$D^{\pm}$

$I(J^P) = \frac{1}{2}(0^-)$

$D^{\pm}$ MASS

The fit includes $D^{\pm}$, D^0, $D_s^{\pm}$, $D^{*\pm}$, D^{*0}, and $D_s^{*\pm}$ mass and mass difference measurements.

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1869.3± 0.5 OUR FIT	Error includes scale factor of 1.1.				
1869.4± 0.5 OUR AVERAGE					
1870.0± 0.5±1.0	317	BARLAG	90C	ACCM	π^- Cu 230 GeV
1863 ± 4		DERRICK	84	HRS	e^+e^- 29 GeV
1869.4± 0.6		[1] TRILLING	81	RVUE	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1875 ±10	9	ADAMOVICH	87	EMUL	Photoproduction
1860 ±16	6	ADAMOVICH	84	EMUL	Photoproduction
1868.4± 0.5		[1] SCHINDLER	81	MRK2	e^+e^- 3.77 GeV
1874 ± 5		GOLDHABER	77	MRK1	D^0, D^+ recoil spectra
1868.3± 0.9		[1] PERUZZI	77	MRK1	e^+e^- 3.77 GeV
1874 ±11		PICCOLO	77	MRK1	e^+e^- 4.03, 4.41 GeV
1876 ±15	50	PERUZZI	76	MRK1	$K^{\mp}\pi^{\pm}\pi^{\pm}$

[1] PERUZZI 77 and SCHINDLER 81 errors do not include the 0.13% uncertainty in the absolute SPEAR energy calibration. TRILLING 81 uses the high precision $J/\psi(1S)$ and $\psi(2S)$ measurements of ZHOLENTZ 80 to determine this uncertainty and combines the PERUZZI 77 and SCHINDLER 81 results to obtain the value quoted.

$D^{\pm}$ MEAN LIFE

Measurements with an error $> 0.1\times10^{-12}$ s are omitted from the average, and those with an error $> 0.2 \times 10^{-12}$ s have been omitted from the Listings.

VALUE (10^{-12} s)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1.057±0.015 OUR AVERAGE					
1.048±0.015±0.011	9k	FRABETTI	94D	E687	$D^+ \rightarrow K^-\pi^+\pi^+$
1.075±0.040±0.018	2455	FRABETTI	91	E687	γ Be, $D^+ \rightarrow K^-\pi^+\pi^+$
1.03 ±0.08 ±0.06	200	ALVAREZ	90	NA14	γ, $D^+ \rightarrow K^-\pi^+\pi^+$
1.05 $^{+0.077}_{-0.072}$	317	[2] BARLAG	90C	ACCM	π^- Cu 230 GeV
1.05 ±0.08 ±0.07	363	ALBRECHT	88I	ARG	e^+e^- 10 GeV
1.090±0.030±0.025	2992	RAAB	88	E691	Photoproduction

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

1.12 $^{+0.14}_{-0.11}$		149	AGUILAR-...	87D	HYBR	$\pi^- p$ and pp
1.09 $^{+0.19}_{-0.15}$		59	BARLAG	87B	ACCM	K^- and π^- 200 GeV
1.14 ±0.16	±0.07	247	CSORNA	87	CLEO	e^+e^- 10 GeV
1.09 ±0.14		74	[3] PALKA	87B	SILI	π Be 200 GeV
0.86 ±0.13	$^{+0.07}_{-0.03}$	48	ABE	86	HYBR	γp 20 GeV

[2] BARLAG 90C estimates the systematic error to be negligible.
[3] PALKA 87B observes this in $D^+ \to \overline{K}^*(892)\, e\nu$.

D^+ DECAY MODES

D^- modes are charge conjugates of the modes below.

	Mode		Fraction (Γ_i/Γ)	Scale factor/ Confidence level
	Inclusive modes			
Γ_1	e^+ anything		(17.2 ±1.9) %	
Γ_2	K^- anything		(24.2 ±2.8) %	S=1.4
Γ_3	$\overline{K}^0$ anything + K^0 anything		(59 ±7) %	
Γ_4	K^+ anything		(5.8 ±1.4) %	
Γ_5	η anything	[a]	< 13 %	CL=90%
Γ_6	μ^+ anything			
	Leptonic and semileptonic modes			
Γ_7	$\mu^+\nu_\mu$		< 7.2 $\times 10^{-4}$	CL=90%
Γ_8	$\overline{K}^0 \ell^+ \nu_\ell$	[b]	(6.8 ±0.8) %	
Γ_9	$\overline{K}^0 e^+ \nu_e$		(6.7 ±0.9) %	
Γ_{10}	$\overline{K}^0 \mu^+ \nu_\mu$		(7.0 $^{+3.0}_{-2.0}$) %	
Γ_{11}	$K^-\pi^+ e^+ \nu_e$		(4.1 $^{+0.9}_{-0.7}$) %	
Γ_{12}	$\overline{K}^*(892)^0 e^+ \nu_e$ $\times$ B$(\overline{K}^{*0} \to K^-\pi^+)$		(3.2 ±0.33) %	
Γ_{13}	$K^-\pi^+ e^+ \nu_e$ nonresonant		< 7 $\times 10^{-3}$	CL=90%
Γ_{14}	$K^-\pi^+\mu^+\nu_\mu$		(3.2 ±0.4) %	S=1.1
	In the fit as $\frac{2}{3}\Gamma_{26} + \Gamma_{16}$, where $\frac{2}{3}\Gamma_{26} = \Gamma_{15}$.			
Γ_{15}	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$ $\times$ B$(\overline{K}^{*0} \to K^-\pi^+)$		(2.9 ±0.4) %	

Γ_{16}	$K^- \pi^+ \mu^+ \nu_\mu$ nonresonant		(2.7 ±1.1) × 10^{-3}	
Γ_{17}	$\overline{K}^0 \pi^+ \pi^- e^+ \nu_e$			
Γ_{18}	$K^- \pi^+ \pi^0 e^+ \nu_e$			
Γ_{19}	$(\overline{K}^*(892) \pi)^0 e^+ \nu_e$		< 1.2 %	CL=90%
Γ_{20}	$(\overline{K} \pi \pi)^0 e^+ \nu_e$ non-$\overline{K}^*(892)$		< 9 × 10^{-3}	CL=90%
Γ_{21}	$K^- \pi^+ \pi^0 \mu^+ \nu_\mu$		< 1.4 × 10^{-3}	CL=90%
Γ_{22}	$\pi^0 \ell^+ \nu_\ell$	[c]	(3.1 ±1.5) × 10^{-3}	
Γ_{23}	$\pi^+ \pi^- e^+ \nu_e$			

Fractions of some of the following modes with resonances have already appeared above as submodes of particular charged-particle modes.

Γ_{24}	$\overline{K}^*(892)^0 \ell^+ \nu_\ell$	[b]	(4.7 ±0.4) %	
Γ_{25}	$\overline{K}^*(892)^0 e^+ \nu_e$		(4.8 ±0.5) %	
Γ_{26}	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$		(4.4 ±0.6) %	S=1.1
Γ_{27}	$\rho^0 e^+ \nu_e$		(2.2 ±0.8) × 10^{-3}	
Γ_{28}	$\rho^0 \mu^+ \nu_\mu$		(2.7 ±0.7) × 10^{-3}	
Γ_{29}	$\phi e^+ \nu_e$		< 2.09 %	CL=90%
Γ_{30}	$\phi \mu^+ \nu_\mu$		< 3.72 %	CL=90%
Γ_{31}	$\eta \ell^+ \nu_\ell$		< 5 × 10^{-3}	CL=90%
Γ_{32}	$\eta'(958) \mu^+ \nu_\mu$		< 9 × 10^{-3}	CL=90%

Hadronic modes with a $\overline{K}$ or $\overline{K} K \overline{K}$

Γ_{33}	$\overline{K}^0 \pi^+$		(2.89±0.26) %	S=1.1
Γ_{34}	$K^- \pi^+ \pi^+$	[d]	(9.0 ±0.6) %	
Γ_{35}	$\overline{K}^*(892)^0 \pi^+$ × B($\overline{K}^{*0} \rightarrow K^- \pi^+$)		(1.27±0.13) %	
Γ_{36}	$\overline{K}_0^*(1430)^0 \pi^+$ × B($\overline{K}_0^*(1430)^0 \rightarrow K^- \pi^+$)		(2.3 ±0.3) %	
Γ_{37}	$\overline{K}^*(1680)^0 \pi^+$ × B($\overline{K}^*(1680)^0 \rightarrow K^- \pi^+$)		(3.7 ±0.8) × 10^{-3}	
Γ_{38}	$K^- \pi^+ \pi^+$ nonresonant		(8.5 ±0.8) %	
Γ_{39}	$\overline{K}^0 \pi^+ \pi^0$	[d]	(9.7 ±3.0) %	S=1.1
Γ_{40}	$\overline{K}^0 \rho^+$		(6.6 ±2.5) %	
Γ_{41}	$\overline{K}^*(892)^0 \pi^+$ × B($\overline{K}^{*0} \rightarrow \overline{K}^0 \pi^0$)		(6.3 ±0.4) × 10^{-3}	
Γ_{42}	$\overline{K}^0 \pi^+ \pi^0$ nonresonant		(1.3 ±1.1) %	
Γ_{43}	$K^- \pi^+ \pi^+ \pi^0$	[d]	(6.4 ±1.1) %	
Γ_{44}	$\overline{K}^*(892)^0 \rho^+$ total × B($\overline{K}^{*0} \rightarrow K^- \pi^+$)		(1.4 ±0.9) %	
Γ_{45}	$\overline{K}_1(1400)^0 \pi^+$ × B($\overline{K}_1(1400)^0 \rightarrow K^- \pi^+ \pi^0$)		(2.2 ±0.6) %	
Γ_{46}	$K^- \rho^+ \pi^+$ total		(3.1 ±1.1) %	
Γ_{47}	$K^- \rho^+ \pi^+$ 3-body		(1.1 ±0.4) %	

Γ_{48}	$\overline{K}^*(892)^0\pi^+\pi^0$ total $\times$ B($\overline{K}^{*0} \to K^-\pi^+$)		(4.5 ±0.9) %	
Γ_{49}	$\overline{K}^*(892)^0\pi^+\pi^0$ 3-body $\times$ B($\overline{K}^{*0} \to K^-\pi^+$)		(2.8 ±0.9) %	
Γ_{50}	$K^*(892)^-\pi^+\pi^+$ 3-body $\times$ B($K^{*-} \to K^-\pi^0$)		(7 ±3) $\times 10^{-3}$	
Γ_{51}	$K^-\pi^+\pi^+\pi^0$ nonresonant	[e]	(1.2 ±0.6) %	
Γ_{52}	$\overline{K}^0\pi^+\pi^+\pi^-$	[d]	(7.0 ±0.9) %	
Γ_{53}	$\overline{K}^0 a_1(1260)^+$ $\times$ B($a_1(1260)^+ \to \pi^+\pi^+\pi^-$)		(4.0 ±0.9) %	
Γ_{54}	$\overline{K}_1(1400)^0\pi^+$ $\times$ B($\overline{K}_1(1400)^0 \to \overline{K}^0\pi^+\pi^-$)		(2.2 ±0.6) %	
Γ_{55}	$K^*(892)^-\pi^+\pi^+$ 3-body $\times$ B($K^{*-} \to \overline{K}^0\pi^-$)		(1.4 ±0.6) %	
Γ_{56}	$\overline{K}^0\rho^0\pi^+$ total		(4.2 ±0.9) %	
Γ_{57}	$\overline{K}^0\rho^0\pi^+$ 3-body		(5 ±5) $\times 10^{-3}$	
Γ_{58}	$\overline{K}^0\pi^+\pi^+\pi^-$ nonresonant		(8 ±4) $\times 10^{-3}$	
Γ_{59}	$K^-\pi^+\pi^+\pi^+\pi^-$	[d]	(7.2 ±1.0) $\times 10^{-3}$	
Γ_{60}	$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$ $\times$ B($\overline{K}^{*0} \to K^-\pi^+$)		(5.4 ±2.3) $\times 10^{-3}$	
Γ_{61}	$\overline{K}^*(892)^0\rho^0\pi^+$ $\times$ B($\overline{K}^{*0} \to K^-\pi^+$)		(1.9 $^{+1.1}_{-1.0}$) $\times 10^{-3}$	
Γ_{62}	$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$ no-ρ $\times$ B($\overline{K}^{*0} \to K^-\pi^+$)		(2.9 ±1.1) $\times 10^{-3}$	
Γ_{63}	$K^-\rho^0\pi^+\pi^+$		(3.1 ±0.9) $\times 10^{-3}$	
Γ_{64}	$K^-\pi^+\pi^+\pi^+\pi^-$ nonresonant		< 2.3 $\times 10^{-3}$	CL=90%
Γ_{65}	$K^-\pi^+\pi^+\pi^0\pi^0$		(2.2 $^{+5.0}_{-0.9}$) %	
Γ_{66}	$\overline{K}^0\pi^+\pi^+\pi^-\pi^0$		(5.4 $^{+3.0}_{-1.4}$) %	
Γ_{67}	$\overline{K}^0\pi^+\pi^+\pi^+\pi^-\pi^-$		(8 ±7) $\times 10^{-4}$	
Γ_{68}	$K^-\pi^+\pi^+\pi^+\pi^-\pi^0$		(2.0 ±1.8) $\times 10^{-3}$	
Γ_{69}	$\overline{K}^0\overline{K}^0K^+$		(1.8 ±0.8) %	

Fractions of some of the following modes with resonances have already appeared above as submodes of particular charged-particle modes.

Γ_{70}	$\overline{K}^0\rho^+$		(6.6 ±2.5) %	
Γ_{71}	$\overline{K}^0 a_1(1260)^+$		(8.0 ±1.7) %	
Γ_{72}	$\overline{K}^0 a_2(1320)^+$		< 3 $\times 10^{-3}$	CL=90%
Γ_{73}	$\overline{K}^*(892)^0\pi^+$		(1.90±0.19) %	
Γ_{74}	$\overline{K}^*(892)^0\rho^+$ total	[e]	(2.1 ±1.3) %	
Γ_{75}	$\overline{K}^*(892)^0\rho^+$ *S*-wave	[e]	(1.6 ±1.6) %	
Γ_{76}	$\overline{K}^*(892)^0\rho^+$ *P*-wave		< 1 $\times 10^{-3}$	CL=90%
Γ_{77}	$\overline{K}^*(892)^0\rho^+$ *D*-wave		(10 ±7) $\times 10^{-3}$	

Γ_{78}	$\overline{K}^*(892)^0 \rho^+$ D-wave longitudinal		$<$ 7	$\times 10^{-3}$	CL=90%
Γ_{79}	$\overline{K}_1(1270)^0 \pi^+$		$<$ 7	$\times 10^{-3}$	CL=90%
Γ_{80}	$\overline{K}_1(1400)^0 \pi^+$		(4.9 $\pm$1.2) %		
Γ_{81}	$\overline{K}^*(1410)^0 \pi^+$		$<$ 7	$\times 10^{-3}$	CL=90%
Γ_{82}	$\overline{K}_0^*(1430)^0 \pi^+$		(3.7 $\pm$0.4) %		
Γ_{83}	$\overline{K}^*(1680)^0 \pi^+$		(1.43$\pm$0.30) %		
Γ_{84}	$\overline{K}^*(892)^0 \pi^+ \pi^0$ total		(6.7 $\pm$1.4) %		
Γ_{85}	$\overline{K}^*(892)^0 \pi^+ \pi^0$ 3-body	[*e*]	(4.2 $\pm$1.4) %		
Γ_{86}	$K^*(892)^- \pi^+ \pi^+$ total				
Γ_{87}	$K^*(892)^- \pi^+ \pi^+$ 3-body		(2.0 $\pm$0.9) %		
Γ_{88}	$K^- \rho^+ \pi^+$ total		(3.1 $\pm$1.1) %		
Γ_{89}	$K^- \rho^+ \pi^+$ 3-body		(1.1 $\pm$0.4) %		
Γ_{90}	$\overline{K}^0 \rho^0 \pi^+$ total		(4.2 $\pm$0.9) %		CL=90%
Γ_{91}	$\overline{K}^0 \rho^0 \pi^+$ 3-body		(5 $\pm$5)	$\times 10^{-3}$	
Γ_{92}	$\overline{K}^0 f_0(980) \pi^+$		$<$ 5	$\times 10^{-3}$	CL=90%
Γ_{93}	$\overline{K}^*(892)^0 \pi^+ \pi^+ \pi^-$		(8.1 $\pm$3.4)	$\times 10^{-3}$	S=1.7
Γ_{94}	$\overline{K}^*(892)^0 \rho^0 \pi^+$		(2.9 $^{+1.7}_{-1.5}$)	$\times 10^{-3}$	S=1.8
Γ_{95}	$\overline{K}^*(892)^0 \pi^+ \pi^+ \pi^-$ no-ρ		(4.3 $\pm$1.7)	$\times 10^{-3}$	
Γ_{96}	$K^- \rho^0 \pi^+ \pi^+$		(3.1 $\pm$0.9)	$\times 10^{-3}$	

Pionic modes

Γ_{97}	$\pi^+ \pi^0$		(2.5 $\pm$0.7)	$\times 10^{-3}$	
Γ_{98}	$\pi^+ \pi^+ \pi^-$		(3.6 $\pm$0.4)	$\times 10^{-3}$	
Γ_{99}	$\rho^0 \pi^+$		(1.05$\pm$0.31)	$\times 10^{-3}$	
Γ_{100}	$\pi^+ \pi^+ \pi^-$ nonresonant		(2.2 $\pm$0.4)	$\times 10^{-3}$	
Γ_{101}	$\pi^+ \pi^+ \pi^- \pi^0$		(1.9 $^{+1.5}_{-1.2}$) %		
Γ_{102}	$\eta \pi^+ \times$ B($\eta \rightarrow \pi^+ \pi^- \pi^0$)		(1.7 $\pm$0.6)	$\times 10^{-3}$	
Γ_{103}	$\omega \pi^+ \times$ B($\omega \rightarrow \pi^+ \pi^- \pi^0$)		$<$ 6	$\times 10^{-3}$	CL=90%
Γ_{104}	$\pi^+ \pi^+ \pi^+ \pi^- \pi^-$		(2.1 $\pm$0.4)	$\times 10^{-3}$	
Γ_{105}	$\pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^0$		(2.9 $^{+2.9}_{-2.0}$)	$\times 10^{-3}$	

Fractions of some of the following modes with resonances have already appeared above as submodes of particular charged-particle modes.

Γ_{106}	$\eta \pi^+$		(7.5 $\pm$2.5)	$\times 10^{-3}$	
Γ_{107}	$\rho^0 \pi^+$		(1.05$\pm$0.31)	$\times 10^{-3}$	
Γ_{108}	$\omega \pi^+$		$<$ 7	$\times 10^{-3}$	CL=90%
Γ_{109}	$\eta \rho^+$		$<$ 1.2	%	CL=90%
Γ_{110}	$\eta'(958) \pi^+$		$<$ 9	$\times 10^{-3}$	CL=90%
Γ_{111}	$\eta'(958) \rho^+$		$<$ 1.5	%	CL=90%

Hadronic modes with a $K\overline{K}$ pair

Γ_{112}	$K^+\overline{K}^0$		$(7.4\ \pm1.0)\times10^{-3}$	
Γ_{113}	$K^+K^-\pi^+$	[d]	$(8.8\ \pm0.8)\times10^{-3}$	
Γ_{114}	$\phi\pi^+\times$ B$(\phi\to K^+K^-)$		$(3.0\ \pm0.3)\times10^{-3}$	
Γ_{115}	$K^+\overline{K}^*(892)^0\times$ B$(\overline{K}^{*0}\to K^-\pi^+)$		$(2.8\ \pm0.4)\times10^{-3}$	
Γ_{116}	$K^+K^-\pi^+$ nonresonant		$(4.5\ \pm0.9)\times10^{-3}$	
Γ_{117}	$K^0\overline{K}^0\pi^+$		—	
Γ_{118}	$K^*(892)^+\overline{K}^0\times$ B$(K^{*+}\to K^0\pi^+)$		$(2.1\ \pm1.0)$ %	
Γ_{119}	$K^+K^-\pi^+\pi^0$		—	
Γ_{120}	$\phi\pi^+\pi^0\times$ B$(\phi\to K^+K^-)$		$(1.1\ \pm0.5)$ %	
Γ_{121}	$\phi\rho^+\times$ B$(\phi\to K^+K^-)$		$<7\times10^{-3}$	CL=90%
Γ_{122}	$K^+K^-\pi^+\pi^0$non-ϕ		$(1.5\ ^{+0.7}_{-0.6})$ %	
Γ_{123}	$K^+\overline{K}^0\pi^+\pi^-$		<2 %	CL=90%
Γ_{124}	$K^0K^-\pi^+\pi^+$		$(1.0\ \pm0.6)$ %	
Γ_{125}	$K^*(892)^+\overline{K}^*(892)^0\times$ B$^2(K^{*+}\to K^0\pi^+)$		$(1.2\ \pm0.5)$ %	
Γ_{126}	$K^0K^-\pi^+\pi^+$non-$K^{*+}\overline{K}^{*0}$		$<7.9\times10^{-3}$	CL=90%
Γ_{127}	$K^+K^-\pi^+\pi^+\pi^-$		—	
Γ_{128}	$\phi\pi^+\pi^+\pi^-\times$ B$(\phi\to K^+K^-)$		$<1\times10^{-3}$	CL=90%
Γ_{129}	$K^+K^-\pi^+\pi^+\pi^-$ nonresonant		<3 %	CL=90%

Fractions of the following modes with resonances have already appeared above as submodes of particular charged-particle modes.

Γ_{130}	$\phi\pi^+$		$(6.1\ \pm0.6)\times10^{-3}$	
Γ_{131}	$\phi\pi^+\pi^0$		$(2.3\ \pm1.0)$ %	
Γ_{132}	$\phi\rho^+$		<1.4 %	CL=90%
Γ_{133}	$\phi\pi^+\pi^+\pi^-$		$<2\times10^{-3}$	CL=90%
Γ_{134}	$K^+\overline{K}^*(892)^0$		$(4.2\ \pm0.5)\times10^{-3}$	
Γ_{135}	$K^*(892)^+\overline{K}^0$		$(3.2\ \pm1.5)$ %	
Γ_{136}	$K^*(892)^+\overline{K}^*(892)^0$		$(2.6\ \pm1.1)$ %	

Doubly Cabibbo suppressed (*DC*) modes, $\Delta C=1$ weak neutral current (*C1*) modes, or Lepton Family number (*LF*) or Lepton number (*L*) violating modes

Γ_{137}	$K^+\pi^+\pi^-$	*DC*	$(6.8\ \pm1.5)\times10^{-4}$	
Γ_{138}	$K^+\rho^0$	*DC*	$(2.5\ \pm1.2)\times10^{-4}$	
Γ_{139}	$K^*(892)^0\pi^+$	*DC*	$(3.6\ \pm1.6)\times10^{-4}$	
Γ_{140}	$K^+\pi^+\pi^-$ nonresonant	*DC*	$(2.4\ \pm1.2)\times10^{-4}$	
Γ_{141}	$K^+K^+K^-$	*DC*	$<1.4\times10^{-4}$	CL=90%
Γ_{142}	ϕK^+	*DC*	$<1.3\times10^{-4}$	CL=90%
Γ_{143}	$\pi^+e^+e^-$	*C1*	$<6.6\times10^{-5}$	CL=90%

Γ_{144}	$\pi^+\mu^+\mu^-$	*C1*	$<$	1.8	$\times 10^{-5}$	CL=90%
Γ_{145}	$\rho^+\mu^+\mu^-$	*C1*	$<$	5.6	$\times 10^{-4}$	CL=90%
Γ_{146}	$K^+e^+e^-$		[*f*] $<$	2.0	$\times 10^{-4}$	CL=90%
Γ_{147}	$K^+\mu^+\mu^-$		[*f*] $<$	9.7	$\times 10^{-5}$	CL=90%
Γ_{148}	$\pi^+e^+\mu^-$	*LF*	$<$	1.1	$\times 10^{-4}$	CL=90%
Γ_{149}	$\pi^+e^-\mu^+$	*LF*	$<$	1.3	$\times 10^{-4}$	CL=90%
Γ_{150}	$K^+e^+\mu^-$	*LF*	$<$	1.3	$\times 10^{-4}$	CL=90%
Γ_{151}	$K^+e^-\mu^+$	*LF*	$<$	1.2	$\times 10^{-4}$	CL=90%
Γ_{152}	$\pi^-e^+e^+$	*L*	$<$	1.1	$\times 10^{-4}$	CL=90%
Γ_{153}	$\pi^-\mu^+\mu^+$	*L*	$<$	8.7	$\times 10^{-5}$	CL=90%
Γ_{154}	$\pi^-e^+\mu^+$	*L*	$<$	1.1	$\times 10^{-4}$	CL=90%
Γ_{155}	$\rho^-\mu^+\mu^+$	*L*	$<$	5.6	$\times 10^{-4}$	CL=90%
Γ_{156}	$K^-e^+e^+$	*L*	$<$	1.2	$\times 10^{-4}$	CL=90%
Γ_{157}	$K^-\mu^+\mu^+$	*L*	$<$	1.2	$\times 10^{-4}$	CL=90%
Γ_{158}	$K^-e^+\mu^+$	*L*	$<$	1.3	$\times 10^{-4}$	CL=90%
Γ_{159}	$K^*(892)^-\mu^+\mu^+$	*L*	$<$	8.5	$\times 10^{-4}$	CL=90%

Γ_{160}	A dummy mode used by the fit.	(33 ± 5) %

[*a*] This is a weighted average of $D^\pm$ (44%) and D^0 (56%) branching fractions. See "D^+ and $D^0 \rightarrow$ (η anything) / (total D^+ and D^0)" under "D^+ Branching Ratios" in these Particle Listings.

[*b*] This value averages the e^+ and μ^+ branching fractions, after making a small phase-space adjustment to the μ^+ fraction to be able to use it as an e^+ fraction; hence our ℓ^+ here is really an e^+.

[*c*] An ℓ indicates an e or a μ mode, not a sum over these modes.

[*d*] The branching fraction for this mode may differ from the sum of the submodes that contribute to it, due to interference effects. See the relevant papers.

[*e*] The two experiments measuring this fraction are in serious disagreement. See the Particle Listings.

[*f*] This mode is not a useful test for a ΔC=1 weak neutral current because both quarks must change flavor in this decay.

CONSTRAINED FIT INFORMATION

An overall fit to 32 branching ratios uses 54 measurements and one constraint to determine 20 parameters. The overall fit has a $\chi^2 = 20.8$ for 35 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, $x_i \equiv \Gamma_i/\Gamma_{total}$. The fit constrains the x_i whose labels appear in this array to sum to one.

	x_9	x_{11}	x_{16}	x_{25}	x_{26}	x_{33}	x_{34}	x_{39}	x_{43}	x_{52}
x_{11}	5									
x_{16}	4	2								
x_{25}	18	29	8							
x_{26}	14	7	31	25						
x_{33}	38	9	8	31	25					
x_{34}	32	16	14	56	45	55				
x_{39}	0	0	0	0	0	0	0			
x_{43}	7	4	3	13	10	12	23	0		
x_{52}	9	5	4	17	14	16	30	0	18	
x_{59}	15	8	7	28	22	27	49	0	11	15
x_{73}	21	11	9	37	29	36	65	0	15	20
x_{80}	5	3	2	9	7	8	16	0	31	37
x_{87}	3	1	1	5	4	5	9	0	29	13
x_{93}	5	2	2	9	7	8	15	0	3	5
x_{94}	3	2	1	6	5	6	11	0	2	3
x_{98}	19	10	9	35	28	33	61	0	14	18
x_{100}	11	5	5	19	15	18	34	0	8	10
x_{112}	22	7	6	23	18	53	41	0	9	12
x_{160}	−35	−26	−12	−41	−34	−38	−55	−58	−46	−45

	x_{59}	x_{73}	x_{80}	x_{87}	x_{93}	x_{94}	x_{98}	x_{100}	x_{112}
x_{73}	32								
x_{80}	8	10							
x_{87}	4	6	12						
x_{93}	29	10	2	1					
x_{94}	8	7	2	1	15				
x_{98}	30	40	10	5	9	7			
x_{100}	16	22	5	3	5	4	43		
x_{112}	20	26	6	4	6	4	25	14	
x_{160}	−30	−38	−46	−32	−16	−10	−35	−19	−27

D^+ BRANCHING RATIOS

See the "Note on D Mesons" above. Some now-obsolete measurements have been omitted from these Listings.

Inclusive modes

$\Gamma(e^+ \text{anything})/\Gamma_{\text{total}}$ Γ_1/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.172±0.019 OUR AVERAGE					
$0.20\ ^{+0.09}_{-0.07}$		AGUILAR-...	87E	HYBR	πp, $p p$ 360, 400 GeV
0.170±0.019±0.007	158	BALTRUSAIT...	85B	MRK3	$e^+ e^-$ 3.77 GeV
0.168±0.064	23	SCHINDLER	81	MRK2	$e^+ e^-$ 3.771 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.220\ ^{+0.044}_{-0.022}$		BACINO	80	DLCO	$e^+ e^-$ 3.77 GeV

D^+ and $D^0 \rightarrow$ (e^+ anything) / (total D^+ and D^0)

If measured at the $\psi(3770)$, this quantity is a weighted average of D^+ (44%) and D^0 (56%) branching fractions. Only experiments at E_{cm} = 3.77 GeV are included in the average here. We don't put this result in the Meson Summary Table.

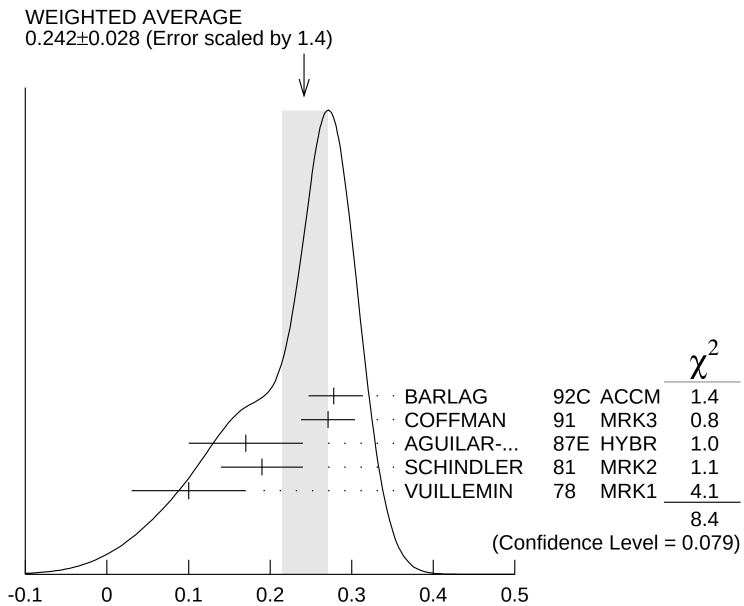
VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.110±0.011 OUR AVERAGE	Error includes scale factor of 1.1.				
0.117±0.011	295	BALTRUSAIT...	85B	MRK3	$e^+ e^-$ 3.77 GeV
0.10 ±0.032		[4] SCHINDLER	81	MRK2	$e^+ e^-$ 3.771 GeV
0.072±0.028		FELLER	78	MRK1	$e^+ e^-$ 3.772 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.096±0.004±0.011	2207	[5] ALBRECHT	96C	ARG	$e^+ e^- \approx$ 10 GeV
0.134±0.015±0.010		[6] ABE	93E	VNS	$e^+ e^-$ 58 GeV
$0.098\pm0.009\ ^{+0.006}_{-0.005}$	240	[7] ALBRECHT	92F	ARG	$e^+ e^- \approx$ 10 GeV
0.096±0.007±0.015		[8] ONG	88	MRK2	$e^+ e^-$ 29 GeV
$0.116\ ^{+0.011}_{-0.009}$		[8] PAL	86	DLCO	$e^+ e^-$ 29 GeV
0.091±0.009±0.013		[8] AIHARA	85	TPC	$e^+ e^-$ 29 GeV
0.092±0.022±0.040		[8] ALTHOFF	84J	TASS	$e^+ e^-$ 34.6 GeV
0.091±0.013		[8] KOOP	84	DLCO	See PAL 86
0.08 ±0.015		[9] BACINO	79	DLCO	$e^+ e^-$ 3.772 GeV

[4] Isolates D^+ and $D^0 \rightarrow e^+ X$ and weights for relative production (44%–56%).
[5] ALBRECHT 96C uses e^- in the hemisphere opposite to $D^{*+} \rightarrow D^0 \pi^+$ events.
[6] ABE 93E also measures forward-backward asymmetries and fragmentation functions for c and b quarks.
[7] ALBRECHT 92F uses the excess of right-sign over wrong-sign leptons in a sample of events tagged by fully reconstructed $D^*(2010)^+ \rightarrow D^0 \pi^+$ decays.
[8] Average BR for charm $\rightarrow e^+ X$. Unlike at E_{cm} = 3.77 GeV, the admixture of charmed mesons is unknown.
[9] Not independent of BACINO 80 measurements of $\Gamma(e^+ \text{anything})/\Gamma_{\text{total}}$ for the D^+ and D^0 separately.

$\Gamma(K^- \text{anything})/\Gamma_{total}$ — Γ_2/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.242±0.028 OUR AVERAGE		Error includes scale factor of 1.4. See the ideogram below.		
$0.278^{+0.036}_{-0.031}$		[10] BARLAG 92C	ACCM	π^- Cu 230 GeV
0.271±0.023±0.024		COFFMAN 91	MRK3	e^+e^- 3.77 GeV
0.17 ±0.07		AGUILAR-... 87E	HYBR	πp, pp 360, 400 GeV
0.19 ±0.05	26	SCHINDLER 81	MRK2	e^+e^- 3.771 GeV
0.10 ±0.07	3	VUILLEMIN 78	MRK1	e^+e^- 3.772 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.16\ ^{+0.08}_{-0.07}$		AGUILAR-... 86B	HYBR	See AGUILAR-BENITEZ 87E

[10] BARLAG 92C computes the branching fraction using topological normalization.



$\Gamma(K^- \text{anything})/\Gamma_{total}$

$[\Gamma(\overline{K}^0 \text{anything}) + \Gamma(K^0 \text{anything})]/\Gamma_{total}$ — Γ_3/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.59 ±0.07 OUR AVERAGE				
0.612±0.065±0.043		COFFMAN 91	MRK3	e^+e^- 3.77 GeV
0.52 ±0.18	15	SCHINDLER 81	MRK2	e^+e^- 3.771 GeV
0.39 ±0.29	3	VUILLEMIN 78	MRK1	e^+e^- 3.772 GeV

$\Gamma(K^+ \text{anything})/\Gamma_{total}$ — Γ_4/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.058±0.014 OUR AVERAGE					
0.055±0.013±0.009		COFFMAN	91	MRK3	e^+e^- 3.77 GeV
$0.08\ ^{+0.06}_{-0.05}$		AGUILAR-...	87E	HYBR	πp, $p p$ 360, 400 GeV
0.06 ±0.04	12	SCHINDLER	81	MRK2	e^+e^- 3.771 GeV
0.06 ±0.06	2	VUILLEMIN	78	MRK1	e^+e^- 3.772 GeV

D^+ and $D^0 \rightarrow$ (η anything) / (total D^+ and D^0)

If measured at the $\psi(3770)$, this quantity is a weighted average of D^+ (44%) and D^0 (56%) branching fractions. Only the experiment at E_{cm} = 3.77 GeV is used.

VALUE	DOCUMENT ID		TECN	COMMENT
<0.13	PARTRIDGE	81	CBAL	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.02	[11] BRANDELIK	79	DASP	e^+e^- 4.03 GeV

[11] The BRANDELIK 79 result is based on the absence of an η signal at E_{cm} = 4.03 GeV. PARTRIDGE 81 observes a substantially higher η cross section at 4.03 GeV.

$\Gamma(c/\overline{c} \rightarrow \mu^+ \text{anything})/\Gamma(c/\overline{c} \rightarrow \text{anything})$

This is the average branching ratio for charm $\rightarrow \mu^+$X. The mixture of charmed particles is unknown and may actually contain states other than D mesons. We don't put this result in the Meson Summary Table.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$0.081^{+0.010}_{-0.009}$ OUR AVERAGE					
$0.086\pm0.017^{+0.008}_{-0.007}$	69	[12] ALBRECHT	92F	ARG	$e^+e^- \approx$ 10 GeV
0.078±0.009±0.012		ONG	88	MRK2	e^+e^- 29 GeV
0.078±0.015±0.02		BARTEL	87	JADE	e^+e^- 34.6 GeV
$0.082\pm0.012^{+0.02}_{-0.01}$		ALTHOFF	84G	TASS	e^+e^- 34.5 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.089±0.018±0.025		BARTEL	85J	JADE	See BARTEL 87

[12] ALBRECHT 92F uses the excess of right-sign over wrong-sign leptons in a sample of events tagged by fully reconstructed $D^*(2010)^+ \rightarrow D^0\pi^+$ decays.

Leptonic and semileptonic modes

$\Gamma(\mu^+\nu_\mu)/\Gamma_{total}$ — Γ_7/Γ

See the "Note on Pseudoscalar-Meson Decay Constants" in the $\pi^\pm$ Listings for the limit inferred on the D^+ decay constant from the limit here on $\Gamma(\mu^+\nu_\mu)/\Gamma_{total}$.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<0.00072	90		ADLER	88B	MRK3	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.02	90	0	[13] AUBERT	83	SPEC	μ^+Fe, 250 GeV

[13] AUBERT 83 obtains an upper limit 0.014 assuming the final state contains equal amounts of (D^+,D^-), (D^+,$\overline{D}^0$), (D^-,D^0), and (D^0,$\overline{D}^0$). We quote the limit they get under more general assumptions.

$\Gamma(\overline{K}^0 \ell^+ \nu_\ell)/\Gamma_{total}$ — Γ_8/Γ

We average our $\overline{K}^0 e^+ \nu_e$ and $\overline{K}^0 \mu^+ \nu_\mu$ branching fractions, after multiplying the latter by a phase-space factor of 1.03 to be able to use it with the $\overline{K}^0 e^+ \nu_e$ fraction. Hence our ℓ^+ here is really an e^+.

VALUE	DOCUMENT ID		COMMENT
0.068±0.008 OUR AVERAGE			
0.067±0.009	PDG	98	Our $\Gamma(\overline{K}^0 e^+ \nu_e)/\Gamma_{total}$
$0.072^{+0.031}_{-0.020}$	PDG	98	$1.03 \times$ our $\Gamma(\overline{K}^0 \mu^+ \nu_\mu)/\Gamma_{total}$

$\Gamma(\overline{K}^0 e^+ \nu_e)/\Gamma_{total}$ — Γ_9/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.067±0.009 OUR FIT					
$\mathbf{0.06\ ^{+0.022}_{-0.013} \pm 0.007}$	13	BAI	91	MRK3	$e^+ e^- \approx$ 3.77 GeV

$\Gamma(\overline{K}^0 e^+ \nu_e)/\Gamma(\overline{K}^0 \pi^+)$ — Γ_9/Γ_{33}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
2.32±0.31 OUR FIT					
2.60±0.35±0.26	186	[14] BEAN	93C	CLE2	$e^+ e^- \approx \Upsilon(4S)$

[14] BEAN 93C uses $\overline{K}^0 \mu^+ \nu_\mu$ as well as $\overline{K}^0 e^+ \nu_e$ events and makes a small phase-space adjustment to the number of the μ^+ events to use them as e^+ events.

$\Gamma(\overline{K}^0 e^+ \nu_e)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_9/Γ_{34}

VALUE	DOCUMENT ID		TECN	COMMENT
0.74±0.10 OUR FIT				
0.66±0.09±0.14	ANJOS	91C	E691	γ Be 80–240 GeV

$\Gamma(\overline{K}^0 \mu^+ \nu_\mu)/\Gamma_{total}$ — Γ_{10}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.07\ ^{+0.028}_{-0.016} \pm 0.012}$	14	BAI	91	MRK3	$e^+ e^- \approx$ 3.77 GeV

$\Gamma(\overline{K}^0 \mu^+ \nu_\mu)/\Gamma(\mu^+ \text{anything})$ — Γ_{10}/Γ_6

VALUE	EVTS	DOCUMENT ID		COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.76±0.06	84	[15] AOKI	88	π^- emulsion

[15] From topological branching ratios in emulsion with an identified muon.

$\Gamma(K^- \pi^+ e^+ \nu_e)/\Gamma_{total}$ — Γ_{11}/Γ

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.041^{+0.009}_{-0.007}}$ **OUR FIT**						
$\mathbf{0.035^{+0.012}_{-0.007} \pm 0.004}$		14	[16] BAI	91	MRK3	$e^+ e^- \approx$ 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.057	90		[17] AGUILAR-...	87F	HYBR	πp, $p p$ 360, 400 GeV

[16] BAI 91 finds that a fraction $0.79^{+0.15}_{-0.17}{}^{+0.09}_{-0.03}$ of combined D^+ and D^0 decays to $\overline{K} \pi e^+ \nu_e$ (24 events) are $\overline{K}^*(892) e^+ \nu_e$.

[17] AGUILAR-BENITEZ 87F computes the branching fraction using topological normalization.

$\Gamma(\overline{K}^*(892)^0 \ell^+ \nu_\ell)/\Gamma_{total}$ — Γ_{24}/Γ

We average our $\overline{K}^{*0} e^+ \nu_e$ and $\overline{K}^{*0} \mu^+ \nu_\mu$ branching fractions, after multiplying the latter by a phase-space factor of 1.05 to be able to use it with the $\overline{K}^{*0} e^+ \nu_e$ fraction. Hence our ℓ^+ here is really an e^+.

VALUE	DOCUMENT ID		COMMENT
0.047±0.004 OUR AVERAGE			
0.048±0.005	PDG	98	Our $\Gamma(\overline{K}^{*0} e^+ \nu_e)/\Gamma_{total}$
0.046±0.006	PDG	98	1.05 × our $\Gamma(\overline{K}^{*0} \mu^+ \nu_\mu)/\Gamma_{total}$

$\Gamma(\overline{K}^*(892)^0 e^+ \nu_e)/\Gamma(K^- \pi^+ e^+ \nu_e)$ — Γ_{25}/Γ_{11}

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$1.16^{+0.21}_{-0.24}$ OUR FIT					
1.0 ±0.3	35	ADAMOVICH	91	OMEG	π^- 340 GeV

$\Gamma(\overline{K}^*(892)^0 e^+ \nu_e)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{25}/Γ_{34}

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.53±0.05 OUR FIT					
0.54±0.05 OUR AVERAGE					
0.67±0.09±0.07	710	[18] BEAN	93C	CLE2	$e^+ e^- \approx \Upsilon(4S)$
0.62±0.15±0.09	35	ADAMOVICH	91	OMEG	π^- 340 GeV
0.55±0.08±0.10	880	ALBRECHT	91	ARG	$e^+ e^- \approx$ 10.4 GeV
0.49±0.04±0.05		ANJOS	89B	E691	Photoproduction

[18] BEAN 93C uses $\overline{K}^{*0} \mu^+ \nu_\mu$ as well as $\overline{K}^{*0} e^+ \nu_e$ events and makes a small phase-space adjustment to the number of the μ^+ events to use them as e^+ events.

$\Gamma(K^- \pi^+ e^+ \nu_e \text{ nonresonant})/\Gamma_{total}$ — Γ_{13}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.007	90	[19] ANJOS	89B	E691	Photoproduction

[19] ANJOS 89B assumes a $\Gamma(D^+ \rightarrow K^- \pi^+ \pi^+)/\Gamma_{total} = 9.1 \pm 1.3 \pm 0.4\%$.

$\Gamma(K^- \pi^+ \mu^+ \nu_\mu)/\Gamma_{total}$ — $\Gamma_{14}/\Gamma = (\Gamma_{16}+\frac{2}{3}\Gamma_{26})/\Gamma$

VALUE	DOCUMENT ID
0.032±0.004 OUR FIT	Error includes scale factor of 1.1.

$\Gamma(\overline{K}^*(892)^0 \mu^+ \nu_\mu)/\Gamma_{total}$ — Γ_{26}/Γ

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.044 ±0.006 OUR FIT	Error includes scale factor of 1.1.				
0.0325±0.0071±0.0075	224	[20] KODAMA	92C	E653	π^- emulsion 600 GeV

[20] KODAMA 92C measures $\Gamma(D^+ \rightarrow \overline{K}^{*0} \mu^+ \nu_\mu)/\Gamma(D^0 \rightarrow K^- \mu^+ \nu_\mu) = 0.43 \pm 0.09 \pm 0.09$ and then uses $\Gamma(D^0 \rightarrow K^- \mu^+ \nu_\mu) = (7.0 \pm 0.7) \times 10^{10}\ \mathrm{s}^{-1}$ to get the quoted branching fraction. See also the footnote to KODAMA 92C in the next data block.

$\Gamma(\overline{K}^*(892)^0 \mu^+ \nu_\mu)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{26}/Γ_{34}

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.49±0.06 OUR FIT					
0.53±0.06 OUR AVERAGE					
0.56±0.04±0.06	875	FRABETTI	93E	E687	γ Be $\overline{E}_\gamma \approx$ 200 GeV
0.46±0.07±0.08	224	[21] KODAMA	92C	E653	π^- emulsion 600 GeV

[21] KODAMA 92C uses the same $\overline{K}^{*0} \mu^+ \nu_\mu$ events normalizing instead with $D^0 \to K^- \mu^+ \nu_\mu$ events, as reported in the preceding data block.

$\Gamma(K^- \pi^+ \mu^+ \nu_\mu \text{ nonresonant})/\Gamma(K^- \pi^+ \mu^+ \nu_\mu)$ — $\Gamma_{16}/\Gamma_{14} = \Gamma_{16}/(\Gamma_{16}+\frac{2}{3}\Gamma_{26})$

VALUE	DOCUMENT ID		TECN	COMMENT
0.083±0.029 OUR FIT				
0.083±0.029	FRABETTI	93E	E687	< 0.12 (90% CL)

$\Gamma(\overline{K}^0 \pi^+ \pi^- e^+ \nu_e)/\Gamma_{total}$ — Γ_{17}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.022^{+0.047}_{-0.006}\pm0.004$	1	[22] AGUILAR-...	87F	HYBR	πp, $p p$ 360, 400 GeV

[22] AGUILAR-BENITEZ 87F computes the branching fraction using topological normalization.

$\Gamma(K^- \pi^+ \pi^0 e^+ \nu_e)/\Gamma_{total}$ — Γ_{18}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.044^{+0.052}_{-0.013}\pm0.007$	2	[23] AGUILAR-...	87F	HYBR	πp, $p p$ 360, 400 GeV

[23] AGUILAR-BENITEZ 87F computes the branching fraction using topological normalization.

$\Gamma((\overline{K}^*(892)\pi)^0 e^+ \nu_e)/\Gamma_{total}$ — Γ_{19}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.012	90	ANJOS	92	E691	Photoproduction

$\Gamma((\overline{K}\pi\pi)^0 e^+ \nu_e \text{ non-}\overline{K}^*(892))/\Gamma_{total}$ — Γ_{20}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.009	90	ANJOS	92	E691	Photoproduction

$\Gamma(K^- \pi^+ \pi^0 \mu^+ \nu_\mu)/\Gamma(K^- \pi^+ \mu^+ \nu_\mu)$ — $\Gamma_{21}/\Gamma_{14} = \Gamma_{21}/(\Gamma_{16}+\frac{2}{3}\Gamma_{26})$

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.042	90	FRABETTI	93E	E687	γ Be $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma(\pi^0 \ell^+ \nu_\ell)/\Gamma(\overline{K}^0 \ell^+ \nu_\ell)$ Γ_{22}/Γ_8

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.046±0.014±0.017	100	[24] BARTELT	97	CLE2	$e^+e^- \approx \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.085±0.027±0.014	53	[25] ALAM	93	CLE2	See BARTELT 97

[24] BARTELT 97 thus directly measures the product of ratios squared of CKM matrix elements and form factors at q^2=0: $|V_{cd}/V_{cs}|^2 \cdot |f_+^\pi(0)/f_+^K(0)|^2 = 0.046 \pm 0.014 \pm 0.017$.

[25] ALAM 93 thus directly measures the product of ratios squared of CKM matrix elements and form factors at q^2=0: $|V_{cd}/V_{cs}|^2 \cdot |f_+^\pi(0)/f_+^K(0)|^2 = 0.085 \pm 0.027 \pm 0.014$.

$\Gamma(\pi^+\pi^- e^+ \nu_e)/\Gamma_{\text{total}}$ Γ_{23}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.057	90	[26] AGUILAR-...	87F	HYBR	πp, $p p$ 360, 400 GeV

[26] AGUILAR-BENITEZ 87F computes the branching fraction using topological normalization.

$\Gamma(\rho^0 e^+ \nu_e)/\Gamma_{\text{total}}$ Γ_{27}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0037	90	BAI	91	MRK3	$e^+e^- \approx$ 3.77 GeV

$\Gamma(\rho^0 e^+ \nu_e)/\Gamma(\overline{K}^*(892)^0 e^+ \nu_e)$ Γ_{27}/Γ_{25}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.045±0.014±0.009	49	[27] AITALA	97	E791	π^- nucleus, 500 GeV

[27] AITALA 97 explicitly subtracts $D^+ \to \eta' e^+ \nu_e$ and other backgrounds to get this result.

$\Gamma(\rho^0 \mu^+ \nu_\mu)/\Gamma(\overline{K}^*(892)^0 \mu^+ \nu_\mu)$ Γ_{28}/Γ_{26}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.061±0.014 OUR AVERAGE					
0.051±0.015±0.009	54	[28] AITALA	97	E791	π^- nucleus, 500 GeV
0.079±0.019±0.013	39	[29] FRABETTI	97	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.044^{+0.031}_{-0.025}\pm0.014$	4	[30] KODAMA	93C	E653	π^- emulsion 600 GeV

[28] AITALA 97 explicitly subtracts $D^+ \to \eta' \mu^+ \nu_\mu$ and other backgrounds to get this result.

[29] Because the reconstruction efficiency for photons is low, this FRABETTI 97 result also includes any $D^+ \to \eta' \mu^+ \nu_\mu \to \gamma \rho^0 \mu^+ \nu_\mu$ events in the numerator.

[30] This KODAMA 93C result is based on a final signal of $4.0^{+2.8}_{-2.3} \pm 1.3$ events; the estimates of backgrounds that affect this number are somewhat model dependent.

$\Gamma(\phi e^+ \nu_e)/\Gamma_{\text{total}}$ Γ_{29}/Γ

Decay modes of the ϕ not included in the search are corrected for.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0209	90	BAI	91	MRK3	$e^+e^- \approx$ 3.77 GeV

$\Gamma(\phi \mu^+ \nu_\mu)/\Gamma_{total}$ — Γ_{30}/Γ

Decay modes of the ϕ not included in the search are corrected for.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0372	90	BAI	91	MRK3	$e^+ e^- \approx$ 3.77 GeV

$\Gamma(\eta \ell^+ \nu_\ell)/\Gamma(\pi^0 \ell^+ \nu_\ell)$ — Γ_{31}/Γ_{22}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.5	90	BARTELT	97	CLE2	$e^+ e^- \approx \Upsilon(4S)$

$\Gamma(\eta'(958) \mu^+ \nu_\mu)/\Gamma(\overline{K}^*(892)^0 \mu^+ \nu_\mu)$ — Γ_{32}/Γ_{26}

Decay modes of the $\eta'(958)$ not included in the search are corrected for.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.20	90	KODAMA	93B	E653	π^- emulsion 600 GeV

Hadronic modes with a $\overline{K}$ or $\overline{K} K \overline{K}$

$\Gamma(\overline{K}^0 \pi^+)/\Gamma_{total}$ — Γ_{33}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0289±0.0026 OUR FIT Error includes scale factor of 1.1.					
0.032 ±0.004 OUR AVERAGE					
0.032 ±0.005 ±0.002	161	ADLER	88C	MRK3	$e^+ e^-$ 3.77 GeV
0.033 ±0.009	36	[31] SCHINDLER	81	MRK2	$e^+ e^-$ 3.771 GeV
0.033 ±0.013	17	[32] PERUZZI	77	MRK1	$e^+ e^-$ 3.77 GeV

[31] SCHINDLER 81 (MARK-2) measures $\sigma(e^+ e^- \rightarrow \psi(3770)) \times$ branching fraction to be 0.14 ± 0.03 nb. We use the MARK-3 (ADLER 88C) value of $\sigma = 4.2 \pm 0.6 \pm 0.3$ nb.

[32] PERUZZI 77 (MARK-1) measures $\sigma(e^+ e^- \rightarrow \psi(3770)) \times$ branching fraction to be 0.14 ± 0.05 nb. We use the MARK-3 (ADLER 88C) value of $\sigma = 4.2 \pm 0.6 \pm 0.3$ nb.

$\Gamma(\overline{K}^0 \pi^+)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{33}/Γ_{34}

It is generally assumed for modes such as $D^+ \rightarrow \overline{K}^0 \pi^+$ that

$$\Gamma(D^+ \rightarrow \overline{K}^0 \pi^+) = 2\Gamma(D^+ \rightarrow K^0_S \pi^+);$$

it is the latter Γ that is actually measured. BIGI 95 points out that interference between Cabibbo-allowed and doubly Cabibbo-suppressed amplitudes, where both occur, could invalidate this assumption by a few percent.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.321±0.025 OUR FIT Error includes scale factor of 1.1.					
0.32 ±0.04 OUR AVERAGE Error includes scale factor of 1.4.					
0.348±0.024±0.022	473	[33] BISHAI	97	CLE2	$e^+ e^- \approx \Upsilon(4S)$
0.274±0.030±0.031	264	ANJOS	90C	E691	Photoproduction

[33] See BISHAI 97 for an isospin analysis of $D^+ \rightarrow \overline{K} \pi$ amplitudes.

$\Gamma(K^- \pi^+ \pi^+)/\Gamma_{total}$ — Γ_{34}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.090±0.006 OUR FIT					
0.091±0.007 OUR AVERAGE					
0.093±0.006±0.008	1502	[34] BALEST	94	CLE2	$e^+ e^- \approx \Upsilon(4S)$
0.091±0.013±0.004	1164	ADLER	88C	MRK3	$e^+ e^-$ 3.77 GeV
0.091±0.019	239	[35] SCHINDLER	81	MRK2	$e^+ e^-$ 3.771 GeV
0.086±0.020	85	[36] PERUZZI	77	MRK1	$e^+ e^-$ 3.77 GeV

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

$0.064^{+0.015}_{-0.014}$		[37] BARLAG	92C	ACCM	π^- Cu 230 GeV
$0.063^{+0.028}_{-0.014}\pm0.011$	8	[37] AGUILAR-...	87F	HYBR	πp, $p p$ 360, 400 GeV

[34] BALEST 94 measures the ratio of $D^+ \to K^-\pi^+\pi^+$ and $D^0 \to K^-\pi^+$ branching fractions to be 2.35 ± 0.16 ± 0.16 and uses their absolute measurement of the $D^0 \to K^-\pi^+$ fraction (AKERIB 93).

[35] SCHINDLER 81 (MARK-2) measures $\sigma(e^+e^- \to \psi(3770))$ × branching fraction to be 0.38 ± 0.05 nb. We use the MARK-3 (ADLER 88C) value of $\sigma = 4.2 \pm 0.6 \pm 0.3$ nb.

[36] PERUZZI 77 (MARK-1) measures $\sigma(e^+e^- \to \psi(3770))$ × branching fraction to be 0.36 ± 0.06 nb. We use the MARK-3 (ADLER 88C) value of $\sigma = 4.2 \pm 0.6 \pm 0.3$ nb.

[37] AGUILAR-BENITEZ 87F and BARLAG 92C compute the branching fraction by topological normalization.

$\Gamma(\overline{K}^*(892)^0\pi^+)/\Gamma(K^-\pi^+\pi^+)$ Γ_{73}/Γ_{34}

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
0.212±0.016 OUR FIT					
0.210±0.015 OUR AVERAGE					
0.206±0.009±0.014		FRABETTI	94G	E687	γ Be, $\overline{E}_\gamma \approx 220$ GeV
0.255±0.014±0.050		ANJOS	93	E691	γ Be 90–260 GeV
0.21 ±0.06 ±0.06		ALVAREZ	91B	NA14	Photoproduction
0.20 ±0.02 ±0.11		ADLER	87	MRK3	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.053	90	SCHINDLER	81	MRK2	e^+e^- 3.771 GeV

$\Gamma(\overline{K}^*_0(1430)^0\pi^+)/\Gamma(K^-\pi^+\pi^+)$ Γ_{82}/Γ_{34}

Unseen decay modes of the $\overline{K}^*_0(1430)^0$ are included.

VALUE	DOCUMENT ID		TECN	COMMENT
0.41 ±0.04 OUR AVERAGE				
0.458±0.035±0.094	FRABETTI	94G	E687	γ Be, $\overline{E}_\gamma \approx 220$ GeV
0.400±0.031±0.027	ANJOS	93	E691	γ Be 90–260 GeV

$\Gamma(\overline{K}^*(1680)^0\pi^+)/\Gamma(K^-\pi^+\pi^+)$ Γ_{83}/Γ_{34}

Unseen decay modes of the $\overline{K}^*(1680)^0$ are included.

VALUE	DOCUMENT ID		TECN	COMMENT
0.160±0.032 OUR AVERAGE Error includes scale factor of 1.1.				
0.182±0.023±0.028	FRABETTI	94G	E687	γ Be, $\overline{E}_\gamma \approx 220$ GeV
0.113±0.015±0.050	ANJOS	93	E691	γ Be 90–260 GeV

$\Gamma(K^-\pi^+\pi^+ \text{ nonresonant})/\Gamma(K^-\pi^+\pi^+)$ Γ_{38}/Γ_{34}

VALUE	DOCUMENT ID		TECN	COMMENT
0.95 ±0.07 OUR AVERAGE				
0.998±0.037±0.072	FRABETTI	94G	E687	γ Be, $\overline{E}_\gamma \approx 220$ GeV
0.838±0.088±0.275	ANJOS	93	E691	γ Be 90–260 GeV
0.79 ±0.07 ±0.15	ADLER	87	MRK3	e^+e^- 3.77 GeV

$\Gamma(\overline{K}^0\pi^+\pi^0)/\Gamma_{total}$ Γ_{39}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.097±0.030 OUR FIT Error includes scale factor of 1.1.					
0.107±0.029 OUR AVERAGE					
0.102±0.025±0.016	159	ADLER	88C	MRK3	e^+e^- 3.77 GeV
0.19 ±0.12	10	[38] SCHINDLER	81	MRK2	e^+e^- 3.771 GeV

[38] SCHINDLER 81 (MARK-2) measures $\sigma(e^+e^- \to \psi(3770))$ × branching fraction to be 0.78 ± 0.48 nb. We use the MARK-3 (ADLER 88C) value of σ = 4.2 ± 0.6 ± 0.3 nb.

$\Gamma(\overline{K}^0\rho^+)/\Gamma(\overline{K}^0\pi^+\pi^0)$ Γ_{40}/Γ_{39}

VALUE	DOCUMENT ID		TECN	COMMENT
0.68±0.08±0.12	ADLER	87	MRK3	e^+e^- 3.77 GeV

$\Gamma(\overline{K}^*(892)^0\pi^+)/\Gamma(\overline{K}^0\pi^+\pi^0)$ Γ_{73}/Γ_{39}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.20±0.06 OUR FIT				
0.57±0.18±0.18	ADLER	87	MRK3	e^+e^- 3.77 GeV

$\Gamma(\overline{K}^0\pi^+\pi^0\ \text{nonresonant})/\Gamma(\overline{K}^0\pi^+\pi^0)$ Γ_{42}/Γ_{39}

VALUE	DOCUMENT ID		TECN	COMMENT
0.13±0.07±0.08	ADLER	87	MRK3	e^+e^- 3.77 GeV

$\Gamma(K^-\pi^+\pi^+\pi^0)/\Gamma_{total}$ Γ_{43}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.064±0.011 OUR FIT					
0.058±0.012±0.012	142	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.034^{+0.056}_{-0.070}$		[39] BARLAG	92C	ACCM	π^- Cu 230 GeV
$0.022^{+0.047}_{-0.006}\pm0.004$	1	[39] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV
$0.063^{+0.014}_{-0.013}\pm0.012$	175	BALTRUSAIT...	86E	MRK3	See COFFMAN 92B

[39] AGUILAR-BENITEZ 87F and BARLAG 92C compute the branching fraction by topological normalization.

$\Gamma(K^-\pi^+\pi^+\pi^0)/\Gamma(K^-\pi^+\pi^+)$ Γ_{43}/Γ_{34}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.71±0.12 OUR FIT					
0.76±0.11±0.12	91	ANJOS	92C	E691	γ Be 90–260 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.69±0.10±0.16		ANJOS	89E	E691	See ANJOS 92C
$0.57^{+0.65}_{-0.17}$	1	AGUILAR-...	83B	HYBR	$\pi^- p$, 360 GeV

$\Gamma(\overline{K}^*(892)^0\rho^+\ \text{total})/\Gamma(K^-\pi^+\pi^+\pi^0)$ Γ_{74}/Γ_{43}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.33±0.165±0.12	[40] ANJOS	92C	E691	γ Be 90–260 GeV

[40] See, however, the next entry, where the two experiments disagree completely.

$\Gamma\big(\overline{K}^*(892)^0 \rho^+ \textit{S}\text{-wave}\big)/\Gamma\big(K^- \pi^+ \pi^+ \pi^0\big)$ — Γ_{75}/Γ_{43}

Unseen decay modes of the $\overline{K}^*(892)^0$ are included. The two experiments here disagree completely.

VALUE	DOCUMENT ID		TECN	COMMENT
0.26 ±0.25 OUR AVERAGE Error includes scale factor of 3.1.				
0.15 ±0.075±0.045	ANJOS	92C	E691	γ Be 90–260 GeV
0.833±0.116±0.165	COFFMAN	92B	MRK3	$e^+ e^-$ 3.77 GeV

$\Gamma\big(\overline{K}^*(892)^0 \rho^+ \textit{P}\text{-wave}\big)/\Gamma_{\text{total}}$ — Γ_{76}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.001	90	ANJOS	92C	E691	γ Be 90–260 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.005	90	COFFMAN	92B	MRK3	$e^+ e^-$ 3.77 GeV

$\Gamma\big(\overline{K}^*(892)^0 \rho^+ \textit{D}\text{-wave}\big)/\Gamma\big(K^- \pi^+ \pi^+ \pi^0\big)$ — Γ_{77}/Γ_{43}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.15±0.09±0.045	ANJOS	92C	E691	γ Be 90–260 GeV

$\Gamma\big(\overline{K}^*(892)^0 \rho^+ \textit{D}\text{-wave longitudinal}\big)/\Gamma_{\text{total}}$ — Γ_{78}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.007	90	COFFMAN	92B	MRK3	$e^+ e^-$ 3.77 GeV

$\Gamma\big(\overline{K}_1(1400)^0 \pi^+\big)/\Gamma\big(K^- \pi^+ \pi^+ \pi^0\big)$ — Γ_{80}/Γ_{43}

Unseen decay modes of the $\overline{K}_1(1400)^0$ are included.

VALUE	DOCUMENT ID		TECN	COMMENT
0.77 ±0.20 OUR FIT				
0.907±0.218±0.180	COFFMAN	92B	MRK3	$e^+ e^-$ 3.77 GeV

$\Gamma\big(K^- \rho^+ \pi^+ \text{total}\big)/\Gamma\big(K^- \pi^+ \pi^+ \pi^0\big)$ — Γ_{88}/Γ_{43}

This includes $\overline{K}^*(892)^0 \rho^+$, *etc.* The next entry gives the specifically 3-body fraction.

VALUE	DOCUMENT ID		TECN	COMMENT
0.48±0.13±0.09	ANJOS	92C	E691	γ Be 90–260 GeV

$\Gamma\big(K^- \rho^+ \pi^+ \text{3-body}\big)/\Gamma\big(K^- \pi^+ \pi^+ \pi^0\big)$ — Γ_{89}/Γ_{43}

VALUE	DOCUMENT ID		TECN	COMMENT
0.17 ±0.06 OUR AVERAGE				
0.18 ±0.08 ±0.04	ANJOS	92C	E691	γ Be 90–260 GeV
0.159±0.065±0.060	COFFMAN	92B	MRK3	$e^+ e^-$ 3.77 GeV

$\Gamma\big(\overline{K}^*(892)^0 \pi^+ \pi^0 \text{total}\big)/\Gamma\big(K^- \pi^+ \pi^+ \pi^0\big)$ — Γ_{84}/Γ_{43}

This includes $\overline{K}^*(892)^0 \rho^+$, *etc.* The next two entries give the specifically 3-body fraction. Unseen decay modes of the $\overline{K}^*(892)^0$ are included.

VALUE	DOCUMENT ID		TECN	COMMENT
1.05±0.11±0.08	ANJOS	92C	E691	γ Be 90–260 GeV

$\Gamma(\overline{K}^*(892)^0\pi^+\pi^0$ 3-body$)/\Gamma_{total}$ — Γ_{85}/Γ

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

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.008	90	[41] COFFMAN 92B	MRK3	e^+e^- 3.77 GeV

[41] See, however, the next entry: ANJOS 92C sees a large signal in this channel.

$\Gamma(\overline{K}^*(892)^0\pi^+\pi^0$ 3-body$)/\Gamma(K^-\pi^+\pi^+\pi^0)$ — Γ_{85}/Γ_{43}

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

VALUE	DOCUMENT ID	TECN	COMMENT
0.66±0.09±0.17	ANJOS 92C	E691	γ Be 90–260 GeV

$\Gamma(K^*(892)^-\pi^+\pi^+$ 3-body$)/\Gamma(K^-\pi^+\pi^+\pi^0)$ — Γ_{87}/Γ_{43}

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

VALUE	DOCUMENT ID	TECN	COMMENT
0.32±0.14 OUR FIT Error includes scale factor of 1.1.			
0.24±0.12±0.09	ANJOS 92C	E691	γ Be 90–260 GeV

$\Gamma(K^-\pi^+\pi^+\pi^0$ nonresonant$)/\Gamma_{total}$ — Γ_{51}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.002	90	[42] ANJOS 92C	E691	γ Be 90–260 GeV

[42] Whereas ANJOS 92C finds no signal here, COFFMAN 92B finds a fairly large one; see the next entry.

$\Gamma(K^-\pi^+\pi^+\pi^0$ nonresonant$)/\Gamma(K^-\pi^+\pi^+\pi^0)$ — Γ_{51}/Γ_{43}

VALUE	DOCUMENT ID	TECN	COMMENT
0.184±0.070±0.050	COFFMAN 92B	MRK3	e^+e^- 3.77 GeV

$\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)/\Gamma_{total}$ — Γ_{52}/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.070±0.009 OUR FIT				
0.071±0.016 OUR AVERAGE				
0.066±0.015±0.005	168	ADLER 88C	MRK3	e^+e^- 3.77 GeV
0.12 ±0.05	21	[43] SCHINDLER 81	MRK2	e^+e^- 3.771 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.042^{+0.019}_{-0.017}$		[44] BARLAG 92C	ACCM	π^- Cu 230 GeV
$0.243^{+0.064}_{-0.041}\pm0.041$	11	[44] AGUILAR-... 87F	HYBR	πp, pp 360, 400 GeV

[43] SCHINDLER 81 (MARK-2) measures $\sigma(e^+e^- \rightarrow \psi(3770)) \times$ branching fraction to be 0.51 ± 0.08 nb. We use the MARK-3 (ADLER 88C) value of $\sigma = 4.2 \pm 0.6 \pm 0.3$ nb.

[44] AGUILAR-BENITEZ 87F and BARLAG 92C compute the branching fraction by topological normalization.

$\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{52}/Γ_{34}

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.78±0.10 OUR FIT				
0.77±0.07±0.11	229	ANJOS 92C	E691	γ Be 90–260 GeV

$\Gamma\big(\overline{K}^0 a_1(1260)^+\big)/\Gamma\big(\overline{K}^0\pi^+\pi^+\pi^-\big)$ Γ_{71}/Γ_{52}

Unseen decay modes of the $a_1(1260)^+$ are included.

VALUE	DOCUMENT ID		TECN	COMMENT
1.15 ±0.19 OUR AVERAGE	Error includes scale factor of 1.1.			
1.66 ±0.28 ±0.40	ANJOS	92C	E691	γ Be 90–260 GeV
1.078±0.114±0.140	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

$\Gamma\big(\overline{K}^0 a_2(1320)^+\big)/\Gamma_{\text{total}}$ Γ_{72}/Γ

Unseen decay modes of the $a_2(1320)^+$ are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.003	90	ANJOS	92C	E691	γ Be 90–260 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.008	90	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

$\Gamma\big(\overline{K}_1(1270)^0\pi^+\big)/\Gamma_{\text{total}}$ Γ_{79}/Γ

Unseen decay modes of the $\overline{K}_1(1270)^0$ are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.007	90	ANJOS	92C	E691	γ Be 90–260 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.011	90	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

$\Gamma\big(\overline{K}_1(1400)^0\pi^+\big)/\Gamma_{\text{total}}$ Γ_{80}/Γ

Unseen decay modes of the $\overline{K}_1(1400)^0$ are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.009	90	[45] ANJOS	92C	E691	γ Be 90–260 GeV

[45] ANJOS 92C sees no evidence for $\overline{K}_1(1400)^0\pi^+$ in either the $\overline{K}^0\pi^+\pi^+\pi^-$ or $K^-\pi^+\pi^+\pi^0$ channels, whereas COFFMAN 92B finds the $\overline{K}_1(1400)^0\pi^+$ branching fraction to be large; see the next entry.

$\Gamma\big(\overline{K}_1(1400)^0\pi^+\big)/\Gamma\big(\overline{K}^0\pi^+\pi^+\pi^-\big)$ Γ_{80}/Γ_{52}

Unseen decay modes of the $\overline{K}_1(1400)^0$ are included.

VALUE	DOCUMENT ID		TECN	COMMENT
0.70 ±0.17 OUR FIT				
0.623±0.106±0.180	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

$\Gamma\big(\overline{K}^*(1410)^0\pi^+\big)/\Gamma_{\text{total}}$ Γ_{81}/Γ

Unseen decay modes of the $\overline{K}^*(1410)^0$ are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.007	90	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

$\Gamma\big(K^*(892)^-\pi^+\pi^+\text{total}\big)/\Gamma\big(\overline{K}^0\pi^+\pi^+\pi^-\big)$ Γ_{86}/Γ_{52}

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.41±0.14	14	ALEEV	94	BIS2	nN 20–70 GeV

$\Gamma(K^*(892)^-\pi^+\pi^+ \text{3-body})/\Gamma_{total}$ — Γ_{87}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
0.020±0.009 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.013	90	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

$\Gamma(K^*(892)^-\pi^+\pi^+ \text{3-body})/\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)$ — Γ_{87}/Γ_{52}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.29±0.13 OUR FIT Error includes scale factor of 1.1.				
0.50±0.09±0.21	ANJOS	92C	E691	γ Be 90–260 GeV

$\Gamma(\overline{K}^0\rho^0\pi^+ \text{total})/\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)$ — Γ_{90}/Γ_{52}

This includes $\overline{K}^0 a_1(1260)^+$. The next two entries give the specifically 3-body reaction.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
0.60±0.10±0.17	90	ANJOS	92C	E691	γ Be 90–260 GeV

$\Gamma(\overline{K}^0\rho^0\pi^+ \text{3-body})/\Gamma_{total}$ — Γ_{91}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.004	90	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

$\Gamma(\overline{K}^0\rho^0\pi^+ \text{3-body})/\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)$ — Γ_{91}/Γ_{52}

VALUE	DOCUMENT ID		TECN	COMMENT
0.07±0.04±0.06	ANJOS	92C	E691	γ Be 90–260 GeV

$\Gamma(\overline{K}^0 f_0(980)\pi^+)/\Gamma_{total}$ — Γ_{92}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.005	90	ANJOS	92C	E691	γ Be 90–260 GeV

$\Gamma(\overline{K}^0\pi^+\pi^+\pi^- \text{nonresonant})/\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)$ — Γ_{58}/Γ_{52}

VALUE	DOCUMENT ID		TECN	COMMENT
0.12±0.06 OUR AVERAGE				
0.10±0.04 ±0.06	ANJOS	92C	E691	γ Be 90–260 GeV
0.17±0.056±0.100	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

$\Gamma(K^-\pi^+\pi^+\pi^+\pi^-)/\Gamma_{total}$ — Γ_{59}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.0037^{+0.0012}_{-0.0010}$	[46] BARLAG	92C	ACCM	π^- Cu 230 GeV

[46] BARLAG 92C computes the branching fraction using topological normalization.

$\Gamma(K^-\pi^+\pi^+\pi^+\pi^-)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{59}/Γ_{34}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.080±0.009 OUR FIT					
0.083±0.009 OUR AVERAGE					
0.077±0.008±0.010	239	FRABETTI	97C	E687	γ Be, $\overline{E}_\gamma \approx$ 200 GeV
0.09 ±0.01 ±0.01	113	ANJOS	90D	E691	Photoproduction

$\Gamma(\overline{K}^*(892)^0\pi^+\pi^+\pi^-)/\Gamma(K^-\pi^+\pi^+\pi^+\pi^-)$ — Γ_{93}/Γ_{59}

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

VALUE	DOCUMENT ID		TECN	COMMENT
1.1 ±0.4 OUR FIT Error includes scale factor of 1.8.				
1.25±0.12±0.23	ANJOS	90D	E691	Photoproduction

$\Gamma(\overline{K}^*(892)^0\rho^0\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{94}/Γ_{34}

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

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.032^{+0.019}_{-0.017}}$ **OUR FIT** Error includes scale factor of 1.8.				
0.023±0.010±0.006	FRABETTI	97C	E687	γ Be, $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma(\overline{K}^*(892)^0\rho^0\pi^+)/\Gamma(\overline{K}^*(892)^0\pi^+\pi^+\pi^-)$ — Γ_{94}/Γ_{93}

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.36^{+0.24}_{-0.20}}$ **OUR FIT** Error includes scale factor of 1.8.				
0.75±0.17±0.19	ANJOS	90D	E691	Photoproduction

$\Gamma(\overline{K}^*(892)^0\pi^+\pi^+\pi^-\text{ no-}\rho)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{95}/Γ_{34}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.048±0.015±0.011	FRABETTI	97C	E687	γ Be, $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma(K^-\rho^0\pi^+\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{63}/Γ_{34}

VALUE	DOCUMENT ID		TECN	COMMENT
0.034±0.009±0.005	FRABETTI	97C	E687	γ Be, $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma(K^-\pi^+\pi^+\pi^+\pi^-\text{ nonresonant})/\Gamma(K^-\pi^+\pi^+)$ — Γ_{64}/Γ_{34}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.026	90	FRABETTI	97C	E687	γ Be, $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma(K^-\pi^+\pi^+\pi^0\pi^0)/\Gamma_{\text{total}}$ — Γ_{65}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.022^{+0.047}_{-0.008}\pm0.004}$	1	[47] AGUILAR-...	87F	HYBR	πp, $p p$ 360, 400 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.015		[47] BARLAG	92C	ACCM	π^- Cu 230 GeV

[47] AGUILAR-BENITEZ 87F and BARLAG 92C compute the branching fraction by topological normalization.

$\Gamma(\overline{K}^0\pi^+\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$ — Γ_{66}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.054^{+0.030}_{-0.014}}$ **OUR AVERAGE**					
$0.099^{+0.036}_{-0.070}$		[48] BARLAG	92C	ACCM	π^- Cu 230 GeV
$0.044^{+0.052}_{-0.013}\pm0.007$	2	[48] AGUILAR-...	87F	HYBR	πp, $p p$ 360, 400 GeV

[48] AGUILAR-BENITEZ 87F and BARLAG 92C compute the branching fraction by topological normalization.

$\Gamma(\overline{K}^0 \pi^+ \pi^+ \pi^+ \pi^- \pi^-)/\Gamma_{total}$ — Γ_{67}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.0008±0.0007	[49] BARLAG	92C	ACCM	π^- Cu 230 GeV

[49] BARLAG 92C computes the branching fraction using topological normalization.

$\Gamma(K^- \pi^+ \pi^+ \pi^+ \pi^- \pi^0)/\Gamma_{total}$ — Γ_{68}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.0020±0.0018	[50] BARLAG	92C	ACCM	π^- Cu 230 GeV

[50] BARLAG 92C computes the branching fraction using topological normalization.

$\Gamma(\overline{K}^0 \overline{K}^0 K^+)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{69}/Γ_{34}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.20±0.09 OUR AVERAGE Error includes scale factor of 2.4.					
0.14±0.04±0.02	39	ALBRECHT	94I	ARG	$e^+ e^- \approx 10$ GeV
0.34±0.07	70	AMMAR	91	CLEO	$e^+ e^- \approx 10.5$ GeV

Pionic modes

$\Gamma(\pi^+ \pi^0)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{97}/Γ_{34}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.028±0.006±0.005	34	SELEN	93	CLE2	$e^+ e^- \approx \Upsilon(4S)$

$\Gamma(\pi^+ \pi^+ \pi^-)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{98}/Γ_{34}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0406±0.0034 OUR FIT					
0.0403±0.0035 OUR AVERAGE					
0.043 ±0.003 ±0.003	236	FRABETTI	97D	E687	γ Be ≈ 200 GeV
0.032 ±0.011 ±0.003	20	ADAMOVICH	93	WA82	π^- 340 GeV
0.035 ±0.007 ±0.003		ANJOS	89	E691	Photoproduction
0.042 ±0.016 ±0.010	57	BALTRUSAIT...	85E	MRK3	$e^+ e^-$ 3.77 GeV

$\Gamma(\rho^0 \pi^+)/\Gamma(\pi^+ \pi^+ \pi^-)$ — Γ_{99}/Γ_{98}

VALUE	DOCUMENT ID		TECN	COMMENT
0.289±0.055±0.058	[51] FRABETTI	97D	E687	γ Be ≈ 200 GeV

[51] FRABETTI 97D also includes $f_2(1270)\pi^+$ and $f_0(980)\pi^+$ modes in the fit, but the resulting decay fractions are not statistically significant.

$\Gamma(\rho^0 \pi^+)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{99}/Γ_{34}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.015	90	ANJOS	89	E691	Photoproduction

$\Gamma(\pi^+ \pi^+ \pi^- \text{ nonresonant})/\Gamma(\pi^+ \pi^+ \pi^-)$ — Γ_{100}/Γ_{98}

VALUE	DOCUMENT ID		TECN	COMMENT
0.62 ±0.11 OUR FIT				
0.589±0.105±0.081	[52] FRABETTI	97D	E687	γ Be ≈ 200 GeV

[52] FRABETTI 97D also includes $f_2(1270)\pi^+$ and $f_0(980)\pi^+$ modes in the fit, but the resulting decay fractions are not statistically significant.

$\Gamma(\pi^+\pi^+\pi^-$ nonresonant$)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{100}/Γ_{34}

VALUE	DOCUMENT ID		TECN	COMMENT
0.025±0.005 OUR FIT				
0.027±0.007±0.002	ANJOS	89	E691	Photoproduction

$\Gamma(\pi^+\pi^+\pi^-\pi^0)/\Gamma_{total}$ — Γ_{101}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.019^{+0.015}_{-0.012}}$	[53] BARLAG	92C	ACCM	π^- Cu 230 GeV

[53] BARLAG 92C computes the branching fraction using topological normalization.

$\Gamma(\pi^+\pi^+\pi^-\pi^0)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{101}/Γ_{34}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.4	90	ANJOS	89E	E691	Photoproduction

$\Gamma(\eta\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{106}/Γ_{34}

Unseen decay modes of the η are included.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.083±0.023±0.014		99	DAOUDI	92	CLE2	$e^+e^- \approx$ 10.5 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.12	90		ANJOS	89E	E691	Photoproduction

$\Gamma(\omega\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{108}/Γ_{34}

Unseen decay modes of the ω are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.08	90	ANJOS	89E	E691	Photoproduction

$\Gamma(\pi^+\pi^+\pi^+\pi^-\pi^-)/\Gamma_{total}$ — Γ_{104}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.0010^{+0.0008}_{-0.0007}$	[54] BARLAG	92C	ACCM	π^- Cu 230 GeV

[54] BARLAG 92C computes the branching fraction using topological normalization.

$\Gamma(\pi^+\pi^+\pi^+\pi^-\pi^-)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{104}/Γ_{34}

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.023±0.004±0.002		58	FRABETTI	97C	E687	γ Be, $\overline{E}_\gamma \approx$ 200 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.019	90		ANJOS	89	E691	Photoproduction

$\Gamma(\eta\rho^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{109}/Γ_{34}

Unseen decay modes of the η are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.13	90	DAOUDI	92	CLE2	$e^+e^- \approx$ 10.5 GeV

$\Gamma(\pi^+\pi^+\pi^+\pi^-\pi^-\pi^0)/\Gamma_{total}$ — Γ_{105}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$0.0029^{+0.0029}_{-0.0020}$	[55] BARLAG	92C	ACCM	π^- Cu 230 GeV

[55] BARLAG 92C computes the branching fraction using topological normalization.

$\Gamma(\eta'(958)\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{110}/Γ_{34}

Unseen decay modes of the $\eta'(958)$ are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.1	90	DAOUDI	92	CLE2	$e^+e^- \approx$ 10.5 GeV
<0.1	90	ALVAREZ	91	NA14	Photoproduction
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.13	90	ANJOS	91B	E691	γ Be, $\overline{E}_\gamma \approx$ 145 GeV

$\Gamma(\eta'(958)\rho^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{111}/Γ_{34}

Unseen decay modes of the $\eta'(958)$ are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.17	90	DAOUDI	92	CLE2	$e^+e^- \approx$ 10.5 GeV

Hadronic modes with a $K\overline{K}$ pair

$\Gamma(K^+\overline{K}^0)/\Gamma(\overline{K}^0\pi^+)$ — Γ_{112}/Γ_{33}

It is generally assumed for modes such as $D^+ \to \overline{K}^0\pi^+$ that

$$\Gamma(D^+ \to \overline{K}^0\pi^+) = 2\Gamma(D^+ \to K^0_S\pi^+);$$

it is the latter Γ that is actually measured. BIGI 95 points out that interference between Cabibbo-allowed and doubly Cabibbo-suppressed amplitudes, where both occur, could invalidate this assumption by a few percent.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.255±0.029 OUR FIT					
0.263±0.035 OUR AVERAGE					
0.25 ±0.04 ±0.02	129	FRABETTI	95	E687	γ Be $\overline{E}_\gamma \approx$ 200 GeV
0.271±0.065±0.039	69	ANJOS	90C	E691	γ Be
0.317±0.086±0.048	31	BALTRUSAIT...	85E	MRK3	e^+e^- 3.77 GeV
0.25 ±0.15	6	SCHINDLER	81	MRK2	e^+e^- 3.771 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.222±0.041±0.029	70	[56] BISHAI	97	CLE2	$e^+e^- \approx \Upsilon(4S)$

[56] This BISHAI 97 result is redundant with results elsewhere in the Listings.

$\Gamma(K^+\overline{K}^0)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{112}/Γ_{34}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.082±0.010 OUR FIT					
0.077±0.014±0.007	70	[57] BISHAI	97	CLE2	$e^+e^- \approx \Upsilon(4S)$

[57] See BISHAI 97 for an isospin analysis of $D^+ \to K\overline{K}$ amplitudes.

$\Gamma(K^+K^-\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{113}/Γ_{34}

VALUE	DOCUMENT ID		TECN	COMMENT
0.0976±0.0042±0.0046	FRABETTI	95B	E687	Dalitz plot analysis

$\Gamma(\phi\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{130}/Γ_{34}

Unseen decay modes of the ϕ are included.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.068±0.005 OUR AVERAGE					
0.058±0.006±0.006		FRABETTI	95B	E687	Dalitz plot analysis
0.062±0.017±0.006	19	ADAMOVICH	93	WA82	π^- 340 GeV
0.077±0.011±0.005	128	DAOUDI	92	CLE2	$e^+e^- \approx$ 10.5 GeV
0.098±0.032±0.014	12	ALVAREZ	90C	NA14	Photoproduction
0.071±0.008±0.007	84	ANJOS	88	E691	Photoproduction
0.084±0.021±0.011	21	BALTRUSAIT...	85E	MRK3	e^+e^- 3.77 GeV

$\Gamma(K^+\overline{K}^*(892)^0)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{134}/Γ_{34}

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.047±0.005 OUR AVERAGE	Error includes scale factor of 1.2.				
0.044±0.003±0.004		[58] FRABETTI	95B	E687	Dalitz plot analysis
0.058±0.009±0.006	73	ANJOS	88	E691	Photoproduction
0.048±0.021±0.011	14	BALTRUSAIT...	85E	MRK3	e^+e^- 3.77 GeV

[58] See FRABETTI 95B for evidence also of $\overline{K}^*_0(1430)^0 K^+$ in the $D^+ \to K^+K^-\pi^+$ Dalitz plot.

$\Gamma(K^+K^-\pi^+ \text{ nonresonant})/\Gamma(K^-\pi^+\pi^+)$ — Γ_{116}/Γ_{34}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.050±0.009 OUR AVERAGE					
0.049±0.008±0.006	95	ANJOS	88	E691	Photoproduction
0.059±0.026±0.009	37	BALTRUSAIT...	85E	MRK3	e^+e^- 3.77 GeV

$\Gamma(K^*(892)^+\overline{K}^0)/\Gamma(\overline{K}^0\pi^+)$ — Γ_{135}/Γ_{33}

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.1±0.3±0.4	67	FRABETTI	95	E687	γ Be $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma(\phi\pi^+\pi^0)/\Gamma_{total}$ — Γ_{131}/Γ

Unseen decay modes of the ϕ are included.

VALUE	DOCUMENT ID		TECN	COMMENT
0.023±0.010	[59] BARLAG	92C	ACCM	π^- Cu 230 GeV

[59] BARLAG 92C computes the branching fraction using topological normalization.

$\Gamma(\phi\pi^+\pi^0)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{131}/Γ_{34}

Unseen decay modes of the ϕ are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.58	90	ALVAREZ	90C	NA14	Photoproduction
<0.28	90	ANJOS	89E	E691	Photoproduction

$\Gamma(\phi\rho^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{132}/Γ_{34}

Unseen decay modes of the ϕ are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.16	90	DAOUDI	92	CLE2	$e^+e^- \approx$ 10.5 GeV

$\Gamma(K^+ K^- \pi^+ \pi^0 \text{ non-}\phi)/\Gamma_{total}$ — Γ_{122}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$0.015^{+0.007}_{-0.006}$	[60] BARLAG	92C	ACCM	π^- Cu 230 GeV

[60] BARLAG 92C computes the branching fraction using topological normalization.

$\Gamma(K^+ K^- \pi^+ \pi^0 \text{ non-}\phi)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{122}/Γ_{34}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.25	90	ANJOS	89E	E691	Photoproduction

$\Gamma(K^+ \overline{K}^0 \pi^+ \pi^-)/\Gamma_{total}$ — Γ_{123}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.02	90	ALBRECHT	92B	ARG	$e^+ e^- \simeq$ 10.4 GeV

$\Gamma(K^0 K^- \pi^+ \pi^+)/\Gamma_{total}$ — Γ_{124}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.01 ±0.005±0.003	ALBRECHT	92B	ARG	$e^+ e^- \simeq$ 10.4 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.003	[61] BARLAG	92C	ACCM	π^- Cu 230 GeV

[61] BARLAG 92C computes the branching fraction using topological normalization.

$\Gamma(K^*(892)^+ \overline{K}^*(892)^0)/\Gamma_{total}$ — Γ_{136}/Γ

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.026±0.008±0.007	ALBRECHT	92B	ARG	$e^+ e^- \simeq$ 10.4 GeV

$\Gamma(K^0 K^- \pi^+ \pi^+ \text{ non-}K^{*+} \overline{K}^{*0})/\Gamma_{total}$ — Γ_{126}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0079	90	ALBRECHT	92B	ARG	$e^+ e^- \simeq$ 10.4 GeV

$\Gamma(\phi \pi^+ \pi^+ \pi^-)/\Gamma_{total}$ — Γ_{133}/Γ

Unseen decay modes of the ϕ are included.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<0.002	90	0	ANJOS	88	E691	Photoproduction

$\Gamma(\phi \pi^+ \pi^+ \pi^-)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{133}/Γ_{34}

Unseen decay modes of the ϕ are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.031	90	ALVAREZ	90C	NA14	Photoproduction

$\Gamma(\phi \pi^+ \pi^+ \pi^-)/\Gamma(\phi \pi^+)$ — $\Gamma_{133}/\Gamma_{130}$

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.6	90	FRABETTI	92	E687	γ Be

$\Gamma(K^+K^-\pi^+\pi^+\pi^-$ nonresonant$)/\Gamma_{total}$ — Γ_{129}/Γ

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<0.03	90	12	ANJOS	88	E691	Photoproduction

Rare or forbidden modes

$\Gamma(K^+\pi^+\pi^-)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{137}/Γ_{34}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0075±0.0016 OUR AVERAGE					
0.0077±0.0017±0.0008	59	AITALA	97C	E791	π^- nucleus, 500 GeV
0.0072±0.0023±0.0017	21	FRABETTI	95E	E687	γBe, $\overline{E}_\gamma$= 220 GeV

$\Gamma(K^+\rho^0)/\Gamma(K^+\pi^+\pi^-)$ — $\Gamma_{138}/\Gamma_{137}$

VALUE	DOCUMENT ID		TECN	COMMENT
0.37±0.14±0.07	AITALA	97C	E791	π^- nucleus, 500 GeV

$\Gamma(K^+\rho^0)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{138}/Γ_{34}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0067	90	FRABETTI	95E	E687	γBe, $\overline{E}_\gamma$= 220 GeV

$\Gamma(K^*(892)^0\pi^+)/\Gamma(K^+\pi^+\pi^-)$ — $\Gamma_{139}/\Gamma_{137}$

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.53±0.21±0.02	AITALA	97C	E791	π^- nucleus, 500 GeV

$\Gamma(K^*(892)^0\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{139}/Γ_{34}

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0021	90	FRABETTI	95E	E687	γBe, $\overline{E}_\gamma$= 220 GeV

$\Gamma(K^+\pi^+\pi^-$ nonresonant$)/\Gamma(K^+\pi^+\pi^-)$ — $\Gamma_{140}/\Gamma_{137}$

VALUE	DOCUMENT ID		TECN	COMMENT
0.36±0.14±0.07	AITALA	97C	E791	π^- nucleus, 500 GeV

$\Gamma(K^+K^+K^-)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{141}/Γ_{34}

A doubly Cabibbo-suppressed decay with no simple spectator process possible.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<0.0016	90		[62] FRABETTI	95F	E687	γBe, $\overline{E}_\gamma\approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
0.057 ±0.020±0.007		13	ADAMOVICH	93	WA82	π^- 340 GeV

[62] Using the $\phi\pi^+$ mode to normalize, FRABETTI 95F gets $\Gamma(K^+K^+K^-)/\Gamma(\phi\pi^+) <$ 0.025.

$\Gamma(\phi K^+)/\Gamma(\phi\pi^+)$ — $\Gamma_{142}/\Gamma_{130}$

A doubly Cabibbo-suppressed decay with no simple spectator process possible.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<0.021	90		FRABETTI	95F	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$0.058^{+0.032}_{-0.026} \pm 0.007$		4	[63] ANJOS	92D	E691	γ Be, $\overline{E}_\gamma$ = 145 GeV

[63] The evidence of ANJOS 92D is a small excess of events ($4.5^{+2.4}_{-2.0}$).

$\Gamma(\pi^+ e^+ e^-)/\Gamma_{total}$ — Γ_{143}/Γ

A test for the $\Delta C = 1$ weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<6.6 × 10^{-5}	90		AITALA	96	E791	π^- N 500 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<1.1 \times 10^{-4}$	90		FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
$<2.5 \times 10^{-3}$	90		WEIR	90B	MRK2	e^+e^- 29 GeV
$<2.6 \times 10^{-3}$	90	39	HAAS	88	CLEO	e^+e^- 10 GeV

$\Gamma(\pi^+ \mu^+ \mu^-)/\Gamma_{total}$ — Γ_{144}/Γ

A test for the $\Delta C = 1$ weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<1.8 × 10^{-5}	90		AITALA	96	E791	π^- N 500 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<8.9 \times 10^{-5}$	90		FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
$<2.2 \times 10^{-4}$	90	0	KODAMA	95	E653	π^- emulsion 600 GeV
$<5.9 \times 10^{-3}$	90		WEIR	90B	MRK2	e^+e^- 29 GeV
$<2.9 \times 10^{-3}$	90	36	HAAS	88	CLEO	e^+e^- 10 GeV

$\Gamma(\rho^+ \mu^+ \mu^-)/\Gamma_{total}$ — Γ_{145}/Γ

A test for the $\Delta C = 1$ weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<5.6 × 10^{-4}	90	0	KODAMA	95	E653	π^- emulsion 600 GeV

$\Gamma(K^+ e^+ e^-)/\Gamma_{total}$ — Γ_{146}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<2.0 × 10^{-4}	90	FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<4.8 \times 10^{-3}$	90	WEIR	90B	MRK2	e^+e^- 29 GeV

$\Gamma(K^+ \mu^+ \mu^-)/\Gamma_{total}$ — Γ_{147}/Γ

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<9.7 × 10^{-5}	90		FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<3.2 \times 10^{-4}$	90	0	KODAMA	95	E653	π^- emulsion 600 GeV
$<9.2 \times 10^{-3}$	90		WEIR	90B	MRK2	e^+e^- 29 GeV

$\Gamma(\pi^+ e^+ \mu^-)/\Gamma_{total}$ Γ_{148}/Γ

A test of lepton-family-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.1 × 10^{-4}	90	FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3.3 \times 10^{-3}$	90	WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

$\Gamma(\pi^+ e^- \mu^+)/\Gamma_{total}$ Γ_{149}/Γ

A test of lepton-family-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.3 × 10^{-4}	90	FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3.3 \times 10^{-3}$	90	WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

$\Gamma(K^+ e^+ \mu^-)/\Gamma_{total}$ Γ_{150}/Γ

A test of lepton-family-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.3 × 10^{-4}	90	FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3.4 \times 10^{-3}$	90	WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

$\Gamma(K^+ e^- \mu^+)/\Gamma_{total}$ Γ_{151}/Γ

A test of lepton-family-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.2 × 10^{-4}	90	FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3.4 \times 10^{-3}$	90	WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

$\Gamma(\pi^- e^+ e^+)/\Gamma_{total}$ Γ_{152}/Γ

A test of lepton-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.1 × 10^{-4}	90	FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<4.8 \times 10^{-3}$	90	WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

$\Gamma(\pi^- \mu^+ \mu^+)/\Gamma_{total}$ Γ_{153}/Γ

A test of lepton-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<8.7 × 10^{-5}	90		FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<2.2 \times 10^{-4}$	90	0	KODAMA	95	E653	π^- emulsion 600 GeV
$<6.8 \times 10^{-3}$	90		WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

$\Gamma(\pi^- e^+ \mu^+)/\Gamma_{total}$ Γ_{154}/Γ

A test of lepton-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.1 × 10^{-4}	90	FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3.7 \times 10^{-3}$	90	WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

$\Gamma(\rho^-\mu^+\mu^+)/\Gamma_{total}$ Γ_{155}/Γ

A test of lepton-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<5.6 × 10^−4	90	0	KODAMA	95	E653	π^- emulsion 600 GeV

$\Gamma(K^-e^+e^+)/\Gamma_{total}$ Γ_{156}/Γ

A test of lepton-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.2 × 10^−4	90	FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<9.1 \times 10^{-3}$	90	WEIR	90B	MRK2	e^+e^- 29 GeV

$\Gamma(K^-\mu^+\mu^+)/\Gamma_{total}$ Γ_{157}/Γ

A test of lepton-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<1.2 × 10^−4	90		FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<3.2 \times 10^{-4}$	90	0	KODAMA	95	E653	π^- emulsion 600 GeV
$<4.3 \times 10^{-3}$	90		WEIR	90B	MRK2	e^+e^- 29 GeV

$\Gamma(K^-e^+\mu^+)/\Gamma_{total}$ Γ_{158}/Γ

A test of lepton-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.3 × 10^−4	90	FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<4.0 \times 10^{-3}$	90	WEIR	90B	MRK2	e^+e^- 29 GeV

$\Gamma(K^*(892)^-\mu^+\mu^+)/\Gamma_{total}$ Γ_{159}/Γ

A test of lepton-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<8.5 × 10^−4	90	0	KODAMA	95	E653	π^- emulsion 600 GeV

$D^\pm$ CP-VIOLATING DECAY-RATE ASYMMETRIES

$A_{CP}(K^+K^-\pi^\pm)$ in $D^\pm \to K^+K^-\pi^\pm$

This is the difference between D^+ and D^- partial widths for these modes divided by the sum of the widths.

VALUE	DOCUMENT ID		TECN	COMMENT
−0.017±0.027 OUR AVERAGE				
−0.014±0.029	[64] AITALA	97B	E791	$-0.062 < A_{CP} < +0.034$ (90% CL)
−0.031±0.068	[64] FRABETTI	94I	E687	$-0.14 < A_{CP} < +0.081$ (90% CL)

[64] FRABETTI 94I and AITALA 97B measure $N(D^+ \to K^-K^+\pi^+)/N(D^+ \to K^-\pi^+\pi^+)$, the ratio of numbers of events observed, and similarly for the D^-.

$A_{CP}(K^{\pm} K^{*0})$ in $D^+ \to K^+ \overline{K}^{*0}$ and $D^- \to K^- K^{*0}$

This is the difference between D^+ and D^- partial widths for these modes divided by the sum of the widths.

VALUE	DOCUMENT ID		TECN	COMMENT
−0.02 ±0.05 OUR AVERAGE				
−0.010±0.050	[65] AITALA	97B	E791	$-0.092 < A_{CP} < +0.072$ (90% CL)
−0.12 ±0.13	[65] FRABETTI	94I	E687	$-0.33 < A_{CP} < +0.094$ (90% CL)

[65] FRABETTI 94I and AITALA 97B measure $N(D^+ \to K^+ \overline{K}^*(892)^0)/N(D^+ \to K^- \pi^+ \pi^+)$, the ratio of numbers of events observed, and similarly for the D^-.

$A_{CP}(\phi\pi^{\pm})$ in $D^{\pm} \to \phi\pi^{\pm}$

This is the difference between D^+ and D^- partial widths for these modes divided by the sum of the widths.

VALUE	DOCUMENT ID		TECN	COMMENT
−0.014±0.033 OUR AVERAGE				
−0.028±0.036	[66] AITALA	97B	E791	$-0.087 < A_{CP} < +0.031$ (90% CL)
+0.066±0.086	[66] FRABETTI	94I	E687	$-0.075 < A_{CP} < +0.21$ (90% CL)

[66] FRABETTI 94I and AITALA 97B measure $N(D^+ \to \phi\pi^+)/N(D^+ \to K^- \pi^+ \pi^+)$, the ratio of numbers of events observed, and similarly for the D^-.

$A_{CP}(\pi^+\pi^-\pi^{\pm})$ in $D^{\pm} \to \pi^+\pi^-\pi^{\pm}$

This is the difference between D^+ and D^- partial widths for these modes divided by the sum of the widths.

VALUE	DOCUMENT ID		TECN	COMMENT
−0.017±0.042	[67] AITALA	97B	E791	$-0.086 < A_{CP} < +0.052$ (90% CL)

[67] AITALA 97B measure $N(D^+ \to \pi^+\pi^-\pi^+)/N(D^+ \to K^- \pi^+ \pi^+)$, the ratio of numbers of events observed, and similarly for the D^-.

$D^{\pm}$ PRODUCTION CROSS SECTION AT $\psi(3770)$

A compilation of the cross sections for the direct production of $D^{\pm}$ mesons at or near the $\psi(3770)$ peak in e^+e^- production.

VALUE (nanobarns)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
4.2 ±0.6 ±0.3	[68] ADLER	88C	MRK3	e^+e^- 3.768 GeV
5.5 ±1.0	[69] PARTRIDGE	84	CBAL	e^+e^- 3.771 GeV
6.00±0.72±1.02	[70] SCHINDLER	80	MRK2	e^+e^- 3.771 GeV
9.1 ±2.0	[71] PERUZZI	77	MRK1	e^+e^- 3.774 GeV

[68] This measurement compares events with one detected D to those with two detected D mesons, to determine the the absolute cross section. ADLER 88C measure the ratio of cross sections (neutral to charged) to be 1.36 ± 0.23 ± 0.14. This measurement does not include the decays of the $\psi(3770)$ not associated with charmed particle production.

[69] This measurement comes from a scan of the $\psi(3770)$ resonance and a fit to the cross section. PARTRIDGE 84 measures 6.4 ± 1.15 nb for the cross section. We take the phase space division of neutral and charged D mesons in $\psi(3770)$ decay to be 1.33, and we assume that the $\psi(3770)$ is an isosinglet to evaluate the cross sections. The noncharm decays (e.g. radiative) of the $\psi(3770)$ are included in this measurement and may amount to a few percent correction.

[70] This measurement comes from a scan of the $\psi(3770)$ resonance and a fit to the cross section. SCHINDLER 80 assume the phase space division of neutral and charged D

mesons in $\psi(3770)$ decay to be 1.33, and that the $\psi(3770)$ is an isosinglet. The noncharm decays (e.g. radiative) of the $\psi(3770)$ are included in this measurement and may amount to a few percent correction.

[71] This measurement comes from a scan of the $\psi(3770)$ resonance and a fit to the cross section. The phase space division of neutral and charged D mesons in $\psi(3770)$ decay is taken to be 1.33, and $\psi(3770)$ is assumed to be an isosinglet. The noncharm decays (e.g. radiative) of the $\psi(3770)$ are included in this measurement and may amount to a few percent correction. We exclude this measurement from the average because of uncertainties in the contamination from τ lepton pairs. Also see RAPIDIS 77.

$D^+ \to \overline{K}^*(892)^0 \ell^+ \nu_\ell$ FORM FACTORS

$r_2 \equiv A_2(0)/A_1(0)$ in $D^+ \to \overline{K}^*(892)^0 \ell^+ \nu_\ell$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.72±0.09 OUR AVERAGE					
0.71±0.08±0.09	3000	[72] AITALA	98B	E791	π^- nucleus, 500 GeV
0.78±0.18±0.10	874	[73] FRABETTI	93E	E687	γ Be, 220 GeV
$0.82^{+0.22}_{-0.23}\pm0.11$	305	[73] KODAMA	92	E653	$\pi^- N$, 600 GeV
0.0 ±0.5 ±0.2	183	[72] ANJOS	90E	E691	γ Be, 90–260 GeV

[72] AITALA 98B and ANJOS 90E use $D^+ \to \overline{K}^*(892)^0 e^+ \nu_e$ decays.

[73] FRABETTI 93E and KODAMA 92 use $D^+ \to \overline{K}^*(892)^0 \mu^+ \nu_\mu$ decays.

$r_v \equiv V(0)/A_1(0)$ in $D^+ \to \overline{K}^*(892)^0 \ell^+ \nu_\ell$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.85±0.12 OUR AVERAGE					
1.84±0.11±0.08	3000	[74] AITALA	98B	E791	π^- nucleus, 500 GeV
1.74±0.27±0.28	874	[75] FRABETTI	93E	E687	γ Be, 220 GeV
$2.00^{+0.34}_{-0.32}\pm0.16$	305	[75] KODAMA	92	E653	$\pi^- N$, 600 GeV
2.0 ±0.6 ±0.3	183	[74] ANJOS	90E	E691	γ Be, 90–260 GeV

[74] AITALA 98B and ANJOS 90E use $D^+ \to \overline{K}^*(892)^0 e^+ \nu_e$ decays.

[75] FRABETTI 93E and KODAMA 92 use $D^+ \to \overline{K}^*(892)^0 \mu^+ \nu_\mu$ decays.

Γ_L/Γ_T in $D^+ \to \overline{K}^*(892)^0 \ell^+ \nu_\ell$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.23±0.13 OUR AVERAGE					
1.20±0.13±0.13	874	[76] FRABETTI	93E	E687	γ Be, 220 GeV
1.18±0.18±0.08	305	[76] KODAMA	92	E653	$\pi^- N$, 600 GeV
$1.8\ ^{+0.6}_{-0.4}\ \pm0.3$	183	[77] ANJOS	90E	E691	γ Be, 90–260 GeV

[76] FRABETTI 93E and KODAMA 92 use $D^+ \to \overline{K}^*(892)^0 \mu^+ \nu_\mu$ decays. Γ_L/Γ_T is evaluated for a lepton mass of zero.

[77] ANJOS 90E uses $D^+ \to \overline{K}^*(892)^0 e^+ \nu_e$ decays.

Γ_+/Γ_- in $D^+ \to \overline{K}^*(892)^0 \ell^+ \nu_\ell$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.16±0.04 OUR AVERAGE					
$0.16\pm0.05\pm0.02$	305	[78] KODAMA	92	E653	$\pi^- N$, 600 GeV
$0.15^{+0.07}_{-0.05}\pm0.03$	183	[79] ANJOS	90E	E691	γBe, 90–260 GeV

[78] KODAMA 92 uses $D^+ \to \overline{K}^*(892)^0 \mu^+ \nu_\mu$ decays. Γ_+/Γ_- is evaluated for a lepton mass of zero.
[79] ANJOS 90E uses $D^+ \to \overline{K}^*(892)^0 e^+ \nu_e$ decays.

$D^\pm$ REFERENCES

AITALA	98B	PRL 80 1393	+Amato, Anjos, Appel+	(FNAL E791 Collab.)
PDG	98	EPJ C3 1	C. Caso+	
AITALA	97	PL B397 325	+Amato, Anjos, Appel+	(FNAL E791 Collab.)
AITALA	97B	PL B403 377	+Amato, Anjos, Appel+	(FNAL E791 Collab.)
AITALA	97C	PL B404 187	+Amato, Anjos, Appel+	(FNAL E791 Collab.)
BARTELT	97	PL B405 373	+Csorna, Jain, Marka+	(CLEO Collab.)
BISHAI	97	PRL 78 3261	+Fast, Gerndt, Hinson+	(CLEO Collab.)
FRABETTI	97	PL B391 235	+Cheung, Cumalat+	(FNAL E687 Collab.)
FRABETTI	97B	PL B398 239	+Cheung, Cumalat+	(FNAL E687 Collab.)
FRABETTI	97C	PL B401 131	+Cheung, Cumalat+	(FNAL E687 Collab.)
FRABETTI	97D	PL B407 79	+Cheung, Cumalat+	(FNAL E687 Collab.)
AITALA	96	PRL 76 364	+Amato, Anjos+	(FNAL E791 Collab.)
ALBRECHT	96C	PL B374 249	+Hamacher, Hofmann+	(ARGUS Collab.)
BIGI	95	PL B349 363	+Yamamoto	(NDAM, HARV)
FRABETTI	95	PL B346 199	+Cheung, Cumalat+	(FNAL E687 Collab.)
FRABETTI	95B	PL B351 591	+Cheung, Cumalat+	(FNAL E687 Collab.)
FRABETTI	95E	PL B359 403	+Cheung, Cumalat+	(FNAL E687 Collab.)
FRABETTI	95F	PL B363 259	+Cheung, Cumalat+	(FNAL E687 Collab.)
KODAMA	95	PL B345 85	+Ushida, Mokhtarani+	(FNAL E653 Collab.)
ALBRECHT	94I	ZPHY C64 375	+Hamacher, Hofmann+	(ARGUS Collab.)
ALEEV	94	PAN 57 1370	+Balandin+	(Serpukhov BIS-2 Collab.)
		Translated from YF 57 1443.		
BALEST	94	PRL 72 2328	+Cho, Daoudi, Ford+	(CLEO Collab.)
FRABETTI	94D	PL B323 459	+Cheung, Cumalat+	(FNAL E687 Collab.)
FRABETTI	94G	PL B331 217	+Cheung, Cumalat+	(FNAL E687 Collab.)
FRABETTI	94I	PR D50 R2953	+Cheung, Cumalat+	(FNAL E687 Collab.)
ABE	93E	PL B313 288	+Amako, Arai, Arima, Asano+	(VENUS Collab.)
ADAMOVICH	93	PL B305 177	+Alexandrov, Antinori+	(CERN WA82 Collab.)
AKERIB	93	PRL 71 3070	+Barish, Chadha, Chan+	(CLEO Collab.)
ALAM	93	PRL 71 1311	+Kim, Nemati, O'Neill+	(CLEO Collab.)
ANJOS	93	PR D48 56	+Appel, Bean, Bracker+	(FNAL E691 Collab.)
BEAN	93C	PL B317 647	+Gronberg, Kutschke, Menary+	(CLEO Collab.)
FRABETTI	93E	PL B307 262	+Grim, Paolone, Yager+	(FNAL E687 Collab.)
KODAMA	93B	PL B313 260	+Ushida, Mokhtarani+	(FNAL E653 Collab.)
KODAMA	93C	PL B316 455	+Ushida, Mokhtarani+	(FNAL E653 Collab.)
SELEN	93	PRL 71 1973	+Sadoff, Ammar, Ball+	(CLEO Collab.)
ALBRECHT	92B	ZPHY C53 361	+Ehrlichmann, Hamacher, Krueger+	(ARGUS Collab.)
ALBRECHT	92F	PL B278 202	+Ehrlichmann, Hamacher+	(ARGUS Collab.)
ANJOS	92	PR D45 R2177	+Appel, Bean, Bracker+	(FNAL E691 Collab.)
ANJOS	92C	PR D46 1941	+Appel, Bean, Bracker+	(FNAL E691 Collab.)
ANJOS	92D	PRL 69 2892	+Appel, Bean, Bediaga+	(FNAL E691 Collab.)
BARLAG	92C	ZPHY C55 383	+Becker, Bozek, Boehringer+	(ACCMOR Collab.)
Also	90D	ZPHY C48 29	Barlag, Becker, Boehringer, Bosman+	(ACCMOR Collab.)
COFFMAN	92B	PR D45 2196	+DeJongh, Dubois, Eigen+	(Mark III Collab.)
DAOUDI	92	PR D45 3965	+Ford, Johnson, Lingel+	(CLEO Collab.)
FRABETTI	92	PL B281 167	+Bogart, Cheung, Culy+	(FNAL E687 Collab.)
KODAMA	92	PL B274 246	+Ushida, Mokhtarani+	(FNAL E653 Collab.)
KODAMA	92C	PL B286 187	+Ushida, Mokhtarani+	(FNAL E653 Collab.)
ADAMOVICH	91	PL B268 142	+Alexandrov, Antinori, Barberis+	(WA82 Collab.)
ALBRECHT	91	PL B255 634	+Ehrlichmann, Hamacher, Krueger+	(ARGUS Collab.)
ALVAREZ	91	PL B255 639	+Barate, Bloch, Bonamy+	(CERN NA14/2 Collab.)
ALVAREZ	91B	ZPHY C50 11	+Barate, Bloch, Bonamy+	(CERN NA14/2 Collab.)
AMMAR	91	PR D44 3383	+Baringer, Coppage, Davis+	(CLEO Collab.)
ANJOS	91B	PR D43 R2063	+Appel, Bean, Bracker+	(FNAL E691 Collab.)
ANJOS	91C	PRL 67 1507	+Appel, Bean, Bracker+	(FNAL-TPS Collab.)

BAI	91	PRL 66 1011	+Bolton, Brown, Bunnell+	(Mark III Collab.)
COFFMAN	91	PL B263 135	+DeJongh, Dubois, Eigen, Hitlin+	(Mark III Collab.)
FRABETTI	91	PL B263 584	+Bogart, Cheung, Culy+	(FNAL E687 Collab.)
ALVAREZ	90	ZPHY C47 539	+Barate, Bloch, Bonamy+	(CERN NA14/2 Collab.)
ALVAREZ	90C	PL B246 261	+Barate, Bloch, Bonamy+	(CERN NA14/2 Collab.)
ANJOS	90C	PR D41 2705	+Appel, Bean+	(FNAL E691 Collab.)
ANJOS	90D	PR D42 2414	+Appel, Bean, Bracker+	(FNAL E691 Collab.)
ANJOS	90E	PRL 65 2630	+Appel, Bean, Bracker+	(FNAL E691 Collab.)
BARLAG	90C	ZPHY C46 563	+Becker, Boehringer, Bosman+	(ACCMOR Collab.)
WEIR	90B	PR D41 1384	+Klein, Abrams, Adolphsen, Akerlof+	(Mark II Collab.)
ANJOS	89	PRL 62 125	+Appel, Bean, Bracker+	(FNAL E691 Collab.)
ANJOS	89B	PRL 62 722	+Appel, Bean, Bracker+	(FNAL E691 Collab.)
ANJOS	89E	PL B223 267	+Appel, Bean, Bracker+	(FNAL E691 Collab.)
ADLER	88B	PRL 60 1375	+Becker, Blaylock+	(Mark III Collab.)
ADLER	88C	PRL 60 89	+Becker, Blaylock+	(Mark III Collab.)
ALBRECHT	88I	PL B210 267	+Boeckmann, Glaeser+	(ARGUS Collab.)
ANJOS	88	PRL 60 897	+Appel+	(FNAL E691 Collab.)
AOKI	88	PL B209 113	+Arnold, Baroni+	(WA75 Collab.)
HAAS	88	PRL 60 1614	+Hempstead, Jensen+	(CLEO Collab.)
ONG	88	PRL 60 2587	+Weir, Abrams, Amidei+	(Mark II Collab.)
RAAB	88	PR D37 2391	+Anjos, Appel, Bracker+	(FNAL E691 Collab.)
ADAMOVICH	87	EPL 4 887	+Alexandrov, Bolta+	(Photon Emulsion Collab.)
ADLER	87	PL B196 107	+Becker, Blaylock, Bolton+	(Mark III Collab.)
AGUILAR-...	87D	PL B193 140	Aguilar-Benitez, Allison+	(LEBC-EHS Collab.)
Also	88B	ZPHY C40 321	Aguilar-Benitez, Allison, Bailly+	(LEBC-EHS Collab.)
AGUILAR-...	87E	ZPHY C36 551	Aguilar-Benitez, Allison+	(LEBC-EHS Collab.)
Also	88B	ZPHY C40 321	Aguilar-Benitez, Allison, Bailly+	(LEBC-EHS Collab.)
AGUILAR-...	87F	ZPHY C36 559	Aguilar-Benitez, Allison+	(LEBC-EHS Collab.)
Also	88	ZPHY C38 520 erratum		
BARLAG	87B	ZPHY C37 17	+Becker, Boehringer, Bosman+	(ACCMOR Collab.)
BARTEL	87	ZPHY C33 339	+Becker, Felst, Haidt+	(JADE Collab.)
CSORNA	87	PL B191 318	+Mestayer, Panvini, Word+	(CLEO Collab.)
PALKA	87B	ZPHY C35 151	+Bailey, Becker+	(ACCMOR Collab.)
ABE	86	PR D33 1	+	(SLAC Hybrid Facility Photon Collab.)
AGUILAR-...	86B	ZPHY C31 491	Aguilar-Benitez, Allison+	(LEBC-EHS Collab.)
BALTRUSAIT...	86E	PRL 56 2140	Baltrusaitis, Becker, Blaylock, Brown+	(Mark III Collab.)
PAL	86	PR D33 2708	+Atwood, Barish, Bonneaud+	(DELCO Collab.)
AIHARA	85	ZPHY C27 39	+Alston-Garnjost, Badtke, Bakken+	(TPC Collab.)
BALTRUSAIT...	85B	PRL 54 1976	Baltrusaitis, Becker, Blaylock, Brown+	(Mark III Collab.)
BALTRUSAIT...	85E	PRL 55 150	Baltrusaitis, Becker, Blaylock, Brown+	(Mark III Collab.)
BARTEL	85J	PL 163B 277	+Becker, Cords, Felst+	(JADE Collab.)
ADAMOVICH	84	PL 140B 119	+Alexandrov, Bolta, Bravo+	(CERN WA58 Collab.)
ALTHOFF	84G	ZPHY C22 219	+Braunschweig, Kirschfink+	(TASSO Collab.)
ALTHOFF	84J	PL 146B 443	+Branschweig, Kirschfink+	(TASSO Collab.)
DERRICK	84	PRL 53 1971	+Fernandez, Fries, Hyman+	(HRS Collab.)
KOOP	84	PRL 52 970	+Sakuda, Atwood, Baillon+	(DELCO Collab.)
PARTRIDGE	84	Thesis CALT-68-1150		(Crystal Ball Collab.)
AGUILAR-...	83B	PL 123B 98	Aguilar-Benitez, Allison+	(LEBC-EHS Collab.)
AUBERT	83	NP B213 31	+Bassompierre, Becks, Best+	(EMC Collab.)
PARTRIDGE	81	PRL 47 760	+Peck, Porter, Gu+	(Crystal Ball Collab.)
SCHINDLER	81	PR D24 78	+Alam, Boyarski, Breidenbach+	(Mark II Collab.)
TRILLING	81	PRPL 75 57		(LBL, UCB) J
BACINO	80	PRL 45 329	+Ferguson+	(DELCO Collab.)
SCHINDLER	80	PR D21 2716	+Siegrist, Alam, Boyarski+	(Mark II Collab.)
ZHOLENTZ	80	PL 96B 214	+Kurdadze, Lelchuk, Mishnev+	(NOVO)
Also	81	SJNP 34 814	Zholentz, Kurdadze, Lelchuk+	(NOVO)
		Translated from YAF 34 1471.		
BACINO	79	PRL 43 1073	+Ferguson, Nodulman+	(DELCO Collab.)
BRANDELIK	79	PL 80B 412	+Braunschweig, Martyn, Sander+	(DASP Collab.)
FELLER	78	PRL 40 274	+Litke, Madaras, Ronan+	(Mark I Collab.)
VUILLEMIN	78	PRL 41 1149	+Feldman, Feller+	(Mark I Collab.)
GOLDHABER	77	PL 69B 503	+Wiss, Abrams, Alam+	(Mark I Collab.)
PERUZZI	77	PRL 39 1301	+Piccolo, Feldman+	(Mark I Collab.)
PICCOLO	77	PL 70B 260	+Peruzzi, Luth, Nguyen, Wiss, Abrams+	(Mark I Collab.)
RAPIDIS	77	PRL 39 526	+Gobbi, Luke, Barbaro-Galtieri+	(Mark I Collab.)
PERUZZI	76	PRL 37 569	+Piccolo, Feldman, Nguyen, Wiss+	(Mark I Collab.)

OTHER RELATED PAPERS

RICHMAN	95	RMP 67 893	+Burchat	(UCSB, STAN)
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