339±0.009 OUR AVERAGE					
0.339±0.002±0.009	130k	ADACHI	25L	BEL2	e^+e^- at Υ(nS)
0.33 ±0.03 ±0.04	774	ALAM	98	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(nK^0_S\pi^+)/\Gamma_{total}$ — Γ_{19}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
1.86±0.08±0.04	556	ABLIKIM	24BA	BES3	4.5 fb^{-1}, e^+e^- at 4.600–4.699 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.82±0.23±0.11	83	[1] ABLIKIM	17H	BES3	e^+e^- at 4.6 GeV

[1] Superseded by ABLIKIM 24BA.

$\Gamma(nK^0_SK^+)/\Gamma_{total}$ — Γ_{20}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$3.9^{+1.7}_{-1.4}$±0.3	9	ABLIKIM	24BA	BES3	4.5 fb^{-1}, e^+e^- at 4.600–4.699 GeV

$\Gamma(nK^0_S\pi^+\pi^0)/\Gamma_{total}$ — Γ_{21}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
0.85±0.13±0.03	98	ABLIKIM	24AX	BES3	4.5 fb^{-1}, e^+e^- at 4.600–4.699 GeV

$\Gamma(nK^-\pi^+\pi^+)/\Gamma_{total}$ — Γ_{22}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
1.90±0.08±0.09	810	ABLIKIM	23A	BES	4.5 fb^{-1}, e^+e^- at 4.600–4.699 GeV

$\Gamma(p\overline{K}^0\eta)/\Gamma_{total}$ — Γ_{23}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
0.90 ±0.06 OUR FIT	Error includes scale factor of 1.1.				
0.828±0.168±0.056	42	[1] ABLIKIM	21H	BES3	e^+e^- at 4.6 GeV

[1] ABLIKIM 21H measures B($\Lambda_c^+ \to pK^0_S\eta$) = (0.414 ± 0.084 ± 0.028)%.

$\Gamma(p\overline{K}^0\eta)/\Gamma(pK^0_S)$ — Γ_{23}/Γ_1

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.550±0.029 OUR FIT					
0.546±0.012±0.026	12.6k	[1] LI	23B	BELL	$e^+e^- \to \Upsilon$(nS)

[1] LI 23B measures B($\Lambda_c^+ \to pK^0_S\eta$)/B($\Lambda_c^+ \to pK^0_S$) = 0.273 ± 0.006 ± 0.013.

$\Gamma(p\overline{K}^0\eta)/\Gamma(pK^-\pi^+)$ — Γ_{23}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.140±0.009 OUR FIT	Error includes scale factor of 1.1.				
0.25 ±0.04 ±0.04	57	AMMAR	95	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(pK^0_S\pi^+\pi^-)/\Gamma_{total}$ — Γ_{24}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
1.63±0.10 OUR FIT Error includes scale factor of 1.1.					
1.53±0.11±0.09	485	ABLIKIM	16	BES3	$e^+e^- \to \Lambda_c\overline{\Lambda}_c$, 4.599 GeV

$\Gamma(pK^0_L\pi^+\pi^-)/\Gamma_{total}$ — Γ_{25}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
1.69±0.10±0.05	650	[1] ABLIKIM	24CQ	BES3	e^+e^- at 4.600–4.699 GeV

[1] Comparing with the PDG 22 value B($\Lambda_c^+ \to pK^0_S\pi^+\pi^-$) = $(1.60 \pm 0.11) \times 10^{-2}$, ABLIKIM 24CQ notes the $K^0_S - K^0_L$ splitting to be -0.027 ± 0.048 in these modes.

$\Gamma(pK^0_S\pi^+\pi^-)/\Gamma(pK^-\pi^+)$ — Γ_{24}/Γ_3

Measurements given as a $\overline{K}^0$ ratio have been divided by 2 to convert to a K^0_S ratio.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.256±0.014 OUR FIT Error includes scale factor of 1.1.					
0.257±0.031 OUR AVERAGE					
0.26 ±0.02 ±0.03	985	ALAM	98	CLE2	$e^+e^- \approx \Upsilon(4S)$
0.22 ±0.06 ±0.02	83	AVERY	91	CLEO	e^+e^- 10.5 GeV
0.49 ±0.18 ±0.04	12	BARLAG	90D	NA32	π^- 230 GeV

$\Gamma(pK^-\pi^+\pi^0)/\Gamma_{total}$ — Γ_{26}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
4.54±0.27 OUR FIT Error includes scale factor of 1.6.					
4.53±0.23±0.30	1849	ABLIKIM	16	BES3	$e^+e^- \to \Lambda_c\overline{\Lambda}_c$, 4.599 GeV

$\Gamma(pK^-\pi^+\pi^0)/\Gamma(pK^-\pi^+)$ — Γ_{26}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.71 ±0.04 OUR FIT Error includes scale factor of 2.4.					
0.685±0.019 OUR AVERAGE					
0.685±0.007±0.018	242k	PAL	17	BELL	$e^+e^- \approx \Upsilon(4S), \Upsilon(5S)$
0.67 ±0.04 ±0.11	2.6k	ALAM	98	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(pK^*(892)^-\pi^+)/\Gamma(pK^0_S\pi^+\pi^-)$ — Γ_{27}/Γ_{24}

Unseen decay modes of the $K^*(892)^-$ are included.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.88±0.28	17	ALEEV	94	BIS2	nN 20–70 GeV

$\Gamma(p(K^-\pi^+)_{nonresonant}\pi^0)/\Gamma(pK^-\pi^+)$ — Γ_{28}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.73±0.12±0.05	67	BOZEK	93	NA32	π^- Cu 230 GeV

$\Gamma(\Delta(1232)\overline{K}^*(892))/\Gamma_{total}$ — Γ_{29}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
seen	35	AMENDOLIA	87	SPEC	γ Ge-Si

$\Gamma(pK^-2\pi^+\pi^-)/\Gamma(pK^-\pi^+)$ — Γ_{30}/Γ_3

VALUE	DOCUMENT ID		TECN	COMMENT
0.022±0.015	BARLAG	90D	NA32	π^- 230 GeV

$\Gamma(pK^-\pi^+2\pi^0)/\Gamma(pK^-\pi^+)$ — Γ_{31}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.16±0.07±0.03	15	BOZEK	93	NA32	π^- Cu 230 GeV

Hadronic modes with a p and n: $S = 0$ final states

$\Gamma(p\pi^0)/\Gamma_{total}$ — Γ_{32}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$1.56^{+0.72}_{-0.58}\pm0.20$		9	[1] ABLIKIM	24BB	BES3	Superseded by ABLIKIM 25AS
<2.7	90		ABLIKIM	17Q	BES3	e^+e^- at 4.6 GeV

[1] ABLIKIM 24BB result based on 6.0 fb^{-1} of e^+e^- collisions at 4.600–4.843 GeV.

$\Gamma(p\pi^0)/\Gamma(p\eta)$ — Γ_{32}/Γ_{34}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.120±0.026±0.007	80	ABLIKIM	25AS	BES3	4.5 fb^{-1}, e^+e^- at 4.600–4.699 GeV

$\Gamma(p\pi^0)/\Gamma(pK^-\pi^+)$ — Γ_{32}/Γ_3

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<1.273 × 10^{-3}	90	7.7k	[1] LI	21	BELL	e^+e^- at Υ(nS)

[1] Uses B($\pi^0 \to \gamma\gamma$) = 0.9882 ± 0.0003.

$\Gamma(n\pi^+)/\Gamma_{total}$ — Γ_{33}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
6.6±1.2±0.4	50	ABLIKIM	22S	BES3	e^+e^- at 4.612–4.699 GeV

$\Gamma(p\eta)/\Gamma_{total}$ — Γ_{34}/Γ

Unseen decay modes of the η are included.

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.49±0.08 OUR FIT					
1.57±0.11±0.04	507	[1] ABLIKIM	23CB	BES3	4.5 fb^{-1}, e^+e^- at 4.600–4.699 GeV, $\eta\to 2\gamma$, $\pi^+\pi^0\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.63±0.31±0.11	35	ABLIKIM	24BB	BES3	6.0 fb^{-1}, e^+e^- at 4.600–4.843 GeV, $\eta\to 2\gamma$
1.24±0.28±0.10	52	ABLIKIM	17Q	BES3	$\eta\to 2\gamma$, $\pi^+\pi^0\pi^-$

[1] ABLIKIM 23CB report a significance of 10σ.

$\Gamma(p\eta)/\Gamma(pK^-\pi^+)$ — Γ_{34}/Γ_3

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
2.34 ±0.12 OUR FIT					
2.258±0.077±0.122	7.7k	[1] LI	21	BELL	e^+e^- at Υ(nS)

[1] Uses B($\eta \to \gamma\gamma$) = 0.3941 ± 0.0020.

$\Gamma(p\eta)/\Gamma(p\phi)$ — Γ_{34}/Γ_{45}

VALUE	DOCUMENT ID	TECN	COMMENT
1.41±0.18 OUR FIT			
1.6 ±0.7 ±0.2	[1] AAIJ 24AI	LHCB	pp at 13 TeV

[1] AAIJ 24AI reports $[\Gamma(\Lambda_c^+ \to p\eta)/\Gamma(\Lambda_c^+ \to p\phi)] \times [B(\eta \to \mu^+\mu^-)] / [B(\phi(1020) \to \mu^+\mu^-)] = 0.032 \pm 0.013 \pm 0.004$ which we multiply or divide by our best (shown rounded) values $B(\eta \to \mu^+\mu^-) = (5.8 \pm 0.8) \times 10^{-6}$, $B(\phi(1020) \to \mu^+\mu^-) = (2.86 \pm 0.22) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) values.

$\Gamma(p\eta')/\Gamma_{\text{total}}$ — Γ_{35}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
4.9 ±0.9 OUR FIT				
$\mathbf{5.62^{+2.46}_{-2.04}\pm0.26}$	9	[1] ABLIKIM 22AN	BES3	e^+e^- at 4.600–4.699 GeV

[1] Observed with 3.6 σ statistical significance with 4.5 fb^{-1} of e^+e^- collisions between 4.600 and 4.699 GeV. The η' is reconstructed in the two decay modes $\eta' \to \pi^+\pi^-\eta$ and $\eta' \to \pi^+\pi^-\gamma$, with signal yields $4.9^{+3.2}_{-2.6}$ and $4.3^{+2.6}_{-2.2}$ events, respectively.

$\Gamma(p\eta')/\Gamma(pK^-\pi^+)$ — Γ_{35}/Γ_3

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
7.7 ±1.4 OUR FIT			
7.54±1.32±0.73	LI 22B	BELL	e^+e^- at $\Upsilon(nS)$

$\Gamma(p\omega(782)^0)/\Gamma_{\text{total}}$ — Γ_{36}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
9.0±1.0 OUR FIT	Error includes scale factor of 1.2.			
11.1±2.0±0.7	234	[1] ABLIKIM 23CB	BES3	$\omega \to \pi^+\pi^-\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
9.4±3.2±2.2	13	AAIJ 18N	LHCB	Seen in $\Lambda_c^+ \to p\mu^+\mu^-$

[1] ABLIKIM 23CB report a significance of 5.7σ.

$\Gamma(p\omega(782)^0)/\Gamma(pK^-\pi^+)$ — Γ_{36}/Γ_3

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
1.41±0.15 OUR FIT	Error includes scale factor of 1.1.			
1.32±0.12±0.10	1.8k	[1] LI 21E	BELL	e^+e^- at $\Upsilon(nS)$

[1] LI 21E reconstructs the $\omega(782)$ via $\omega \to \pi^+\pi^-\pi^0$ and $\pi^0 \to \gamma\gamma$.

$\Gamma(p\omega(782)^0)/\Gamma(p\phi)$ — Γ_{36}/Γ_{45}

VALUE	DOCUMENT ID	TECN	COMMENT
0.85±0.13 OUR FIT	Error includes scale factor of 1.1.		
0.93±0.14±0.24	[1] AAIJ 24AI	LHCB	pp at 13 TeV

[1] AAIJ 24AI reports $[\Gamma(\Lambda_c^+ \to p\omega(782)^0)/\Gamma(\Lambda_c^+ \to p\phi)] \times [B(\omega(782) \to \mu^+\mu^-)] / [B(\phi(1020) \to \mu^+\mu^-)] = 0.240 \pm 0.030 \pm 0.018$ which we multiply or divide by our best (shown rounded) values $B(\omega(782) \to \mu^+\mu^-) = (7.4 \pm 1.8) \times 10^{-5}$, $B(\phi(1020) \to$

$\mu^+\mu^-$) = (2.86 ± 0.22) × 10^{-4}. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) values.

$\Gamma(p\pi^+\pi^-)/\Gamma(pK^-\pi^+)$ — Γ_{37}/Γ_3

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
7.35±0.24 OUR AVERAGE Error includes scale factor of 1.3.					
7.44±0.08±0.18	20k	AAIJ	18V	LHCB	$\Lambda_b^0 \to \Lambda_c^+\mu^- X$
6.70±0.48±0.25	495	ABLIKIM	16U	BES3	e^+e^- at 4.599 GeV
6.9 ±3.6	5	BARLAG	90D	NA32	π^- 230 GeV

$\Gamma(pf_0(980))/\Gamma(pK^-\pi^+)$ — Γ_{38}/Γ_3

Unseen decay modes of the $f_0(980)$ are included.

VALUE	DOCUMENT ID		TECN	COMMENT
0.055±0.036	BARLAG	90D	NA32	π^- 230 GeV

$\Gamma(p\rho(770)^0)/\Gamma(p\phi)$ — Γ_{39}/Γ_{45}

VALUE	DOCUMENT ID		TECN	COMMENT
1.44±0.35±0.14	[1] AAIJ	24AI	LHCB	pp at 13 TeV

[1] AAIJ 24AI reports $[\Gamma(\Lambda_c^+ \to p\rho(770)^0)/\Gamma(\Lambda_c^+ \to p\phi)] \times [B(\rho(770) \to \mu^+\mu^-)] / [B(\phi(1020) \to \mu^+\mu^-)] = 0.229 \pm 0.051 \pm 0.022$ which we multiply or divide by our best (shown rounded) values $B(\rho(770) \to \mu^+\mu^-) = (4.55 \pm 0.28) \times 10^{-5}$, $B(\phi(1020) \to \mu^+\mu^-) = (2.86 \pm 0.22) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) values.

$\Gamma(n\pi^+\pi^0)/\Gamma_{total}$ — Γ_{40}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
0.64±0.09±0.02	150	ABLIKIM	23A	BES	4.5 fb^{-1}, e^+e^- at 4.600–4.699 GeV

$\Gamma(nK^+\pi^0)/\Gamma_{total}$ — Γ_{41}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<7.1 \times 10^{-4}$	90	ABLIKIM	24AW	BES3	6.1 fb^{-1} at e^+e^-, 4.60–4.84 GeV

$\Gamma(n\pi^+\pi^-\pi^+)/\Gamma_{total}$ — Γ_{42}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
0.45±0.07±0.03	120	ABLIKIM	23A	BES	4.5 fb^{-1}, e^+e^- at 4.600–4.699 GeV

$\Gamma(p2\pi^+2\pi^-)/\Gamma(pK^-\pi^+)$ — Γ_{43}/Γ_3

VALUE	DOCUMENT ID		TECN	COMMENT
0.036±0.023	BARLAG	90D	NA32	π^- 230 GeV

$\Gamma(pK^+K^-)/\Gamma(pK^-\pi^+)$ — Γ_{44}/Γ_3

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
1.70±0.04 OUR AVERAGE					
1.70±0.03±0.03	3.4k	AAIJ	18V	LHCB	$\Lambda_b^0 \to \Lambda_c^+\mu^- X$
1.4 ±0.2 ±0.2	676	ABE	02C	BELL	$e^+e^- \approx \Upsilon(4S)$
3.9 ±0.9 ±0.7	214	ALEXANDER	96C	CLE2	$e^+e^- \approx \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

9.6 ± 2.9 ± 1.0	30	FRABETTI	93H	E687	γ Be, $\overline{E}_\gamma$ 220 GeV
4.8 ± 2.7		BARLAG	90D	NA32	π^- 230 GeV

$\Gamma(p\phi)/\Gamma(pK^-\pi^+)$ Γ_{45}/Γ_3

Unseen decay modes of the ϕ are included.

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
1.66±0.20 OUR FIT					
1.70±0.21 OUR AVERAGE					
1.81 ± 0.33 ± 0.13	44	ABLIKIM	16U	BES3	e^+e^- at 4.599 GeV
1.5 ± 0.2 ± 0.2	345	ABE	02C	BELL	$e^+e^- \approx \Upsilon(4S)$
2.4 ± 0.6 ± 0.3	54	ALEXANDER	96C	CLE2	$e^+e^- \approx \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
4.0 ± 2.7		BARLAG	90D	NA32	π^- 230 GeV

$\Gamma(pK^+K^-\text{ non-}\phi)/\Gamma(pK^-\pi^+)$ Γ_{46}/Γ_3

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
8.4 ±1.8 OUR AVERAGE					
9.36 ± 2.22 ± 0.71	38	ABLIKIM	16U	BES3	e^+e^- at 4.599 GeV
7 ± 2 ± 2	344	ABE	02C	BELL	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(pK^0_S K^0_S)/\Gamma(pK^0_S)$ Γ_{47}/Γ_1

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
1.48±0.08±0.04	2.4k	LI	23B	BELL	$e^+e^- \to \Upsilon(\text{nS})$

$\Gamma(p\phi\pi^0)/\Gamma(pK^-\pi^+)$ Γ_{48}/Γ_3

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
$1.538\pm0.641^{+0.077}_{-0.100}$	PAL	17	BELL	$e^+e^- \approx \Upsilon(4S), \Upsilon(5S)$

$\Gamma(pK^+K^-\pi^0\text{ nonresonant})/\Gamma_{\text{total}}$ Γ_{49}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<6.3\times10^{-5}$	90	PAL	17	BELL	$e^+e^- \approx \Upsilon(4S), \Upsilon(5S)$

—— Hadronic modes with a hyperon: $S = -1$ final states ——

$\Gamma(\Lambda\pi^+)/\Gamma_{\text{total}}$ Γ_{50}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
1.32±0.05 OUR FIT Error includes scale factor of 1.1.					
1.27±0.06 OUR AVERAGE					
1.31 ± 0.08 ± 0.05	376	ABLIKIM	22S	BES3	e^+e^- at 4.612–4.699 GeV
1.24 ± 0.07 ± 0.03	706	ABLIKIM	16	BES3	$e^+e^- \to \Lambda_c\overline{\Lambda}_c$, 4.599 GeV

$\Gamma(\Lambda\pi^+)/\Gamma(pK^-\pi^+)$ Γ_{50}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.207±0.008 OUR FIT Error includes scale factor of 1.2.					
0.204±0.019 OUR AVERAGE					
0.217 ± 0.013 ± 0.020	750	LINK	05F	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV
0.18 ± 0.03 ± 0.04		ALBRECHT	92	ARG	$e^+e^- \approx$ 10.4 GeV
0.18 ± 0.03 ± 0.03	87	AVERY	91	CLEO	e^+e^- 10.5 GeV

$\Gamma\big(\Lambda(1670)\pi^+,\ \Lambda(1670) \to \eta\Lambda\big)/\Gamma\big(pK^-\pi^+\big)$ — Γ_{51}/Γ_3

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
5.54±0.29±0.73	9.7k	LEE	21A	BELL	$e^+e^- \approx \Upsilon$(nS)

$\Gamma\big(\Lambda\pi^+\pi^0\big)/\Gamma_{total}$ — Γ_{52}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
7.16±0.33 OUR FIT					
7.01±0.37±0.19	1497	ABLIKIM	16	BES3	$e^+e^- \to \Lambda_c\overline{\Lambda}_c$, 4.599 GeV

$\Gamma\big(\Lambda\pi^+\pi^0\big)/\Gamma\big(pK^-\pi^+\big)$ — Γ_{52}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.12±0.05 OUR FIT Error includes scale factor of 1.1.					
0.73±0.09±0.16	464	AVERY	94	CLE2	$e^+e^- \approx \Upsilon(3S), \Upsilon(4S)$

$\Gamma\big(\Lambda\rho^+\big)/\Gamma\big(pK^-\pi^+\big)$ — Γ_{53}/Γ_3

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.95	95	AVERY	94	CLE2	$e^+e^- \approx \Upsilon(3S), \Upsilon(4S)$

$\Gamma\big(\Lambda\rho^+\big)/\Gamma\big(\Lambda\pi^+\pi^0\big)$ — Γ_{53}/Γ_{52}

These results are fit fraction from an amplitude / partial wave analysis.

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
57.2±4.2±4.9	8.9k	ABLIKIM	22BA	BES3	e^+e^- at 4.6–4.7 GeV

$\Gamma\big(\Sigma(1385)^+\pi^0,\ \Sigma^+ \to \Lambda\pi^+\big)/\Gamma\big(\Lambda\pi^+\pi^0\big)$ — Γ_{54}/Γ_{52}

These results are fit fraction from an amplitude / partial wave analysis.

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
7.18±0.60±0.64	8.9k	ABLIKIM	22BA	BES3	e^+e^- at 4.6–4.7 GeV

$\Gamma\big(\Sigma(1385)^0\pi^+,\ \Sigma^0 \to \Lambda\pi^0\big)/\Gamma\big(\Lambda\pi^+\pi^0\big)$ — Γ_{55}/Γ_{52}

These results are fit fraction from an amplitude / partial wave analysis.

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
7.92±0.72±0.80	8.9k	ABLIKIM	22BA	BES3	e^+e^- at 4.6–4.7 GeV

$\Gamma\big(\Lambda\pi^-2\pi^+\big)/\Gamma_{total}$ — Γ_{56}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
3.69±0.26 OUR FIT Error includes scale factor of 1.5.					
3.81±0.24±0.18	609	ABLIKIM	16	BES3	$e^+e^- \to \Lambda_c\overline{\Lambda}_c$, 4.599 GeV

$\Gamma\big(\Lambda\pi^-2\pi^+\big)/\Gamma\big(pK^-\pi^+\big)$ — Γ_{56}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.58 ±0.04 OUR FIT Error includes scale factor of 1.7.					
0.522±0.032 OUR AVERAGE					
0.508±0.024±0.024	1356	LINK	05F	FOCS	γ nucleus, $\overline{E}_\gamma \approx 180$ GeV
0.65 ±0.11 ±0.12	289	AVERY	91	CLEO	e^+e^- 10.5 GeV
0.82 ±0.29 ±0.27	44	ANJOS	90	E691	γBe 70–260 GeV
0.94 ±0.41 ±0.13	10	BARLAG	90D	NA32	π^- 230 GeV
0.61 ±0.16 ±0.04	105	ALBRECHT	88C	ARG	e^+e^- 10 GeV

$\Gamma(\Sigma(1385)^+\pi^+\pi^-, \Sigma^{*+} \to \Lambda\pi^+)/\Gamma(\Lambda\pi^-2\pi^+)$ — Γ_{57}/Γ_{56}

VALUE	DOCUMENT ID		TECN	COMMENT
0.28±0.10±0.08	LINK	05F	FOCS	γ nucleus, $\overline{E}_\gamma \approx 180$ GeV

$\Gamma(\Sigma(1385)^-2\pi^+, \Sigma^{*-} \to \Lambda\pi^-)/\Gamma(\Lambda\pi^-2\pi^+)$ — Γ_{58}/Γ_{56}

VALUE	DOCUMENT ID		TECN	COMMENT
0.21±0.03±0.02	LINK	05F	FOCS	γ nucleus, $\overline{E}_\gamma \approx 180$ GeV

$\Gamma(\Lambda\pi^+\rho^0)/\Gamma(\Lambda\pi^-2\pi^+)$ — Γ_{59}/Γ_{56}

VALUE	DOCUMENT ID		TECN	COMMENT
0.40±0.12±0.12	LINK	05F	FOCS	γ nucleus, $\overline{E}_\gamma \approx 180$ GeV

$\Gamma(\Sigma(1385)^+\rho^0, \Sigma^{*+} \to \Lambda\pi^+)/\Gamma(\Lambda\pi^-2\pi^+)$ — Γ_{60}/Γ_{56}

VALUE	DOCUMENT ID		TECN	COMMENT
0.14±0.09±0.07	LINK	05F	FOCS	γ nucleus, $\overline{E}_\gamma \approx 180$ GeV

$\Gamma(\Lambda\pi^-2\pi^+ \text{nonresonant})/\Gamma(\Lambda\pi^-2\pi^+)$ — Γ_{61}/Γ_{56}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.3	90	LINK	05F	FOCS	γ nucleus, $\overline{E}_\gamma \approx 180$ GeV

$\Gamma(\Lambda\pi^-\pi^0 2\pi^+ \text{total})/\Gamma(pK^-\pi^+)$ — Γ_{62}/Γ_3

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.36±0.09±0.09	50	[1] CRONIN-HEN..03	CLE3	$e^+e^- \approx \Upsilon(4S)$

[1] CRONIN-HENNESSY 03 finds this channel to be dominantly $\Lambda\eta\pi^+$ and $\Lambda\omega\pi^+$; see below.

$\Gamma(\Lambda\pi^+\omega)/\Gamma(pK^-\pi^+)$ — Γ_{63}/Γ_3

Unseen decay modes of the ω are included.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.24±0.06±0.06	32	CRONIN-HEN..03	CLE3	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Lambda\pi^-\pi^0 2\pi^+, \text{no } \eta \text{ or } \omega)/\Gamma(pK^-\pi^+)$ — Γ_{64}/Γ_3

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.13	90	CRONIN-HEN..03	CLE3	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Lambda\pi^+\eta)/\Gamma_{\text{total}}$ — Γ_{65}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
1.92±0.06 OUR FIT					
1.94±0.07±0.01	1.3k	ABLIKIM	25AN	BES3	e^+e^-, 4.600–4.843 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.84±0.21±0.15	154	ABLIKIM	19Y	BES3	Superseded by ABLIKIM 25AN

$\Gamma(\Lambda\pi^+\eta)/\Gamma(pK^-\pi^+)$ — Γ_{65}/Γ_3

Unseen decay modes of the η are included.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.301±0.010 OUR FIT					
0.295±0.014 OUR AVERAGE					
0.293±0.003±0.014	51k	LEE	21A	BELL	$e^+e^- \approx \Upsilon(nS)$
0.41 ±0.17 ±0.10	11	CRONIN-HEN..	03	CLE3	$e^+e^- \approx \Upsilon(4S)$
0.35 ±0.05 ±0.06	116	AMMAR	95	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Sigma(1385)^+\eta)/\Gamma_{total}$ — Γ_{66}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.91\pm0.18\pm0.09$	54	ABLIKIM	19Y	BES3	Superseded by ABLIKIM 25AN

$\Gamma(\Sigma(1385)^+\eta)/\Gamma(\Lambda\pi^+\eta)$ — Γ_{66}/Γ_{65}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$0.349\pm0.031\pm0.006$	1.3k	[1,2] ABLIKIM	25AN	BES3	e^+e^-, 4.600–4.843 GeV

[1] ABLIKIM 25AN reports $[\Gamma(\Lambda_c^+ \to \Sigma(1385)^+\eta)/\Gamma(\Lambda_c^+ \to \Lambda\pi^+\eta)] \times [B(\Sigma(1385) \to \Lambda\pi)] = (30.4 \pm 2.6 \pm 0.7) \times 10^{-2}$ which we divide by our best (shown rounded) value $B(\Sigma(1385) \to \Lambda\pi) = (87.0 \pm 1.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] Amplitude analysis of $\Lambda_c^+ \to \Lambda\pi^+\eta$ with four components.

$\Gamma(\Sigma(1385)^+\eta)/\Gamma(pK^-\pi^+)$ — Γ_{66}/Γ_3

Unseen decay modes of the $\Sigma(1385)^+$ and η are included.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.190±0.016 OUR AVERAGE					
$0.192\pm0.006\pm0.016$	29k	LEE	21A	BELL	$e^+e^- \approx \Upsilon(nS)$
$0.17\pm0.04\pm0.03$	54	AMMAR	95	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Lambda a_0(980)^+,\ a_0^+ \to \pi^+\eta)/\Gamma(\Lambda\pi^+\eta)$ — Γ_{67}/Γ_{65}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
$54.0\pm8.4\pm2.6$	1.3k	[1] ABLIKIM	25AN	BES3	e^+e^-, 4.600–4.843 GeV

[1] Amplitude analysis of $\Lambda_c^+ \to \Lambda\pi^+\eta$ with four components.

$\Gamma(\Lambda(1670)\pi^+,\ \Lambda(1670) \to \Lambda\eta)/\Gamma(\Lambda\pi^+\eta)$ — Γ_{68}/Γ_{65}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
$14.1\pm2.8\pm1.2$	1.3k	[1] ABLIKIM	25AN	BES3	e^+e^-, 4.600–4.843 GeV

[1] Amplitude analysis of $\Lambda_c^+ \to \Lambda\pi^+\eta$ with four components.

$\Gamma(\Lambda K^+\overline{K}^0)/\Gamma_{total}$ — Γ_{69}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
5.9 ±0.5 OUR FIT Error includes scale factor of 1.2.					
$6.14\pm0.52\pm0.26$		[1] ABLIKIM	25BN	BES3	e^+e^- at 4.600–4.699 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$6.08\pm0.60\pm0.32$	0.13k	[2] ABLIKIM	25AR	BES3	e^+e^- at 4.600–4.699 GeV, $\Lambda \to p\pi^-$
$6.24\pm0.92\pm0.30$	68	[3] ABLIKIM	25BN	BES3	e^+e^- at 4.600–4.699 GeV, Λ via m^2_{miss}

[1] ABLIKIM 25BN reports $B(\Lambda_c^+ \to \Lambda K^+ K_S^0) = (3.07 \pm 0.26 \pm 0.13) \times 10^{-3}$, which we have multiplied by 2, as a combination of their result with ABLIKIM 25AR, taking into account a small overlap of the two samples.

[2] ABLIKIM 25AR reports $B(\Lambda_c^+ \to \Lambda K^+ K_S^0) = (3.04 \pm 0.30 \pm 0.16) \times 10^{-3}$, which we have multiplied by 2.

[3] ABLIKIM 25BN reports $B(\Lambda_c^+ \to \Lambda K^+ K_S^0) = (3.12 \pm 0.46 \pm 0.15) \times 10^{-3}$, which we have multiplied by 2.

$\Gamma(\Lambda K^+ \overline{K}^0)/\Gamma(p K^- \pi^+)$ — Γ_{69}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.093±0.007 OUR FIT Error includes scale factor of 1.2.					
0.131±0.020 OUR AVERAGE					
0.142±0.018±0.022	251	LINK	05F	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV
0.12 ±0.02 ±0.02	59	AMMAR	95	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Lambda K^+ \overline{K}^0)/\Gamma(\Lambda \pi^+)$ — Γ_{69}/Γ_{50}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.45 ±0.04 OUR FIT Error includes scale factor of 1.2.					
0.395±0.026±0.036	460 ± 30	AUBERT	07U	BABR	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Xi(1690)^0 K^+, \Xi^{*0} \to \Lambda \overline{K}^0)/\Gamma(\Lambda K^+ \overline{K}^0)$ — Γ_{70}/Γ_{69}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.28±0.07 OUR AVERAGE					
0.32±0.10±0.04	84±24	LINK	05F	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV
0.26±0.08±0.03	93	ABE	02C	BELL	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Sigma^0 \pi^+)/\Gamma_{total}$ — Γ_{71}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
1.29±0.05 OUR FIT Error includes scale factor of 1.1.					
1.25±0.07 OUR AVERAGE					
1.22±0.08±0.07	343	ABLIKIM	22S	BES3	e^+e^- at 4.612–4.699 GeV
1.27±0.08±0.03	522	ABLIKIM	16	BES3	$e^+e^- \to \Lambda_c \overline{\Lambda}_c$, 4.599 GeV

$\Gamma(\Sigma^0 \pi^+)/\Gamma(p K^- \pi^+)$ — Γ_{71}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.203±0.009 OUR FIT Error includes scale factor of 1.1.					
0.20 ±0.04 OUR AVERAGE					
0.21 ±0.02 ±0.04	196	AVERY	94	CLE2	$e^+e^- \approx \Upsilon(3S), \Upsilon(4S)$
0.17 ±0.06 ±0.04		ALBRECHT	92	ARG	$e^+e^- \approx$ 10.4 GeV

$\Gamma(\Sigma^0 \pi^+)/\Gamma(\Lambda \pi^+)$ — Γ_{71}/Γ_{50}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.98 ±0.04 OUR FIT					
0.98 ±0.05 OUR AVERAGE					
0.977±0.015±0.051	33k	AUBERT	07U	BABR	$e^+e^- \approx \Upsilon(4S)$
1.09 ±0.11 ±0.19	750	LINK	05F	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma(\Sigma^0 \pi^+ \eta)/\Gamma(p K^- \pi^+)$ — Γ_{72}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.120±0.006±0.010	17k	LEE	21A	BELL	$e^+e^- \approx \Upsilon$(nS)

$\Gamma(\Sigma^+ \pi^0)/\Gamma_{total}$ — Γ_{73}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
1.27±0.10 OUR FIT Error includes scale factor of 1.1.					
1.18±0.10±0.03	309	ABLIKIM	16	BES3	$e^+e^- \to \Lambda_c \overline{\Lambda}_c$, 4.599 GeV

$\Gamma(\Sigma^+\pi^0)/\Gamma(pK^-\pi^+)$ — Γ_{73}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.200±0.015 OUR FIT	Error includes scale factor of 1.1.				
0.20 ±0.03 ±0.03	93	KUBOTA	93	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Sigma^+\eta)/\Gamma(pK^-\pi^+)$ — Γ_{74}/Γ_3

Unseen decay modes of the η are included.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.11±0.03±0.02	26	AMMAR	95	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Sigma^+\eta)/\Gamma(\Sigma^+\pi^0)$ — Γ_{74}/Γ_{73}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.267±0.026 OUR AVERAGE					
0.305±0.046±0.007	122	ABLIKIM	25CO	BES3	e^+e^- at 4.600–4.699 GeV
0.25 ±0.03 ±0.01	700	LI	23A	BELL	e^+e^- at/near Υ(nS), n=1,...,5
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.35 ±0.16 ±0.02	15	[1] ABLIKIM	19X	BES3	Superseded by ABLIKIM 25CO

[1] ABLIKIM 19X report evidence for the observation of the decay $\Lambda_c^+ \rightarrow \Sigma^+\eta$ at 2.5σ significance.

$\Gamma(\Sigma^+\eta')/\Gamma(\Sigma^+\pi^0)$ — Γ_{75}/Γ_{73}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.33±0.06±0.02	300	LI	23A	BELL	e^+e^- at/near Υ(nS), n=1,...,5

$\Gamma(\Sigma^+\eta')/\Gamma(\Sigma^+\omega)$ — Γ_{75}/Γ_{82}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.336±0.094±0.037	22	ABLIKIM	25CO	BES3	e^+e^- at 4.600–4.699 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.86 ±0.34 ±0.04	13	[1] ABLIKIM	19X	BES3	Superseded by ABLIKIM 25CO

[1] ABLIKIM 19X report evidence for the observation of the decay $\Lambda_c^+ \rightarrow \Sigma^+\eta'$ at 3.2σ significance.

$\Gamma(\Sigma^+\pi^+\pi^-)/\Gamma_{total}$ — Γ_{76}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
4.57±0.18 OUR FIT	Error includes scale factor of 1.1.				
4.25±0.24±0.20	1156	ABLIKIM	16	BES3	$e^+e^- \rightarrow \Lambda_c\overline{\Lambda}_c$, 4.599 GeV

$\Gamma(\Sigma^+\pi^+\pi^-)/\Gamma(pK^-\pi^+)$ — Γ_{76}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.716±0.019 OUR FIT					
0.720±0.024 OUR AVERAGE					
0.719±0.003±0.024	2.7M	BERGER	18	BELL	$e^+e^- \approx \Upsilon(4S)$
0.74 ±0.07 ±0.09	487	KUBOTA	93	CLE2	$e^+e^- \approx \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.72 ±0.14	47 ± 9	VAZQUEZ-JA...	08	SELX	Σ^- nucleus, 600 GeV
0.54 $^{+0.18}_{-0.15}$	11	BARLAG	92	NA32	π^- Cu 230 GeV

$\Gamma(\Sigma^+ \rho^0)/\Gamma(pK^-\pi^+)$ — Γ_{77}/Γ_3

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.27	95	KUBOTA	93	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Sigma^- 2\pi^+)/\Gamma_{total}$ — Γ_{78}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
1.87±0.18 OUR FIT					
1.81±0.17±0.09	161	ABLIKIM	17Y	BES3	e^+e^- at 4.6 GeV

$\Gamma(\Sigma^- 2\pi^+)/\Gamma(pK^-\pi^+)$ — Γ_{78}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.294±0.028 OUR FIT					
0.314±0.067	30 ± 6	VAZQUEZ-JA...	08	SELX	Σ^- nucleus, 600 GeV

$\Gamma(\Sigma^- 2\pi^+)/\Gamma(\Sigma^+\pi^+\pi^-)$ — Γ_{78}/Γ_{76}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.41±0.04 OUR FIT					
0.53±0.15±0.07	56	FRABETTI	94E	E687	γ Be, $\overline{E}_\gamma$ 220 GeV

$\Gamma(\Sigma^0\pi^+\pi^0)/\Gamma(pK^-\pi^+)$ — Γ_{79}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.56 ±0.05 OUR AVERAGE	Error includes scale factor of 1.5.				
0.575±0.005±0.036	2.7M	BERGER	18	BELL	$e^+e^- \approx \Upsilon(4S)$
0.36 ±0.09 ±0.10	117	AVERY	94	CLE2	$e^+e^- \approx \Upsilon(3S), \Upsilon(4S)$

$\Gamma(\Sigma^+\pi^0\pi^0)/\Gamma(pK^-\pi^+)$ — Γ_{80}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.247±0.006±0.019	925k	BERGER	18	BELL	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Sigma^0\pi^- 2\pi^+)/\Gamma(pK^-\pi^+)$ — Γ_{81}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.18±0.05 OUR FIT					
0.21±0.05±0.05	90	AVERY	94	CLE2	$e^+e^- \approx \Upsilon(3S), \Upsilon(4S)$

$\Gamma(\Sigma^0\pi^- 2\pi^+)/\Gamma(\Lambda\pi^- 2\pi^+)$ — Γ_{81}/Γ_{56}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.31±0.08 OUR FIT					
0.26±0.06±0.09	480	LINK	05F	FOCS	γ nucleus, $\overline{E}_\gamma \approx 180$ GeV

$\Gamma(\Sigma^+\omega)/\Gamma_{total}$ — Γ_{82}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
1.72±0.20 OUR FIT					
1.56±0.20±0.07	157	ABLIKIM	16	BES3	$e^+e^- \to \Lambda_c \overline{\Lambda}_c$, 4.599 GeV

$\Gamma(\Sigma^+\omega)/\Gamma(pK^-\pi^+)$ — Γ_{82}/Γ_3

Unseen decay modes of the ω are included.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.270±0.030 OUR FIT					
0.54 ±0.13 ±0.06	107	KUBOTA	93	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Sigma^- \pi^0 2\pi^+)/\Gamma_{total}$ — Γ_{83}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
2.11±0.33±0.14	88	ABLIKIM	17Y	BES3	e^+e^- at 4.6 GeV

$\Gamma(\Sigma^0 K^0_S K^+)/\Gamma_{total}$ — Γ_{84}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.28 × 10^{-3}	90	ABLIKIM	25BN	BES3	e^+e^- at 4.600–4.699 GeV, Σ^0 via m^2_{miss}

$\Gamma(\Sigma^+ K^+ K^-)/\Gamma(pK^-\pi^+)$ — Γ_{85}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.057±0.005 OUR FIT					
0.070±0.011±0.011	59	AVERY	93	CLE2	$e^+e^- \approx 10.5$ GeV

$\Gamma(\Sigma^+ K^+ K^-)/\Gamma(\Sigma^+\pi^+\pi^-)$ — Γ_{85}/Γ_{76}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
8.0 ±0.7 OUR FIT					
7.8 ±0.7 OUR AVERAGE					
8.38±0.93±0.44	110	ABLIKIM	23BY	BES3	e^+e^- at 4.600–4.699 GeV
7.6 ±0.7 ±0.9	246	ABE	02C	BELL	$e^+e^- \approx \Upsilon(4S)$
7.1 ±1.1 ±1.1	103	LINK	02G	FOCS	γ nucleus, ≈ 180 GeV

$\Gamma(\Sigma^+ K^+ K^- (\text{non-}\phi))/\Gamma(\Sigma^+\pi^+\pi^-)$ — Γ_{86}/Γ_{76}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
4.38±0.79±0.21	75	[1] ABLIKIM	23BY	BES3	e^+e^- at 4.600–4.699 GeV

[1] We do not include this measurement in our average because it is highly correlated to the relative branching fractions $B(\Lambda_c \to \Sigma^+ K^+ K^-)$ / $B(\Lambda_c \to \Sigma^+\pi^+\pi^-)$ and $B(\Lambda_c \to \Sigma^+\phi)$ / $B(\Lambda_c \to \Sigma^+\pi^+\pi^-)$ measured in the same analysis (which we do use). Although the measurements are done on the same data, ABLIKIM 23BY do not obtain exactly $B(\Lambda_c \to \Sigma^+\phi)\cdot B(\phi \to K^+K^-)$ / $B(\Lambda_c \to \Sigma^+\pi^+\pi^-)$ + $B(\Lambda_c^+ \to \Sigma^+ K^+ K^- (\text{non-}\phi))$ / $B(\Lambda_c \to \Sigma^+\pi^+\pi^-)$ = $B(\Lambda_c \to \Sigma^+ K^+ K^-)$ / $B(\Lambda_c \to \Sigma^+\pi^+\pi^-)$.

$\Gamma(\Sigma^+\phi)/\Gamma(pK^-\pi^+)$ — Γ_{87}/Γ_3

Unseen decay modes of the ϕ are included.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.063±0.007 OUR FIT					
0.069±0.023±0.016	26	AVERY	93	CLE2	$e^+e^- \approx 10.5$ GeV

$\Gamma(\Sigma^+\phi)/\Gamma(\Sigma^+\pi^+\pi^-)$ — Γ_{87}/Γ_{76}

Unseen decay modes of the ϕ are included.

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
8.8±1.0 OUR FIT					
8.8±1.0 OUR AVERAGE					
9.2±1.8±0.7	119	ABLIKIM	23BY	BES3	e^+e^- at 4.600–4.699 GeV
8.5±1.2±1.2	129	ABE	02C	BELL	$e^+e^- \approx \Upsilon(4S)$
8.7±1.6±0.6	57	LINK	02G	FOCS	γ nucleus, ≈ 180 GeV

$\Gamma(\Xi(1690)^0 K^+, \Xi^{*0} \to \Sigma^+ K^-)/\Gamma(\Sigma^+ \pi^+ \pi^-)$ — Γ_{88}/Γ_{76}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.023±0.005 OUR AVERAGE					
0.023±0.005±0.005	75	ABE	02C	BELL	$e^+ e^- \approx \Upsilon(4S)$
0.022±0.006±0.006	34	LINK	02G	FOCS	γ nucleus, $\approx$ 180 GeV

$\Gamma(\Sigma^+ K^+ K^-$ nonresonant$)/\Gamma(\Sigma^+ \pi^+ \pi^-)$ — Γ_{89}/Γ_{76}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.018	90	ABE	02C	BELL	$e^+ e^- \approx \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.028	90	LINK	02G	FOCS	γ nucleus, $\approx$ 180 GeV

$\Gamma(\Xi^0 K^+)/\Gamma_{total}$ — Γ_{90}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
5.5 ±0.7 OUR FIT					
5.90±0.86±0.39	68	ABLIKIM	18Y	BES3	$e^+ e^-$ at 4.6 GeV

$\Gamma(\Xi^0 K^+ \pi^0)/\Gamma_{total}$ — Γ_{92}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
7.79±1.46±0.95	79	ABLIKIM	24AW	BES3	6.1 fb^{-1} at $e^+ e^-$, 4.60–4.84 GeV

$\Gamma(\Xi^0 K^0_S \pi^+)/\Gamma_{total}$ — Γ_{93}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
3.70±0.60±0.21	13	ABLIKIM	25BN	BES3	$e^+ e^-$ at 4.600–4.699 GeV, Ξ^0 via m^2_{miss}

$\Gamma(\Xi^0 K^+)/\Gamma(p K^- \pi^+)$ — Γ_{90}/Γ_3

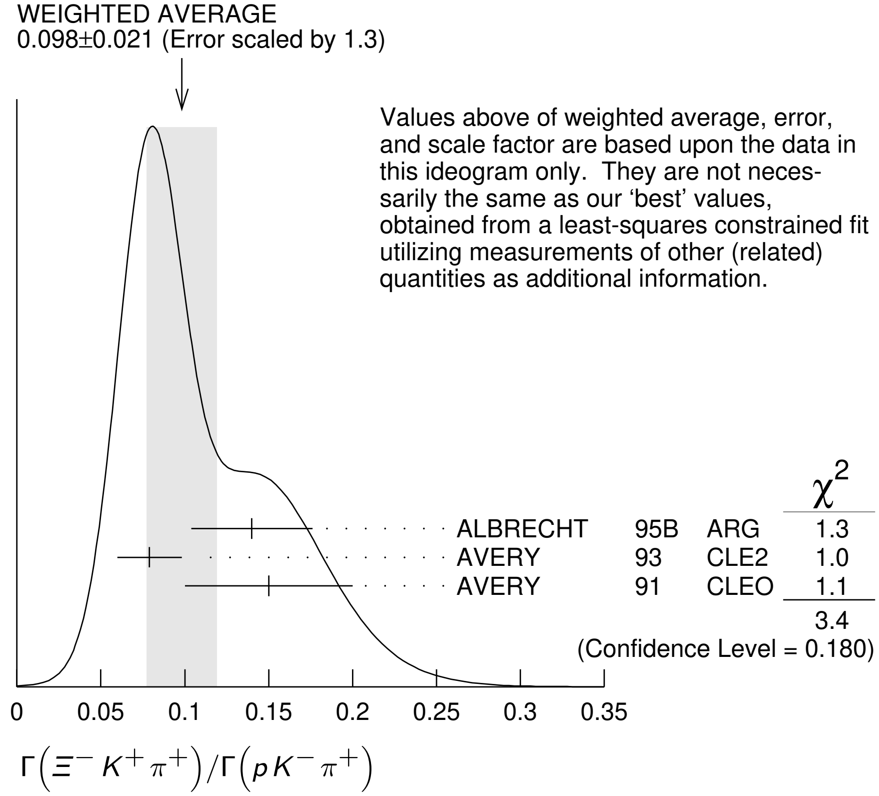
VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.087±0.011 OUR FIT					
0.078±0.013±0.013	56	AVERY	93	CLE2	$e^+ e^- \approx$ 10.5 GeV

$\Gamma(\Xi^- K^+ \pi^+)/\Gamma_{total}$ — Γ_{91}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
7.74±0.76±0.54	128	ABLIKIM	24AY	BES3	4.5 fb^{-1},$e^+ e^-$ at 4.600–4.699 GeV

$\Gamma(\Xi^- K^+ \pi^+)/\Gamma(p K^- \pi^+)$ — Γ_{91}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.099±0.008 OUR FIT					
0.098±0.021 OUR AVERAGE		Error includes scale factor of 1.3. See the ideogram below.			
0.14 ±0.03 ±0.02	34	ALBRECHT	95B	ARG	$e^+ e^- \approx$ 10.4 GeV
0.079±0.013±0.014	60	AVERY	93	CLE2	$e^+ e^- \approx$ 10.5 GeV
0.15 ±0.04 ±0.03	30	AVERY	91	CLEO	$e^+ e^-$ 10.5 GeV



$\Gamma(\Xi^- K^+ \pi^+)/\Gamma(\Lambda \pi^+)$ — Γ_{91}/Γ_{50}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.48 ±0.04 OUR FIT					
0.480±0.016±0.039	2665 ± 84	AUBERT	07U	BABR	$e^+ e^- \approx \Upsilon(4S)$

$\Gamma(\Xi(1530)^0 K^+)/\Gamma_{total}$ — Γ_{94}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
4.9 ±0.6 OUR FIT Error includes scale factor of 1.1.					
5.4 ±0.6 OUR AVERAGE					
5.99±1.04±0.32		ABLIKIM	24AW	BES3	$e^+ e^-$ at 4.60–4.84 GeV, $\Xi(1530) \to \Xi^0 \pi^0$
5.03±0.77±0.20	54	ABLIKIM	24AY	BES3	$e^+ e^-$ at 4.600–4.699 GeV, $\Xi(1530) \to \Xi^- \pi^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
5.02±0.99±0.31	60	ABLIKIM	18Y	BES3	$e^+ e^-$ at 4.6 GeV

$\Gamma(\Xi(1530)^0 K^+)/\Gamma(p K^- \pi^+)$ — Γ_{94}/Γ_3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.077±0.009 OUR FIT					
0.053±0.016±0.010	24	AVERY	93	CLE2	$e^+ e^- \approx 10.5$ GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.05 ±0.02 ±0.01	11	ALBRECHT	95B	ARG	$e^+ e^- \approx 10.4$ GeV

Hadronic modes with a hyperon: $S = 0$ final states

$\Gamma(\Lambda K^+)/\Gamma(\Lambda\pi^+)$ — Γ_{95}/Γ_{50}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
4.96±0.14 OUR AVERAGE					
5.05±0.13±0.09	11k	LI	23C	BELL	e^+e^- at/near Υ(nS), n=1,...,5
4.78±0.34±0.20		ABLIKIM	22BC	BES3	6.44 fb^{-1}, e^+e^- at 4.599–4.950 GeV
4.4 ±0.4 ±0.3	1.1k	AUBERT	07U	BABR	$e^+e^- \approx \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
7.4 ±1.0 ±1.2	265	ABE	02C	BELL	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Lambda K^+\pi^+\pi^-)/\Gamma(\Lambda\pi^+)$ — Γ_{99}/Γ_{50}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<4.1 × 10^{-2}	90	AUBERT	07U	BABR	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Lambda K^+\pi^+\pi^-)/\Gamma(\Lambda\pi^- 2\pi^+)$ — Γ_{99}/Γ_{56}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
1.13±0.41±0.06	ABLIKIM	24AU	BES3	6.4 fb^{-1}, e^+e^- at 4.600–4.950 GeV

$\Gamma(\Lambda K^+\pi^0)/\Gamma(\Lambda\pi^+\pi^0)$ — Γ_{96}/Γ_{52}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
2.09±0.39±0.07	ABLIKIM	24AU	BES3	6.4 fb^{-1}, e^+e^- at 4.600–4.950 GeV

$\Gamma(\Lambda K^+\pi^0)/\Gamma_{\text{total}}$ — Γ_{96}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<2.0\times10^{-3}$	90	ABLIKIM	24AW	BES3	6.1 fb^{-1} at e^+e^-, 4.60–4.84 GeV

$\Gamma(\Lambda K^0_S\pi^+)/\Gamma_{\text{total}}$ — Γ_{97}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.73±0.26±0.10	0.17k	[1] ABLIKIM	25AR	BES3	e^+e^- at 4.600–4.699 GeV, $\Lambda\to p\pi^-$

[1] ABLIKIM 25AR finds evidence of a $\Lambda_c^+ \to \Lambda K^*(892)^+$ resonant contribution at 4.7σ, and estimates the branching fraction for this intermediate decay under three different interference scenarios.

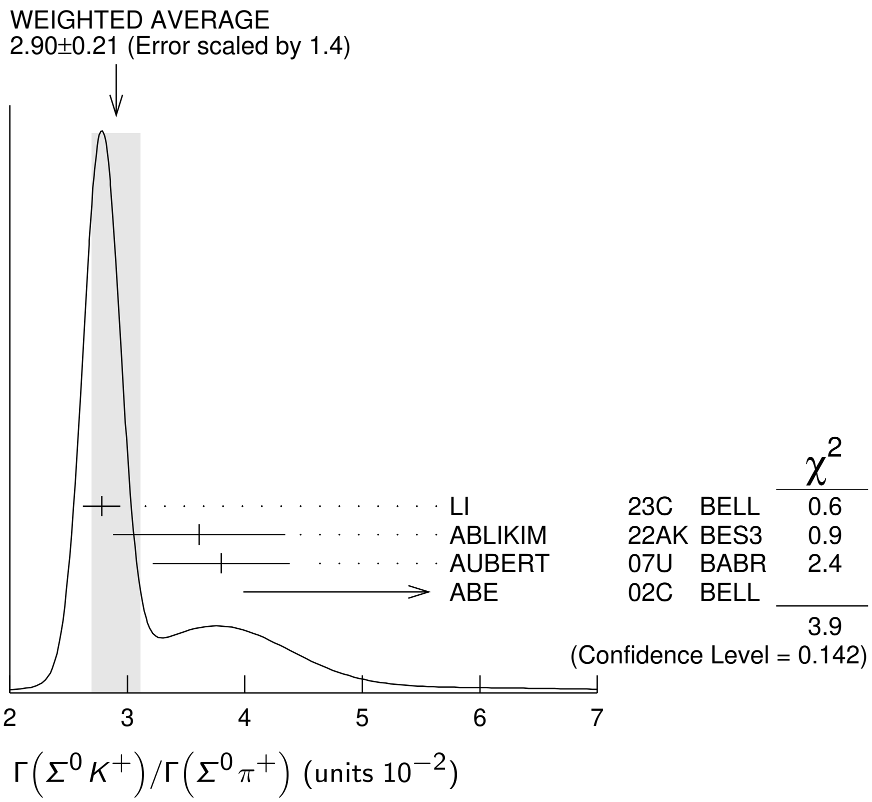
$\Gamma(\Lambda K^*(892) K^{*+} \to K^0_S\pi^+)/\Gamma_{\text{total}}$ — Γ_{98}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
seen	80	[1] ABLIKIM	25AR	BES3	e^+e^- at 4.600–4.699 GeV, $\Lambda\to p\pi^-$

[1] ABLIKIM 25AR finds evidence of a $\Lambda_c^+ \to \Lambda K^*(892)^+$ resonant contribution in $\Lambda_c^+ \to \Lambda K^0_S\pi^+$ at 4.7σ, and estimates the branching fraction for this intermediate decay under three different interference scenarios.

$\Gamma(\Sigma^0 K^+)/\Gamma(\Sigma^0 \pi^+)$ Γ_{100}/Γ_{71}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
2.90±0.21 OUR AVERAGE		Error includes scale factor of 1.4. See the ideogram below.			
2.78±0.15±0.05	2.4k	LI	23C	BELL	e^+e^- at/near Υ(nS), n=1,...,5
3.61±0.73±0.05	43	ABLIKIM	22AK	BES3	e^+e^- at 4.178–4.226 GeV
3.8 ±0.5 ±0.3	366 ± 52	AUBERT	07U	BABR	$e^+e^- \approx \Upsilon(4S)$
5.6 ±1.4 ±0.8	75	ABE	02C	BELL	$e^+e^- \approx \Upsilon(4S)$



$\Gamma(\Sigma^+ K^0_S)/\Gamma(\Sigma^+ \pi^+ \pi^-)$ Γ_{101}/Γ_{76}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
1.06±0.31±0.04	44	ABLIKIM	22AK	BES3	e^+e^- at 4.178–4.226 GeV

$\Gamma(\Sigma^0 K^+ \pi^0)/\Gamma_{total}$ Γ_{103}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<5.0 \times 10^{-4}$	90	[1] ABLIKIM	25BL	BES3	4.5 fb^{-1} e^+e^-, 4.60–4.70 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<1.8 \times 10^{-3}$	90	[2] ABLIKIM	24AW	BES3	6.1 fb^{-1} e^+e^-, 4.60–4.84 GeV

[1] Uses a single-tag method.
[2] Uses a double-tag method.

$\Gamma(\Sigma^0 K^+ \pi^+ \pi^-)/\Gamma_{total}$ Γ_{102}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<6.5 \times 10^{-4}$	90	ABLIKIM	25BL	BES3	4.5 fb^{-1} e^+e^-, 4.60–4.70 GeV

$\Gamma(\Sigma^0 K^+ \pi^+ \pi^-)/\Gamma(\Sigma^0 \pi^+)$ — Γ_{102}/Γ_{71}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<2.0 \times 10^{-2}$	90	AUBERT	07U	BABR	$e^+ e^- \approx \Upsilon(4S)$

$\Gamma(\Sigma^+ K^+ \pi^-)/\Gamma(\Sigma^+ \pi^+ \pi^-)$ — Γ_{104}/Γ_{76}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
4.5 ±0.5 OUR AVERAGE					
4.44±0.52±0.25	224	ABLIKIM	23BY	BES3	$e^+ e^-$ at 4.600–4.699 GeV
4.7 ±1.1 ±0.8	105	ABE	02C	BELL	$e^+ e^- \approx \Upsilon(4S)$

$\Gamma(\Sigma^+ K^*(892)^0)/\Gamma(\Sigma^+ \pi^+ \pi^-)$ — Γ_{105}/Γ_{76}

Unseen decay modes of the $K^*(892)^0$ are included.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.078±0.018±0.013	49	LINK	02G	FOCS	γ nucleus, ≈ 180 GeV

$\Gamma(\Sigma^+ K^+ \pi^- \pi^0)/\Gamma(\Sigma^+ \pi^+ \pi^-)$ — Γ_{106}/Γ_{76}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<2.5 \times 10^{-2}$	90	ABLIKIM	23BY	BES3	$e^+ e^-$ at 4.600–4.699 GeV

$\Gamma(\Sigma^- K^+ \pi^+)/\Gamma(\Sigma^+ K^*(892)^0)$ — $\Gamma_{107}/\Gamma_{105}$

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.35	90	LINK	02G	FOCS	γ nucleus, ≈ 180 GeV

$\Gamma(\Sigma^- K^+ \pi^+)/\Gamma_{total}$ — Γ_{107}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
3.8±1.2±0.2	12	ABLIKIM	24AY	BES3	4.5 fb^{-1}, $e^+ e^-$ at 4.600–4.699 GeV

Doubly Cabibbo-suppressed modes

$\Gamma(p K^+ \pi^-)/\Gamma(p K^- \pi^+)$ — Γ_{108}/Γ_3

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.77±0.27 OUR AVERAGE	Error includes scale factor of 1.9.				
1.65±0.15±0.05	392	AAIJ	18V	LHCB	$\Lambda_b^0 \to \Lambda_c^+ \mu^- X$
2.35±0.27±0.21	3379	YANG	16	BELL	At or near Υs

Semileptonic modes

$\Gamma(\Lambda e^+ \nu_e)/\Gamma_{total}$ — Γ_{109}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
3.56±0.11±0.07		[1] ABLIKIM	22AT	BES3	4.5 fb^{-1} in $e^+ e^-$ at 4.600–4.699 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
3.63±0.38±0.20	104	[2] ABLIKIM	15Y	BES3	567 pb^{-1}, 4.599 GeV

[1] Using Lattice QCD calculations for the form factors yields $|V_{cs}| = 0.936 \pm 0.030$.

[2] Superseded by ABLIKIM 22AT.

$\Gamma(\Lambda e^+ \nu_e)/\Gamma(p K^- \pi^+)$ — Γ_{109}/Γ_3

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.43±0.08	[1,2] BERGFELD	94	CLE2	$e^+ e^- \approx \Upsilon(4S)$

0.38±0.14	[2,3] ALBRECHT	91G	ARG	$e^+e^- \approx 10.4$ GeV

[1] BERGFELD 94 measures $\sigma(e^+e^- \to \Lambda_c^+ X)\cdot B(\Lambda_c^+ \to \Lambda e^+ \nu_e) = (4.87 \pm 0.28 \pm 0.69)$ pb.

[2] To extract $\Gamma(\Lambda_c^+ \to \Lambda e^+ \nu_e)/\Gamma(\Lambda_c^+ \to pK^-\pi^+)$, we use $\sigma(e^+e^- \to \Lambda_c^+ X)\cdot B(\Lambda_c \to pK^-\pi^+) = (11.2 \pm 1.3)$ pb, which is the weighted average of measurements from ARGUS (ALBRECHT 96E) and CLEO (AVERY 91).

[3] ALBRECHT 91G measures $\sigma(e^+e^- \to \Lambda_c^+ X)\cdot B(\Lambda_c^+ \to \Lambda e^+ \nu_e) = (4.20 \pm 1.28 \pm 0.71)$ pb.

$\Gamma(\Lambda\pi^+\pi^- e^+\nu_e)/\Gamma_{total}$ — Γ_{110}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<3.9 × 10^{-4}	90	ABLIKIM	23AB	BES3	4.5 fb^{-1}, e^+e^- at 4.600–4.699 GeV

$\Gamma(pK^- e^+\nu_e)/\Gamma_{total}$ — Γ_{111}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.88±0.17±0.07	ABLIKIM	22BB	BES	4.5 fb^{-1} in e^+e^- at 4.600–4.699 GeV

$\Gamma(pK^0_S\pi^- e^+\nu_e)/\Gamma_{total}$ — Γ_{112}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<3.3 × 10^{-4}	90	ABLIKIM	23AB	BES3	4.5 fb^{-1}, e^+e^- at 4.600–4.699 GeV

$\Gamma(\Lambda(1520)e^+\nu_e)/\Gamma_{total}$ — Γ_{113}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
1.02±0.52±0.11	[1] ABLIKIM	22BB	BES	4.5 fb^{-1} e^+e^- at 4.600–4.699 GeV

[1] ABLIKIM 22BB reports $B(\Lambda_c^+ \to \Lambda(1520)e^+\nu_e)\cdot B(\Lambda(1520) \to pK^-) = (2.3 \pm 1.2 \pm 0.2)\times 10^{-4}$, which is divided by the best value for $B(\Lambda(1520) \to pK^-)$ assuming the isospin limit $2\cdot B(\Lambda(1520) \to pK^-) = B(\Lambda(1520) \to N\overline{K}) = 0.45 \pm 0.01$.

$\Gamma(\Lambda(1405)^0 e^+\nu_e,\ \Lambda^0 \to pK^-)/\Gamma_{total}$ — Γ_{114}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.42±0.19±0.04	ABLIKIM	22BB	BES	4.5 fb^{-1} in e^+e^- at 4.600–4.699 GeV

$\Gamma(\Lambda\mu^+\nu_\mu)/\Gamma_{total}$ — Γ_{115}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
3.48±0.14±0.10	752	ABLIKIM	23AT	BES3	e^+e^- at 4.600–4.699 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
3.49±0.46±0.27	79	[1] ABLIKIM	17D	BES3	e^+e^- at 4.6 GeV

[1] Superseded by ABLIKIM 23AT.

$\Gamma(\Lambda\mu^+\nu_\mu)/\Gamma(pK^-\pi^+)$ — Γ_{115}/Γ_3

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.40±0.09	[1,2] BERGFELD	94	CLE2	$e^+e^- \approx \Upsilon(4S)$
0.35±0.20	[2,3] ALBRECHT	91G	ARG	$e^+e^- \approx 10.4$ GeV

[1] BERGFELD 94 measures $\sigma(e^+ e^- \to \Lambda_c^+ X)\cdot B(\Lambda_c^+ \to \Lambda \mu^+ \nu_\mu) = (4.43 \pm 0.51 \pm 0.64)$ pb.
[2] To extract $\Gamma(\Lambda_c^+ \to \Lambda \mu^+ \nu_\mu)/\Gamma(\Lambda_c^+ \to p K^- \pi^+)$, we use $\sigma(e^+ e^- \to \Lambda_c^+ X)\cdot B(\Lambda_c \to p K^- \pi^+) = (11.2 \pm 1.3)$ pb, which is the weighted average of measurements from ARGUS (ALBRECHT 96E) and CLEO (AVERY 91).
[3] ALBRECHT 91G measures $\sigma(e^+ e^- \to \Lambda_c^+ X)\cdot B(\Lambda_c^+ \to \Lambda \mu^+ \nu_\mu) = (3.91 \pm 2.02 \pm 0.90)$ pb.

$\Gamma(\Lambda \mu^+ \nu_\mu)/\Gamma(\Lambda e^+ \nu_e)$ — $\Gamma_{115}/\Gamma_{109}$

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.96 \pm 0.16 \pm 0.04$	[1] ABLIKIM	17D	BES3	$e^+ e^-$ at 4.6 GeV

[1] This is the ratio of the ABLIKIM 17D $\Lambda \mu^+ \nu_e$ branching fraction and the ABLIKIM 15Y $\Lambda e^+ \nu_e$ branching fraction (see above), and so is not an independent measurement.

Inclusive modes

$\Gamma(e^+ \text{anything})/\Gamma_{total}$ — Γ_{116}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
$4.06 \pm 0.10 \pm 0.09$	4692	ABLIKIM	23AK	BES3	$e^+ e^-$ at 4.6–4.698 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$3.95 \pm 0.34 \pm 0.09$	214	[1] ABLIKIM	18AF	BES3	$e^+ e^-$ 4.6 GeV

[1] Superseded by ABLIKIM 23AK.

$\Gamma(p \text{ anything})/\Gamma_{total}$ — Γ_{117}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$0.50 \pm 0.08 \pm 0.14$	[1] CRAWFORD	92	CLEO	$e^+ e^-$ 10.5 GeV

[1] This CRAWFORD 92 value includes protons from Λ decay. The value is model dependent, but account is taken of this in the systematic error.

$\Gamma(n \text{ anything})/\Gamma_{total}$ — Γ_{118}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
32.6 ± 1.6 OUR AVERAGE					
$32.4 \pm 0.7 \pm 1.5$	3105	[1] ABLIKIM	23AS	BES3	$e^+ e^-$ at 4.6–4.698 GeV
$50 \pm 8 \pm 14$		[2] CRAWFORD	92	CLEO	$e^+ e^-$ 10.5 GeV

[1] ABLIKIM 23AS measures the antiparticle decay $\overline{\Lambda}_c^- \to \overline{n} X$.
[2] This CRAWFORD 92 value includes neutrons from Λ decay. The value is model dependent, but account is taken of this in the systematic error.

$\Gamma(\Lambda \text{ anything})/\Gamma_{total}$ — Γ_{119}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
$38.2^{+2.8}_{-2.2} \pm 0.9$	700	ABLIKIM	18E	BES3	$e^+ e^-$ at 4.6 GeV

$\Gamma(K_S^0 \text{ anything})/\Gamma_{total}$ — Γ_{120}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
$10.9 \pm 0.2 \pm 0.1$	4.9k	ABLIKIM	25BH	BES3	$e^+ e^-$ at 4.600–4.699 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$9.9 \pm 0.6 \pm 0.4$	478	[1] ABLIKIM	20AJ	BES3	$e^+ e^-$ at 4.6 GeV

[1] Superseded by ABLIKIM 25BH.

$\Gamma(\text{3prongs})/\Gamma_{\text{total}}$ — Γ_{121}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.24±0.07±0.04	KAYIS-TOPAK.03	CHRS	ν_μ emulsion, $\overline{E}$=27 GeV

Rare or forbidden modes

$\Gamma(p e^+ e^-)/\Gamma_{\text{total}}$ — Γ_{122}/Γ

A test for the ΔC=1 weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<5.5 × 10^{-6}	90	4.0 ± 7.1	LEES	11G	BABR	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(p \mu^+ \mu^-$ non-resonant$)/\Gamma_{\text{total}}$ — Γ_{123}/Γ

A test for the ΔC=1 weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<2.9 × 10^{-8}	90	[1] AAIJ	24AI	LHCB	pp at 13 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<7.7 \times 10^{-8}$	90	[2] AAIJ	18N	LHCB	pp at 7,8 TeV
$<4.4 \times 10^{-5}$	90	LEES	11G	BABR	$e^+e^- \approx \Upsilon(4S)$
$<3.4 \times 10^{-4}$	90	KODAMA	95	E653	π^- emulsion 600 GeV

[1] AAIJ 24AI measures B($\Lambda_c^+ \to p\mu^+\mu^-$ non-res)/B($\Lambda_c^+ \to p\phi,\ \phi \to \mu^+\mu^-$) < 0.09 (0.10) at 90% (95%) CL corresponding to a limit of 2.9 (3.2) 10^{-8}.

[2] AAIJ 18N measures ratio to $\Lambda_c^+ \to p\phi,\ \phi \to \mu^+\mu^-$.

$\Gamma(p e^+ \mu^-)/\Gamma_{\text{total}}$ — Γ_{124}/Γ

A test of lepton family-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<9.9 × 10^{-6}	90	-0.7 ± 3.0	LEES	11G	BABR	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(p e^- \mu^+)/\Gamma_{\text{total}}$ — Γ_{125}/Γ

A test of lepton family-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<19 × 10^{-6}	90	6.2 ± 4.9	LEES	11G	BABR	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\overline{p} 2e^+)/\Gamma_{\text{total}}$ — Γ_{126}/Γ

A test of lepton- and baryon-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<2.7 × 10^{-6}	90	-1.5 ± 4.5	LEES	11G	BABR	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\overline{p} 2\mu^+)/\Gamma_{\text{total}}$ — Γ_{127}/Γ

A test of lepton- and baryon-number conservation and of lepton family-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<9.4 × 10^{-6}	90	0.0 ± 2.2	LEES	11G	BABR	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\overline{p} e^+ \mu^+)/\Gamma_{\text{total}}$ — Γ_{128}/Γ

A test of lepton- and baryon-number conservation and of lepton family-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<16 × 10^{-6}	90	10.1 ± 6.8	LEES	11G	BABR	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Sigma^- \mu^+ \mu^+)/\Gamma_{total}$ — Γ_{129}/Γ

A test of lepton-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<7.0 × 10^{-4}	90	0	KODAMA	95	E653	π^- emulsion 600 GeV

$\Gamma(\Sigma^+ \gamma)/\Gamma_{total}$ — Γ_{130}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<4.4 \times 10^{-4}$	90	ABLIKIM	23Z	BES3	$e^+ e^-$ at 4.600–4.699 GeV

Radiative modes

$\Gamma(\Sigma^+ \gamma)/\Gamma(p K^- \pi^+)$ — Γ_{130}/Γ_3

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<4.0 × 10^{-3}	90	LI	23	BELL	$e^+ e^- \to \Upsilon$(nS)

Exotic modes

$\Gamma(p \gamma_D)/\Gamma_{total}$ — Γ_{131}/Γ

Here γ_D stands for a dark photon.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<8.0 × 10^{-5}	90	ABLIKIM	22AR	BES	4.5 fb^{-1} $e^+ e^-$ at 4.600–4.699 GeV

Λ_c^+ DECAY PARAMETERS

See the review on "Baryon Decay Parameters."

α FOR $\Lambda_c^+ \to \Lambda \pi^+$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.768±0.015 OUR AVERAGE		Error includes scale factor of 3.4.			
−0.785±0.006±0.003	26k	[1] AAIJ	24AH	LHCB	pp at 13 TeV
−0.755±0.005±0.003	264k	[2] LI	23C	BELL	$e^+ e^- \approx \Upsilon$(nS), n=1,...,5
−0.80 ±0.11 ±0.02		ABLIKIM	19AX	BES3	$e^+ e^-$ at 4.6 GeV
−0.78 ±0.16 ±0.19		LINK	06A	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV
−0.94 ±0.21 ±0.12	414	[3] BISHAI	95	CLE2	$e^+ e^- \approx \Upsilon(4S)$
−0.96 ±0.42		ALBRECHT	92	ARG	$e^+ e^- \approx$ 10.4 GeV
−1.1 ±0.4	86	AVERY	90B	CLEO	$e^+ e^- \approx$ 10.6 GeV

[1] AAIJ 24AH also reports the measurements of the decay parameters β and γ, the phase difference Δ, the *CP* asymmetry R_β and the *CP* average R'_β for $\Lambda_c \to \Lambda\pi$ and its charge-conjugated decay.

[2] LI 23C obtained the value by a fit for the product $\alpha \times \alpha_\Lambda^{avg}$, and dividing by the value $\alpha_\Lambda^{avg} = 0.7542 \pm 0.0026$ reported in ABLIKIM 22AG.

[3] BISHAI 95 actually gives $\alpha = -0.94^{+0.21}_{-0.06}{}^{+0.12}_{-0.06}$, chopping the errors at the physical limit −1.0. However, for $\alpha \approx -1.0$, some experiments should *get* unphysical values ($\alpha < -1.0$), and for averaging with other measurements such values (or errors that extend below −1.0) should *not* be chopped.

α FOR $\Lambda_c^+ \to \Lambda \rho^+$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.763±0.053±0.045	8.9k	ABLIKIM	22BA	BES3	$e^+ e^-$ at 4.6–4.7 GeV

α FOR $\Lambda_c^+ \to \Sigma^+ \pi^0$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.484±0.027 OUR AVERAGE					
−0.48 ±0.02 ±0.02	7k	LI	23A	BELL	e^+e^- at/near Υ(nS), n=1,...,5
−0.57 ±0.10 ±0.07		ABLIKIM	19AX	BES3	e^+e^- at 4.6 GeV
−0.45 ±0.31 ±0.06	89	BISHAI	95	CLE2	$e^+e^- \approx \Upsilon(4S)$

α FOR $\Lambda_c^+ \to \Sigma^+ \eta$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.99±0.03±0.05	700	LI	23A	BELL	e^+e^- at/near Υ(nS), n=1,...,5

α FOR $\Lambda_c^+ \to \Sigma^+ \eta'$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.46±0.06±0.03	300	LI	23A	BELL	e^+e^- at/near Υ(nS), n=1,...,5

α FOR $\Lambda_c^+ \to \Sigma^0 \pi^+$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.466±0.018 OUR AVERAGE					
−0.463±0.016±0.008	105k	[1] LI	23C	BELL	e^+e^- at/near Υ(nS), n=1,...,5
−0.73 ±0.17 ±0.07		ABLIKIM	19AX	BES3	e^+e^- at 4.6 GeV

[1] LI 23C obtained the value by a fit for the product $\alpha \times \alpha_{\Lambda}^{avg}$, and dividing by the value α_{Λ}^{avg} = 0.7542 ± 0.0026 reported in ABLIKIM 22AG.

α FOR $\Lambda_c^+ \to \Sigma(1385)^+ \pi^0$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.917±0.069±0.056	8.9k	ABLIKIM	22BA	BES3	e^+e^- at 4.6–4.7 GeV

α FOR $\Lambda_c^+ \to \Sigma(1385)^0 \pi^+$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.789±0.098±0.056	8.9k	ABLIKIM	22BA	BES3	e^+e^- at 4.6–4.7 GeV

α FOR $\Lambda_c^+ \to \Lambda \ell^+ \nu_\ell$

The experiments don't cover the complete (or same incomplete) $M(\Lambda\ell^+)$ range, but we average them together anyway.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.875±0.033 OUR AVERAGE					
−0.94 ±0.07 ±0.03	752	[1] ABLIKIM	23AT	BES3	e^+e^-, 4.600–4.699 GeV
−0.86 ±0.03 ±0.02	3201	[2] HINSON	05	CLEO	$e^+e^- \approx \Upsilon(4S)$
−0.91 ±0.42 ±0.25		[3] ALBRECHT	94B	ARG	$e^+e^- \approx$ 10 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$-0.82\ ^{+0.09}_{-0.06}\ ^{+0.06}_{-0.03}$	700	[4] CRAWFORD	95	CLE2	See HINSON 05
$-0.89\ ^{+0.17}_{-0.11}\ ^{+0.09}_{-0.05}$	350	[5] BERGFELD	94	CLE2	See CRAWFORD 95

[1] ABLIKIM 23AT measures α of $\Lambda_c^+ \to \Lambda \mu^+ \nu_\mu$ decay over eight q^2 bins from zero to the kinematic endpoint. The value provided here is $\langle \alpha \rangle$, averaged over q^2. The analysis uses form factors extracted from a simultaneous fit to electron and muon mode data.

[2] HINSON 05 measures the form-factor ratio $R \equiv f_2/f_1$ for $\Lambda_c^+ \rightarrow \Lambda e^+ \nu_e$ events to be $-0.31 \pm 0.05 \pm 0.04$ and the pole mass to be $2.21 \pm 0.08 \pm 0.14$ GeV/c^2, and from these calculates α, averaged over q^2, where $\langle q^2 \rangle = 0.67$ (GeV/c)^2.
[3] ALBRECHT 94B uses Λe^+ and $\Lambda \mu^+$ events in the mass range $1.85 < M(\Lambda \ell^+) < 2.20$ GeV.
[4] CRAWFORD 95 measures the form-factor ratio $R \equiv f_2/f_1$ for $\Lambda_c^+ \rightarrow \Lambda e^+ \nu_e$ events to be $-0.25 \pm 0.14 \pm 0.08$ and from this calculates α, averaged over q^2, to be the above.
[5] BERGFELD 94 uses Λe^+ events.

α FOR $\Lambda_c^+ \rightarrow pK_S^0$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$-0.754 \pm 0.008 \pm 0.006$	90k	AAIJ	24AH	LHCB	pp at 13 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.18 \pm 0.43 \pm 0.14$		ABLIKIM	19AX	BES3	e^+e^- at 4.6 GeV

α FOR $\Lambda_c^+ \rightarrow \Lambda K^+$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
-0.546 ± 0.035 OUR AVERAGE					
$-0.516 \pm 0.041 \pm 0.021$	1k	[1] AAIJ	24AH	LHCB	pp at 13 TeV
$-0.585 \pm 0.049 \pm 0.018$	11k	[2] LI	23C	BELL	$e^+e^- \approx \Upsilon$(nS), n=1,...,5

[1] AAIJ 24AH also reports the measurements of the decay parameters β and γ, the phase difference Δ, the *CP* asymmetry R_β and the *CP* average R'_β for $\Lambda_c \rightarrow \Lambda K$ and its charge-conjugated decay.
[2] LI 23C obtained the value by a fit for the product $\alpha \times \alpha_\Lambda^{avg}$, and dividing by the value $\alpha_\Lambda^{avg} = 0.7542 \pm 0.0026$ reported in ABLIKIM 22AG.

α FOR $\Lambda_c^+ \rightarrow \Sigma^0 K^+$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$-0.54 \pm 0.18 \pm 0.09$	2.4k	[1] LI	23C	BELL	e^+e^- at/near Υ(nS), n=1,...,5

[1] LI 23C obtained the value by a fit for the product $\alpha \times \alpha_\Lambda^{avg}$, and dividing by the value $\alpha_\Lambda^{avg} = 0.7542 \pm 0.0026$ reported in ABLIKIM 22AG.

α FOR $\Lambda_c^+ \rightarrow \Lambda(1405)\pi^+$

The polarization is defined with respect to the daughter baryon momentum in the parent rest frame. See "Baryon Decay Parameters" review.

VALUE	DOCUMENT ID		TECN	COMMENT
$0.58 \pm 0.05 \pm 0.01 \pm 0.28$	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \rightarrow pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model. Sign determined per authors; see also AAIJ 23AJ.

α FOR $\Lambda_c^+ \rightarrow \Lambda(1520)\pi^+$

The polarization is defined with respect to the daughter baryon momentum in the parent rest frame. See "Baryon Decay Parameters" review.

VALUE	DOCUMENT ID		TECN	COMMENT
$0.925 \pm 0.025 \pm 0.005 \pm 0.084$	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \rightarrow pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model. Sign determined per authors; see also AAIJ 23AJ.

α FOR $\Lambda_c^+ \to \Lambda(1600)\pi^+$

The polarization is defined with respect to the daughter baryon momentum in the parent rest frame. See "Baryon Decay Parameters" review.

VALUE	DOCUMENT ID		TECN	COMMENT
0.20±0.06±0.03±0.50	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model. Sign determined per authors; see also AAIJ 23AJ.

α FOR $\Lambda_c^+ \to \Lambda(1670)\pi^+$

The polarization is defined with respect to the daughter baryon momentum in the parent rest frame. See "Baryon Decay Parameters" review.

VALUE	DOCUMENT ID		TECN	COMMENT
0.817±0.042±0.006±0.073	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model. Sign determined per authors; see also AAIJ 23AJ.

α FOR $\Lambda_c^+ \to \Lambda(1690)\pi^+$

The polarization is defined with respect to the daughter baryon momentum in the parent rest frame. See "Baryon Decay Parameters" review.

VALUE	DOCUMENT ID		TECN	COMMENT
0.958±0.020±0.006±0.027	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model. Sign determined per authors; see also AAIJ 23AJ.

α FOR $\Lambda_c^+ \to \Lambda(2000)\pi^+$

VALUE	DOCUMENT ID		TECN	COMMENT
−0.57±0.03±0.01±0.19	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model. Sign determined per authors; see also AAIJ 23AJ.

α FOR $\Lambda_c^+ \to \Delta(1232)^{++}K^-$

The polarization is defined with respect to the daughter baryon momentum in the parent rest frame. See "Baryon Decay Parameters" review.

VALUE	DOCUMENT ID		TECN	COMMENT
0.548±0.014±0.004±0.036	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model. Sign determined per authors; see also AAIJ 23AJ.

α FOR $\Lambda_c^+ \to \Delta(1600)^{++}K^-$

The polarization is defined with respect to the daughter baryon momentum in the parent rest frame. See "Baryon Decay Parameters" review.

VALUE	DOCUMENT ID		TECN	COMMENT
−0.50±0.05±0.01±0.17	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model. Sign determined per authors; see also AAIJ 23AJ.

α FOR $\Lambda_c^+ \to \Delta(1700)^{++}K^-$

The polarization is defined with respect to the daughter baryon momentum in the parent rest frame. See "Baryon Decay Parameters" review.

VALUE	DOCUMENT ID		TECN	COMMENT
0.216±0.036±0.011±0.075	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model. Sign determined per authors; see also AAIJ 23AJ.

α FOR $\Lambda_c^+ \to \overline{K}_0^*(700)^0 p$

The polarization is defined with respect to the daughter baryon momentum in the parent rest frame. See "Baryon Decay Parameters" review.

VALUE	DOCUMENT ID		TECN	COMMENT
−0.06±0.66±0.23±0.24	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model. Sign determined per authors; see also AAIJ 23AJ.

α FOR $\Lambda_c^+ \to \overline{K}_0^*(1430)^0 p$

The polarization is defined with respect to the daughter baryon momentum in the parent rest frame. See "Baryon Decay Parameters" review.

VALUE	DOCUMENT ID		TECN	COMMENT
0.34±0.03±0.01±0.14	[1] AAIJ	23Z	LHCB	1.7fb^{-1}, pp at 13 TeV

[1] AAIJ 23Z uses an amplitude analysis of 400k $\Lambda_c \to pK^-\pi^+$ decays, the last uncertainty is due to the amplitude model. Sign determined per authors; see also AAIJ 23AJ.

α FOR $\Lambda_c^+ \to \Xi^0 K^+$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.01±0.16±0.03	378	[1] ABLIKIM	24AP	BES3	4.4 fb^{-1}, e^+e^- at 4.60–4.70 GeV

[1] ABLIKIM 24AP report the phase shift between P- and S-wave amplitudes has two solutions, which are δ_P - δ_S = −1.55 ± 0.25 ± 0.05 rad and 1.59 ± 0.25 ± 0.05 rad.

Λ_c^+, $\overline{\Lambda}_c^-$ CP-VIOLATING DECAY ASYMMETRIES

$(\alpha + \overline{\alpha})/(\alpha - \overline{\alpha})$ in $\Lambda_c^+ \to \Lambda\pi^+$, $\overline{\Lambda}_c^- \to \overline{\Lambda}\pi^-$

This is zero if CP is conserved.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.020±0.016 OUR AVERAGE					
0.020±0.007±0.014	264k	LI	23C	BELL	e^+e^- at/near Υ(nS), n=1,...,5
−0.07 ±0.19 ±0.24		LINK	06A	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV

$(\alpha + \overline{\alpha})/(\alpha - \overline{\alpha})$ in $\Lambda_c^+ \to \Sigma^0\pi^+$, $\overline{\Lambda}_c^- \to \overline{\Sigma}^0\pi^-$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.023±0.034±0.030	105k	LI	23C	BELL	e^+e^- at/near Υ(nS), n=1,...,5

$(\alpha + \overline{\alpha})/(\alpha - \overline{\alpha})$ in $\Lambda_c^+ \to \Lambda e^+\nu_e$, $\overline{\Lambda}_c^- \to \overline{\Lambda} e^-\overline{\nu}_e$

This is zero if CP is conserved.

VALUE	DOCUMENT ID		TECN	COMMENT
0.00±0.03±0.02	HINSON	05	CLEO	$e^+e^- \approx \Upsilon(4S)$

$(\alpha + \overline{\alpha})/(\alpha - \overline{\alpha})$ in $\Lambda_c^+ \to \Lambda K^+$, $\overline{\Lambda}_c^- \to \overline{\Lambda} K^-$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.023±0.086±0.071	11k	LI	23C	BELL	e^+e^- at/near Υ(nS), n=1,...,5

$(\alpha + \overline{\alpha})/(\alpha - \overline{\alpha})$ in $\Lambda_c^+ \to \Sigma^0 K^+$, $\overline{\Lambda}_c^- \to \overline{\Sigma}^0 K^-$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.08±0.35±0.14	2.4k	LI	23C	BELL	e^+e^- at/near Υ(nS), n=1,...,5

$A_{CP}(\Lambda X)$ in $\Lambda_c \to \Lambda X$, $\overline{\Lambda}_c \to \overline{\Lambda} X$

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{2.1^{+7.0}_{-6.6}\pm1.6}$	700	ABLIKIM	18E	BES3	e^+e^- at 4.6 GeV

$A_{CP}(\Lambda K^+)$ in $\Lambda_c \to \Lambda K^+$, $\overline{\Lambda}_c \to \overline{\Lambda} K^-$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.021±0.026±0.001	11k	LI	23C	BELL	e^+e^- at/near Υ(nS), n=1,...,5

$A_{CP}(\Sigma^0 K^+)$ in $\Lambda_c \to \Sigma^0 K^+$, $\overline{\Lambda}_c \to \overline{\Sigma}^0 K^-$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.025±0.054±0.004	2.4k	LI	23C	BELL	e^+e^- at/near Υ(nS), n=1,...,5

$A_{CP}(p\mu^+\mu^-)$ in $\Lambda_c^+ \to p\mu^+\mu^-$, $\overline{\Lambda}_c^- \to \overline{p}\mu^+\mu^-$

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
−1.1±4.0±0.5	0.78k	[1] AAIJ	25N	LHCB	pp at 13 TeV

[1] AAIJ 25N measures A_{CP} only in the dimuon mass range close to the ϕ resonance, $m_{\mu\mu}$ = 979.46–1059.46 MeV. Also reports, in the same mass range, the *CP* average and the *CP* asymmetry of the forward-backward asymmetry in the dimuon system, 3.9 ± 4.0 ± 0.6% and 3.1 ± 4.0 ± 0.4%, respectively.

$\Delta A_{CP} = A_{CP}(\Lambda_c^+ \to pK^+K^-) - A_{CP}(\Lambda_c^+ \to p\pi^+\pi^-)$

VALUE (%)	DOCUMENT ID		TECN	COMMENT
0.30±0.91±0.61	[1] AAIJ	18R	LHCB	pp 7, 8 TeV

[1] AAIJ 18R applies phase-space-dependent weights to the $\Lambda_c^+ \to p\pi^+\pi^-$ sample to align its kinematics with the $\Lambda_c^+ \to pK^+K^-$ sample.

Λ_c^+ REFERENCES

We have omitted some papers that have been superseded by later experiments. The omitted papers may be found in our 1992 edition (Physical Review **D45**, 1 June, Part II) or in earlier editions.

AAIJ	25N	PR D111 L091102	R. Aaij *et al.*	(LHCb Collab.)
ABLIKIM	25AN	PRL 134 021901	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	25AR	PR D111 012014	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	25AS	PR D111 L051101	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	25BH	JHEP 2506 194	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	25BL	CP C49 073001	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	25BN	PR D112 032006	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	25CO	JHEP 2511 067	M. Ablikim *et al.*	(BESIII Collab.)
ADACHI	25L	PR D112 012013	I. Adachi *et al.*	(BELLE and BELLEII Collab.)
AAIJ	24AH	PRL 133 261804	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	24AI	PR D110 052007	R. Aaij *et al.*	(LHCb Collab.)
ABLIKIM	24AP	PRL 132 031801	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	24AU	PR D109 032003	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	24AW	PR D109 052001	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	24AX	PR D109 053005	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	24AY	PR D109 L071103	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	24BA	PR D109 072010	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	24BB	PR D109 L091101	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	24CQ	JHEP 2409 007	M. Ablikim *et al.*	(BESIII Collab.)

AAIJ	23AJ	JHEP 2307 228	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	23Z	PR D108 012023	R. Aaij *et al.*	(LHCb Collab.)
ABLIKIM	23A	CP C47 023001	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	23AB	PL B843 137993	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	23AK	PR D107 052005	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	23AS	PR D108 L031101	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	23AT	PR D108 L031105	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	23BY	JHEP 2309 125	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	23CB	JHEP 2311 137	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	23Z	PR D107 052002	M. Ablikim *et al.*	(BESIII Collab.)
ABUDINEN	23A	PRL 130 071802	F. Abudinen *et al.*	(BELLE II Collab.)
LI	23	PR D107 032001	Y. Li *et al.*	(BELLE Collab.)
LI	23A	PR D107 032003	S.X. Li *et al.*	(BELLE Collab.)
LI	23B	PR D107 032004	L.K. Li *et al.*	(BELLE Collab.)
LI	23C	SCIB 68 583	L.K. Li *et al.*	(BELLE Collab.)
ABLIKIM	22AG	PRL 129 131801	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	22AK	PR D106 052003	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	22AN	PR D106 072002	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	22AR	PR D106 072008	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	22AT	PRL 129 231803	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	22BA	JHEP 2212 033	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	22BB	PR D106 112010	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	22BC	PR D106 L111101	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	22S	PRL 128 142001	M. Ablikim *et al.*	(BESIII Collab.)
LI	22B	JHEP 2203 090	S.X. Li *et al.*	(BELLE Collab.)
PDG	22	PTEP 2022 083C01	R.L. Workman *et al.*	(PDG Collab.)
ABLIKIM	21H	PL B817 136327	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	21N	PR D103 L091101	M. Ablikim *et al.*	(BESIII Collab.) J
LEE	21A	PR D103 052005	J.Y. Lee *et al.*	(BELLE Collab.)
LI	21	PR D103 072004	S.X. Li *et al.*	(BELLE Collab.)
LI	21E	PR D104 072008	S.X. Li *et al.*	(BELLE Collab.)
ABLIKIM	20AJ	EPJ C80 935	M. Ablikim *et al.*	(BESIII Collab.)
AAIJ	19AG	PR D100 032001	R. Aaij *et al.*	(LHCb Collab.)
ABLIKIM	19AX	PR D100 072004	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	19X	CP C43 083002	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	19Y	PR D99 032010	M. Ablikim *et al.*	(BESIII Collab.)
AAIJ	18N	PR D97 091101	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	18R	JHEP 1803 182	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	18V	JHEP 1803 043	R. Aaij *et al.*	(LHCb Collab.)
ABLIKIM	18AF	PRL 121 251801	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	18E	PRL 121 062003	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	18Y	PL B783 200	M. Ablikim *et al.*	(BESIII Collab.)
BERGER	18	PR D98 112006	M. Berger *et al.*	(BELLE Collab.)
ABLIKIM	17D	PL B767 42	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	17H	PRL 118 112001	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	17Q	PR D95 111102	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	17Y	PL B772 388	M. Ablikim *et al.*	(BESIII Collab.)
PAL	17	PR D96 051102	B. Pal *et al.*	(BELLE Collab.)
ABLIKIM	16	PRL 116 052001	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	16U	PRL 117 232002	M. Ablikim *et al.*	(BESIII Collab.)
YANG	16	PRL 117 011801	S.B. Yang *et al.*	(BELLE Collab.)
ABLIKIM	15Y	PRL 115 221805	M. Ablikim *et al.*	(BESIII Collab.)
ZUPANC	14	PRL 113 042002	A. Zupanc *et al.*	(BELLE Collab.)
LEES	11G	PR D84 072006	J.P. Lees *et al.*	(BABAR Collab.)
VAZQUEZ-JA...	08	PL B666 299	E. Vazquez-Jauregui *et al.*	(SELEX Collab.)
AUBERT	07U	PR D75 052002	B. Aubert *et al.*	(BABAR Collab.)
LINK	06A	PL B634 165	J.M. Link *et al.*	(FNAL FOCUS Collab.)
AUBERT,B	05S	PR D72 052006	B. Aubert *et al.*	(BABAR Collab.)
HINSON	05	PRL 94 191801	J.W. Hinson *et al.*	(CLEO Collab.)
LINK	05F	PL B624 22	J.M. Link *et al.*	(FNAL FOCUS Collab.)
CRONIN-HEN...	03	PR D67 012001	D. Cronin-Hennessy *et al.*	(CLEO Collab.)
KAYIS-TOPAK...	03	PL B555 156	A. Kayis-Topaksu *et al.*	(CERN CHORUS Collab.)
ABE	02C	PL B524 33	K. Abe *et al.*	(KEK BELLE Collab.)
LINK	02C	PRL 88 161801	J.M. Link *et al.*	(FNAL FOCUS Collab.)
LINK	02G	PL B540 25	J.M. Link *et al.*	(FNAL FOCUS Collab.)
PDG	02	PR D66 010001	K. Hagiwara *et al.*	(PDG Collab.)
KUSHNIR...	01	PRL 86 5243	A. Kushnirenko *et al.*	(FNAL SELEX Collab.)
MAHMOOD	01	PRL 86 2232	A.H. Mahmood *et al.*	(CLEO Collab.)
AITALA	00	PL B471 449	E.M. Aitala *et al.*	(FNAL E791 Collab.)
ALAM	98	PR D57 4467	M.S. Alam *et al.*	(CLEO Collab.)
ALBRECHT	96E	PRPL 276 223	H. Albrecht *et al.*	(ARGUS Collab.)

ALEXANDER	96C	PR D53 1013	J.P. Alexander *et al.*	(CLEO Collab.)
ALBRECHT	95B	PL B342 397	H. Albrecht *et al.*	(ARGUS Collab.)
AMMAR	95	PRL 74 3534	R. Ammar *et al.*	(CLEO Collab.)
BISHAI	95	PL B350 256	M. Bishai *et al.*	(CLEO Collab.)
CRAWFORD	95	PRL 75 624	G. Crawford *et al.*	(CLEO Collab.)
KODAMA	95	PL B345 85	K. Kodama *et al.*	(FNAL E653 Collab.)
ALBRECHT	94B	PL B326 320	H. Albrecht *et al.*	(ARGUS Collab.)
ALEEV	94	PAN 57 1370	A.N. Aleev *et al.*	(Serpukhov BIS-2 Collab.)
		Translated from YF 57 1443.		
AVERY	94	PL B325 257	P. Avery *et al.*	(CLEO Collab.)
BERGFELD	94	PL B323 219	T. Bergfeld *et al.*	(CLEO Collab.)
FRABETTI	94E	PL B328 193	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
AVERY	93	PRL 71 2391	P. Avery *et al.*	(CLEO Collab.)
BOZEK	93	PL B312 247	A. Bozek *et al.*	(CERN NA32 Collab.)
FRABETTI	93D	PRL 70 1755	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
FRABETTI	93H	PL B314 477	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
KUBOTA	93	PRL 71 3255	Y. Kubota *et al.*	(CLEO Collab.)
ALBRECHT	92	PL B274 239	H. Albrecht *et al.*	(ARGUS Collab.)
BARLAG	92	PL B283 465	S. Barlag *et al.*	(ACCMOR Collab.)
CRAWFORD	92	PR D45 752	G. Crawford *et al.*	(CLEO Collab.)
JEZABEK	92	PL B286 175	M. Jezabek, K. Rybicki, R. Rylko	(CRAC)
ALBRECHT	91G	PL B269 234	H. Albrecht *et al.*	(ARGUS Collab.)
AVERY	91	PR D43 3599	P. Avery *et al.*	(CLEO Collab.)
ALVAREZ	90	ZPHY C47 539	M.P. Alvarez *et al.*	(CERN NA14/2 Collab.)
ALVAREZ	90B	PL B246 256	M.P. Alvarez *et al.*	(CERN NA14/2 Collab.)
ANJOS	90	PR D41 801	J.C. Anjos *et al.*	(FNAL E691 Collab.)
AVERY	90B	PRL 65 2842	P. Avery *et al.*	(CLEO Collab.)
BARLAG	90D	ZPHY C48 29	S. Barlag *et al.*	(ACCMOR Collab.)
FRABETTI	90	PL B251 639	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
BARLAG	89	PL B218 374	S. Barlag *et al.*	(ACCMOR Collab.)
AGUILAR-...	88B	ZPHY C40 321	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
Also		PL B189 254	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
Also		PL B199 462	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
Also		SJNP 48 833	M. Begalli *et al.*	(LEBC-EHS Collab.)
		Translated from YAF 48 1310.		
ALBRECHT	88C	PL B207 109	H. Albrecht *et al.*	(ARGUS Collab.)
ANJOS	88B	PRL 60 1379	J.C. Anjos *et al.*	(FNAL E691 Collab.)
AMENDOLIA	87	ZPHY C36 513	S.R. Amendolia *et al.*	(CERN NA1 Collab.)
JONES	87	ZPHY C36 593	G.T. Jones *et al.*	(CERN WA21 Collab.)
BOSETTI	82	PL 109B 234	P.C. Bosetti *et al.*	(AACH3, BONN, CERN+)
BASILE	81B	NC 62A 14	M. Basile *et al.*	(CERN, BGNA, PGIA, FRAS)
CALICCHIO	80	PL 93B 521	M. Calicchio *et al.*	(BARI, BIRM, BRUX+)

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