$D^{\pm}$

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

$D^{\pm}$ 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 $> 100 \times 10^{-15}$ s have been omitted from the Listings.

VALUE (10^{-15} s)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1051 ±13 OUR AVERAGE					
$1033.6 \pm 22.1 \,^{+\ 9.9}_{-12.7}$	3777	BONVICINI	99	CLE2	$e^+e^- \approx \Upsilon(4S)$
1048 ±15 ±11	9k	FRABETTI	94D	E687	$D^+ \to K^-\pi^+\pi^+$
1075 ±40 ±18	2455	FRABETTI	91	E687	γ Be, $D^+ \to K^-\pi^+\pi^+$
1030 ±80 ±60	200	ALVAREZ	90	NA14	γ, $D^+ \to K^-\pi^+\pi^+$
$1050 \,^{+77}_{-72}$	317	[2] BARLAG	90C	ACCM	π^- Cu 230 GeV
1050 ±80 ±70	363	ALBRECHT	88I	ARG	e^+e^- 10 GeV
1090 ±30 ±25	2992	RAAB	88	E691	Photoproduction

[2] BARLAG 90C estimates the systematic error to be negligible.

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	ϕ anything		< 1.8 %	CL=90%
Γ_7	ϕe^+ anything		< 1.6 %	CL=90%
Γ_8	μ^+ anything			
	Leptonic and semileptonic modes			
Γ_9	$\mu^+ \nu_\mu$		$(8 \ {}^{+17}_{-5}) \times 10^{-4}$	
Γ_{10}	$\overline{K}^0 \ell^+ \nu_\ell$	[b]	(6.7 ± 0.8) %	
Γ_{11}	$\overline{K}^0 e^+ \nu_e$		(6.6 ± 0.9) %	
Γ_{12}	$\overline{K}^0 \mu^+ \nu_\mu$		$(7.0 \ {}^{+3.0}_{-2.0})$ %	
Γ_{13}	$K^- \pi^+ e^+ \nu_e$		$(4.1 \ {}^{+0.9}_{-0.7})$ %	
Γ_{14}	$\overline{K}^*(892)^0 e^+ \nu_e$ $\times$ B($\overline{K}^{*0} \to K^- \pi^+$)		(3.2 ± 0.33) %	
Γ_{15}	$K^- \pi^+ e^+ \nu_e$ nonresonant		< 7 $\times 10^{-3}$	CL=90%
Γ_{16}	$K^- \pi^+ \mu^+ \nu_\mu$		(3.2 ± 0.4) %	S=1.1
	In the fit as $\frac{2}{3}\Gamma_{28} + \Gamma_{18}$, where $\frac{2}{3}\Gamma_{28} = \Gamma_{17}$.			
Γ_{17}	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$ $\times$ B($\overline{K}^{*0} \to K^- \pi^+$)		(3.0 ± 0.4) %	
Γ_{18}	$K^- \pi^+ \mu^+ \nu_\mu$ nonresonant		(2.7 ± 1.1) $\times 10^{-3}$	
Γ_{19}	$\overline{K}^0 \pi^+ \pi^- e^+ \nu_e$			
Γ_{20}	$K^- \pi^+ \pi^0 e^+ \nu_e$			
Γ_{21}	$(\overline{K}^*(892) \pi)^0 e^+ \nu_e$		< 1.2 %	CL=90%
Γ_{22}	$(\overline{K} \pi \pi)^0 e^+ \nu_e$ non-$\overline{K}^*(892)$		< 9 $\times 10^{-3}$	CL=90%
Γ_{23}	$K^- \pi^+ \pi^0 \mu^+ \nu_\mu$		< 1.4 $\times 10^{-3}$	CL=90%
Γ_{24}	$\pi^0 \ell^+ \nu_\ell$	[c]	(3.1 ± 1.5) $\times 10^{-3}$	
Γ_{25}	$\pi^+ \pi^- e^+ \nu_e$			
	Fractions of some of the following modes with resonances have already appeared above as submodes of particular charged-particle modes.			
Γ_{26}	$\overline{K}^*(892)^0 \ell^+ \nu_\ell$	[b]	(4.8 ± 0.4) %	
Γ_{27}	$\overline{K}^*(892)^0 e^+ \nu_e$		(4.8 ± 0.5) %	
Γ_{28}	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$		(4.5 ± 0.6) %	S=1.1

Γ_{29}	$\overline{K}_1(1270)^0\,\mu^+\,\nu_\mu$		$<$ 3.5	%	CL=95%
Γ_{30}	$\overline{K}^*(1410)^0\,\mu^+\,\nu_\mu$				
Γ_{31}	$\overline{K}_2^*(1430)^0\,\mu^+\,\nu_\mu$		$<$ 8	$\times 10^{-3}$	CL=95%
Γ_{32}	$\rho^0\,e^+\,\nu_e$		(2.2 $\pm$ 0.8)	$\times 10^{-3}$	
Γ_{33}	$\rho^0\,\mu^+\,\nu_\mu$		(2.7 $\pm$ 0.7)	$\times 10^{-3}$	
Γ_{34}	$\phi\,e^+\,\nu_e$		$<$ 2.09	%	CL=90%
Γ_{35}	$\phi\,\mu^+\,\nu_\mu$		$<$ 3.72	%	CL=90%
Γ_{36}	$\eta\,\ell^+\,\nu_\ell$		$<$ 5	$\times 10^{-3}$	CL=90%
Γ_{37}	$\eta'(958)\,\mu^+\,\nu_\mu$		$<$ 9	$\times 10^{-3}$	CL=90%

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

Γ_{38}	$\overline{K}^0\,\pi^+$		(2.77 $\pm$ 0.18)	%	
Γ_{39}	$K^-\,\pi^+\,\pi^+$	[d]	(9.1 $\pm$ 0.6)	%	
Γ_{40}	$\overline{K}^*(892)^0\,\pi^+$		(1.28 $\pm$ 0.13)	%	
	$\times$ B($\overline{K}^{*0} \rightarrow K^-\,\pi^+$)				
Γ_{41}	$\overline{K}_0^*(1430)^0\,\pi^+$		(2.3 $\pm$ 0.3)	%	
	$\times$ B($\overline{K}_0^*(1430)^0 \rightarrow K^-\,\pi^+$)				
Γ_{42}	$\overline{K}^*(1680)^0\,\pi^+$		(3.7 $\pm$ 0.8)	$\times 10^{-3}$	
	$\times$ B($\overline{K}^*(1680)^0 \rightarrow K^-\,\pi^+$)				
Γ_{43}	$K^-\,\pi^+\,\pi^+$ nonresonant		(8.6 $\pm$ 0.8)	%	
Γ_{44}	$\overline{K}^0\,\pi^+\,\pi^0$	[d]	(9.7 $\pm$ 3.0)	%	S=1.1
Γ_{45}	$\overline{K}^0\,\rho^+$		(6.6 $\pm$ 2.5)	%	
Γ_{46}	$\overline{K}^*(892)^0\,\pi^+$		(6.4 $\pm$ 0.6)	$\times 10^{-3}$	
	$\times$ B($\overline{K}^{*0} \rightarrow \overline{K}^0\,\pi^0$)				
Γ_{47}	$\overline{K}^0\,\pi^+\,\pi^0$ nonresonant		(1.3 $\pm$ 1.1)	%	
Γ_{48}	$K^-\,\pi^+\,\pi^+\,\pi^0$	[d]	(6.4 $\pm$ 1.1)	%	
Γ_{49}	$\overline{K}^*(892)^0\,\rho^+$ total		(1.4 $\pm$ 0.9)	%	
	$\times$ B($\overline{K}^{*0} \rightarrow K^-\,\pi^+$)				
Γ_{50}	$\overline{K}_1(1400)^0\,\pi^+$		(2.1 $\pm$ 0.5)	%	
	$\times$ B($\overline{K}_1(1400)^0 \rightarrow K^-\,\pi^+\,\pi^0$)				
Γ_{51}	$K^-\,\rho^+\,\pi^+$ total		(3.1 $\pm$ 1.1)	%	
Γ_{52}	$K^-\,\rho^+\,\pi^+$ 3-body		(1.1 $\pm$ 0.4)	%	
Γ_{53}	$\overline{K}^*(892)^0\,\pi^+\,\pi^0$ total		(4.5 $\pm$ 0.9)	%	
	$\times$ B($\overline{K}^{*0} \rightarrow K^-\,\pi^+$)				
Γ_{54}	$\overline{K}^*(892)^0\,\pi^+\,\pi^0$ 3-body		(2.8 $\pm$ 0.9)	%	
	$\times$ B($\overline{K}^{*0} \rightarrow K^-\,\pi^+$)				
Γ_{55}	$K^*(892)^-\,\pi^+\,\pi^+$ 3-body		(7 $\pm$ 3)	$\times 10^{-3}$	
	$\times$ B($K^{*-} \rightarrow K^-\,\pi^0$)				
Γ_{56}	$K^-\,\pi^+\,\pi^+\,\pi^0$ nonresonant	[e]	(1.2 $\pm$ 0.6)	%	
Γ_{57}	$\overline{K}^0\,\pi^+\,\pi^+\,\pi^-$	[d]	(7.0 $\pm$ 0.9)	%	
Γ_{58}	$\overline{K}^0\,a_1(1260)^+$		(4.0 $\pm$ 0.9)	%	
	$\times$ B($a_1(1260)^+ \rightarrow \pi^+\,\pi^+\,\pi^-$)				
Γ_{59}	$\overline{K}_1(1400)^0\,\pi^+$		(2.1 $\pm$ 0.5)	%	
	$\times$ B($\overline{K}_1(1400)^0 \rightarrow \overline{K}^0\,\pi^+\,\pi^-$)				

Γ_{60}	$K^*(892)^-\pi^+\pi^+$ 3-body $\times$ B($K^{*-} \to \overline{K}^0\pi^-$)		(1.4 ± 0.6) %		
Γ_{61}	$\overline{K}^0\rho^0\pi^+$ total		(4.2 ± 0.9) %		
Γ_{62}	$\overline{K}^0\rho^0\pi^+$ 3-body		(5 ± 5) $\times 10^{-3}$		
Γ_{63}	$\overline{K}^0\pi^+\pi^+\pi^-$ nonresonant		(8 ± 4) $\times 10^{-3}$		
Γ_{64}	$K^-\pi^+\pi^+\pi^+\pi^-$	[d]	(7.3 ± 1.0) $\times 10^{-3}$		
Γ_{65}	$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$ $\times$ B($\overline{K}^{*0} \to K^-\pi^+$)		(5.5 ± 2.3) $\times 10^{-3}$		
Γ_{66}	$\overline{K}^*(892)^0\rho^0\pi^+$ $\times$ B($\overline{K}^{*0} \to K^-\pi^+$)		(1.9 $^{+\ 1.1}_{-\ 1.0}$) $\times 10^{-3}$		
Γ_{67}	$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$ no-ρ $\times$ B($\overline{K}^{*0} \to K^-\pi^+$)		(2.9 ± 1.1) $\times 10^{-3}$		
Γ_{68}	$K^-\rho^0\pi^+\pi^+$		(3.1 ± 1.0) $\times 10^{-3}$		
Γ_{69}	$K^-\pi^+\pi^+\pi^+\pi^-$ nonresonant		< 2.4	$\times 10^{-3}$	CL=90%
Γ_{70}	$K^-\pi^+\pi^+\pi^0\pi^0$				
Γ_{71}	$\overline{K}^0\pi^+\pi^+\pi^-\pi^0$				
Γ_{72}	$\overline{K}^0\pi^+\pi^+\pi^+\pi^-\pi^-$				
Γ_{73}	$K^-\pi^+\pi^+\pi^+\pi^-\pi^0$				
Γ_{74}	$\overline{K}^0\overline{K}^0K^+$		(1.8 ± 0.8) %		
Γ_{75}	$K^+K^-\overline{K}^0\pi^+$		(5.4 ± 1.4) $\times 10^{-4}$		

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

Γ_{76}	$\overline{K}^0\rho^+$		(6.6 ± 2.5) %		
Γ_{77}	$\overline{K}^0a_1(1260)^+$		(8.1 ± 1.7) %		
Γ_{78}	$\overline{K}^0a_2(1320)^+$		< 3	$\times 10^{-3}$	CL=90%
Γ_{79}	$\overline{K}^*(892)^0\pi^+$		(1.92± 0.19) %		
Γ_{80}	$\overline{K}^*(892)^0\rho^+$ total	[e]	(2.1 ± 1.4) %		
Γ_{81}	$\overline{K}^*(892)^0\rho^+$ S-wave	[e]	(1.7 ± 1.6) %		
Γ_{82}	$\overline{K}^*(892)^0\rho^+$ P-wave		< 1	$\times 10^{-3}$	CL=90%
Γ_{83}	$\overline{K}^*(892)^0\rho^+$ D-wave		(10 ± 7) $\times 10^{-3}$		
Γ_{84}	$\overline{K}^*(892)^0\rho^+$ D-wave longitudinal		< 7	$\times 10^{-3}$	CL=90%
Γ_{85}	$\overline{K}_1(1270)^0\pi^+$		< 7	$\times 10^{-3}$	CL=90%
Γ_{86}	$\overline{K}_1(1400)^0\pi^+$		(4.9 ± 1.2) %		
Γ_{87}	$\overline{K}^*(1410)^0\pi^+$				
Γ_{88}	$\overline{K}_0^*(1430)^0\pi^+$		(3.7 ± 0.4) %		
Γ_{89}	$\overline{K}^*(1680)^0\pi^+$		(1.45± 0.31) %		
Γ_{90}	$\overline{K}^*(892)^0\pi^+\pi^0$ total		(6.7 ± 1.4) %		
Γ_{91}	$\overline{K}^*(892)^0\pi^+\pi^0$ 3-body	[e]	(4.2 ± 1.4) %		
Γ_{92}	$K^*(892)^-\pi^+\pi^+$ total				
Γ_{93}	$K^*(892)^-\pi^+\pi^+$ 3-body		(2.1 ± 0.9) %		
Γ_{94}	$K^-\rho^+\pi^+$ total		(3.1 ± 1.1) %		

Γ_{95}	$K^-\rho^+\pi^+$ 3-body	(1.1 ± 0.4) %		
Γ_{96}	$\overline{K}^0\rho^0\pi^+$ total	(4.2 ± 0.9) %		CL=90%
Γ_{97}	$\overline{K}^0\rho^0\pi^+$ 3-body	(5 ± 5) $\times 10^{-3}$		
Γ_{98}	$\overline{K}^0 f_0(980)\pi^+$			
Γ_{99}	$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$	(8.2 ± 3.4) $\times 10^{-3}$		S=1.7
Γ_{100}	$\overline{K}^*(892)^0\rho^0\pi^+$	(2.9 $^{+\ 1.7}_{-\ 1.5}$) $\times 10^{-3}$		S=1.8
Γ_{101}	$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$ no-ρ	(4.3 ± 1.7) $\times 10^{-3}$		
Γ_{102}	$K^-\rho^0\pi^+\pi^+$	(3.1 ± 1.0) $\times 10^{-3}$		

Pionic modes

Γ_{103}	$\pi^+\pi^0$	(2.5 ± 0.7) $\times 10^{-3}$		
Γ_{104}	$\pi^+\pi^+\pi^-$	(3.1 ± 0.4) $\times 10^{-3}$		S=1.5
Γ_{105}	$\sigma\pi^+$	(2.1 ± 0.5) $\times 10^{-3}$		
Γ_{106}	$\rho^0\pi^+$	(1.04± 0.18) $\times 10^{-3}$		
Γ_{107}	$f_0(980)\pi^+ \times$ B($f_0 \to \pi^+\pi^-$)	[f] (1.9 ± 0.5) $\times 10^{-4}$		
Γ_{108}	$f_2(1270)\pi^+ \times$ B($f_2 \to \pi^+\pi^-$)	(6.0 ± 1.1) $\times 10^{-4}$		
Γ_{109}	$f_0(1370)\pi^+$			
Γ_{110}	$\rho(1450)^0\pi^+$			
Γ_{111}	$\pi^+\pi^+\pi^-$ nonresonant	(2.4 ± 2.1) $\times 10^{-4}$		
Γ_{112}	$\pi^+\pi^+\pi^-\pi^0$	—		
Γ_{113}	$\eta\pi^+ \times$ B($\eta \to \pi^+\pi^-\pi^0$)	(6.9 ± 1.4) $\times 10^{-4}$		
Γ_{114}	$\omega\pi^+ \times$ B($\omega \to \pi^+\pi^-\pi^0$)	< 6 $\times 10^{-3}$		CL=90%
Γ_{115}	$\pi^+\pi^+\pi^+\pi^-\pi^-$	(2.1 ± 0.4) $\times 10^{-3}$		
Γ_{116}	$\pi^+\pi^+\pi^+\pi^-\pi^-\pi^0$			

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

Γ_{117}	$\eta\pi^+$	(3.0 ± 0.6) $\times 10^{-3}$		
Γ_{118}	$\rho^0\pi^+$	(1.04± 0.18) $\times 10^{-3}$		
Γ_{119}	$\omega\pi^+$	< 7 $\times 10^{-3}$		CL=90%
Γ_{120}	$\eta\rho^+$	< 7 $\times 10^{-3}$		CL=90%
Γ_{121}	$\eta'(958)\pi^+$	(5.0 ± 1.0) $\times 10^{-3}$		
Γ_{122}	$\eta'(958)\rho^+$	< 5 $\times 10^{-3}$		CL=90%
Γ_{123}	$f_2(1270)\pi^+$	(1.06± 0.20) $\times 10^{-3}$		

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

Γ_{124}	$K^+\overline{K}^0$	(5.8 ± 0.6) $\times 10^{-3}$		S=1.2
Γ_{125}	$K^+K^-\pi^+$	[d] (8.8 ± 0.8) $\times 10^{-3}$		
Γ_{126}	$\phi\pi^+ \times$ B($\phi \to K^+K^-$)	(3.0 ± 0.3) $\times 10^{-3}$		
Γ_{127}	$K^+\overline{K}^*(892)^0 \times$ B($\overline{K}^{*0} \to K^-\pi^+$)	(2.8 ± 0.4) $\times 10^{-3}$		
Γ_{128}	$K^+K^-\pi^+$ nonresonant	(4.5 ± 0.9) $\times 10^{-3}$		
Γ_{129}	$K^0\overline{K}^0\pi^+$	—		

Γ_{130}	$K^*(892)^+\overline{K}^0$ $\times$ B($K^{*+} \to K^0\pi^+$)		(2.1 ± 0.9) %		
Γ_{131}	$K^+K^-\pi^+\pi^0$		—		
Γ_{132}	$\phi\pi^+\pi^0$ $\times$ B($\phi \to K^+K^-$)		(1.1 ± 0.5) %		
Γ_{133}	$\phi\rho^+$ $\times$ B($\phi \to K^+K^-$)		< 7	$\times 10^{-3}$	CL=90%
Γ_{134}	$K^+K^-\pi^+\pi^0$ non-ϕ		($1.5\ ^{+\ 0.7}_{-\ 0.6}$) %		
Γ_{135}	$K^+\overline{K}^0\pi^+\pi^-$		(4.0 ± 0.7) $\times 10^{-3}$		
Γ_{136}	$K^0K^-\pi^+\pi^+$		(5.4 ± 0.8) $\times 10^{-3}$		
Γ_{137}	$K^*(892)^+\overline{K}^*(892)^0$ $\times$ B^2($K^{*+} \to K^0\pi^+$)		(1.2 ± 0.5) %		
Γ_{138}	$K^0K^-\pi^+\pi^+$ non-$K^{*+}\overline{K}^{*0}$		< 7.9	$\times 10^{-3}$	CL=90%
Γ_{139}	$K^+K^-\pi^+\pi^+\pi^-$		—		
Γ_{140}	$\phi\pi^+\pi^+\pi^-$ $\times$ B($\phi \to K^+K^-$)		< 1	$\times 10^{-3}$	CL=90%
Γ_{141}	$K^+K^-\pi^+\pi^+\pi^-$ nonresonant		< 3	%	CL=90%

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

Γ_{142}	$\phi\pi^+$		(6.1 ± 0.6) $\times 10^{-3}$		
Γ_{143}	$\phi\pi^+\pi^0$		(2.3 ± 1.0) %		
Γ_{144}	$\phi\rho^+$		< 1.4	%	CL=90%
Γ_{145}	$\phi\pi^+\pi^+\pi^-$		< 2	$\times 10^{-3}$	CL=90%
Γ_{146}	$K^+\overline{K}^*(892)^0$		(4.2 ± 0.5) $\times 10^{-3}$		
Γ_{147}	$K^*(892)^+\overline{K}^0$		(3.1 ± 1.4) %		
Γ_{148}	$K^*(892)^+\overline{K}^*(892)^0$		(2.6 ± 1.1) %		

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_{149}	$K^+\pi^+\pi^-$	DC		(6.8 ± 1.5) $\times 10^{-4}$		
Γ_{150}	$K^+\rho^0$	DC		(2.5 ± 1.2) $\times 10^{-4}$		
Γ_{151}	$K^*(892)^0\pi^+$	DC		(3.6 ± 1.6) $\times 10^{-4}$		
Γ_{152}	$K^+\pi^+\pi^-$ nonresonant	DC		(2.5 ± 1.2) $\times 10^{-4}$		
Γ_{153}	$K^+K^+K^-$	DC		< 1.4	$\times 10^{-4}$	CL=90%
Γ_{154}	ϕK^+	DC		< 1.3	$\times 10^{-4}$	CL=90%
Γ_{155}	$\pi^+e^+e^-$	$C1$		< 5.2	$\times 10^{-5}$	CL=90%
Γ_{156}	$\pi^+\mu^+\mu^-$	$C1$		< 1.5	$\times 10^{-5}$	CL=90%
Γ_{157}	$\rho^+\mu^+\mu^-$	$C1$		< 5.6	$\times 10^{-4}$	CL=90%
Γ_{158}	$K^+e^+e^-$		[g]	< 2.0	$\times 10^{-4}$	CL=90%
Γ_{159}	$K^+\mu^+\mu^-$		[g]	< 4.4	$\times 10^{-5}$	CL=90%
Γ_{160}	$\pi^+e^\pm\mu^\mp$	LF	[h]	< 3.4	$\times 10^{-5}$	CL=90%
Γ_{161}	$\pi^+e^+\mu^-$					
Γ_{162}	$\pi^+e^-\mu^+$					

Γ_{163}	$K^+ e^\pm \mu^\mp$	*LF*	[*h*] < 6.8	$\times 10^{-5}$	CL=90%
Γ_{164}	$K^+ e^+ \mu^-$				
Γ_{165}	$K^+ e^- \mu^+$				
Γ_{166}	$\pi^- e^+ e^+$	*L*	< 9.6	$\times 10^{-5}$	CL=90%
Γ_{167}	$\pi^- \mu^+ \mu^+$	*L*	< 1.7	$\times 10^{-5}$	CL=90%
Γ_{168}	$\pi^- e^+ \mu^+$	*L*	< 5.0	$\times 10^{-5}$	CL=90%
Γ_{169}	$\rho^- \mu^+ \mu^+$	*L*	< 5.6	$\times 10^{-4}$	CL=90%
Γ_{170}	$K^- e^+ e^+$	*L*	< 1.2	$\times 10^{-4}$	CL=90%
Γ_{171}	$K^- \mu^+ \mu^+$	*L*	< 1.2	$\times 10^{-4}$	CL=90%
Γ_{172}	$K^- e^+ \mu^+$	*L*	< 1.3	$\times 10^{-4}$	CL=90%
Γ_{173}	$K^*(892)^- \mu^+ \mu^+$	*L*	< 8.5	$\times 10^{-4}$	CL=90%

Γ_{174} 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 $D^0 \to$ (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 value includes only $\pi^+ \pi^-$ decays of the intermediate resonance, because branching fractions of this resonance are not known.

[*g*] This mode is not a useful test for a $\Delta C=1$ weak neutral current because both quarks must change flavor in this decay.

[*h*] The value is for the sum of the charge states or particle/antiparticle states indicated.

CONSTRAINED FIT INFORMATION

An overall fit to 30 branching ratios uses 53 measurements and one constraint to determine 19 parameters. The overall fit has a $\chi^2 = 29.3$ 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, $x_i \equiv \Gamma_i / \Gamma_{\rm total}$. The fit constrains the x_i whose labels appear in this array to sum to one.

x_{13}	6									
x_{18}	5	2								
x_{27}	21	29	8							
x_{28}	17	7	31	26						
x_{38}	38	16	14	54	44					
x_{39}	38	16	14	57	45	96				
x_{44}	0	0	0	0	0	0	0			
x_{48}	9	4	3	13	10	22	23	0		
x_{57}	11	5	4	17	14	29	30	0	18	
x_{64}	18	8	7	28	22	47	49	0	11	15
x_{79}	25	11	9	37	30	63	65	0	15	20
x_{86}	6	3	2	9	7	15	16	0	31	37
x_{93}	3	1	1	5	4	8	9	0	29	13
x_{99}	6	3	2	9	7	15	15	0	3	5
x_{100}	4	2	2	6	5	10	11	0	2	3
x_{104}	18	8	7	28	22	47	49	0	11	15
x_{124}	23	10	9	35	28	59	61	0	14	18
x_{174}	−37	−27	−13	−42	−35	−55	−56	−58	−46	−46
	x_{11}	x_{13}	x_{18}	x_{27}	x_{28}	x_{38}	x_{39}	x_{44}	x_{48}	x_{57}

x_{79}	32							
x_{86}	8	10						
x_{93}	4	6	12					
x_{99}	29	10	2	1				
x_{100}	8	7	2	1	15			
x_{104}	24	32	8	4	8	5		
x_{124}	30	40	10	5	9	7	30	
x_{174}	−31	−39	−46	−32	−16	−10	−28	−35
	x_{64}	x_{79}	x_{86}	x_{93}	x_{99}	x_{100}	x_{104}	x_{124}

D^+ BRANCHING RATIOS

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

c-quark decays

$\Gamma(c \to e^+ \text{anything})/\Gamma(c \to \text{anything})$

We only put the average of e^+ and μ^+ measurements from $Z^0 \to c\overline{c}$ decays in the Summary Table; see below.

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
$0.103 \pm 0.009 ^{+0.009}_{-0.008}$	378	[3] ABBIENDI	99K	OPAL	$Z^0 \to c\overline{c}$

[3] ABBIENDI 99K uses the excess of right-sign over wrong-sign leptons opposite reconstructed $D^*(2010)^+ \to D^0\pi^+$ decays in $Z^0 \to c\overline{c}$.

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

We only put the average of e^+ and μ^+ measurements from $Z^0 \to c\overline{c}$ decays in the Summary Table; see below.

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.087 ± 0.006 OUR AVERAGE					
$0.095 \pm 0.007 ^{+0.014}_{-0.013}$	2829	ASTIER	00D	NOMD	ν_μ Fe $\to \mu^-\mu^+$ X
$0.090 \pm 0.007 ^{+0.007}_{-0.006}$	476	[4] ABBIENDI	99K	OPAL	$Z^0 \to c\overline{c}$
$0.086 \pm 0.017 ^{+0.008}_{-0.007}$	69	[5] ALBRECHT	92F	ARG	$e^+e^- \approx 10$ GeV
$0.078 \pm 0.009 \pm 0.012$		ONG	88	MRK2	e^+e^- 29 GeV
$0.078 \pm 0.015 \pm 0.02$		BARTEL	87	JADE	e^+e^- 34.6 GeV
$0.082 \pm 0.012 ^{+0.02}_{-0.01}$		ALTHOFF	84G	TASS	e^+e^- 34.5 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.089 \pm 0.018 \pm 0.025$		BARTEL	85J	JADE	See BARTEL 87

[4] ABBIENDI 99K uses the excess of right-sign over wrong-sign leptons opposite reconstructed $D^*(2010)^+ \to D^0\pi^+$ decays in $Z^0 \to c\overline{c}$.

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

$\Gamma(c \to \ell^+ \text{anything})/\Gamma(c \to \text{anything})$

This is an average (not a sum) of e^+ and μ^+ measurements.

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.096 ± 0.004 OUR AVERAGE					
$0.0958 \pm 0.0042 \pm 0.0028$	1828	[6] ABREU	00O	DLPH	$Z^0 \to c\overline{c}$
$0.095 \pm 0.006 ^{+0.007}_{-0.006}$	854	[7] ABBIENDI	99K	OPAL	$Z^0 \to c\overline{c}$

[6] ABREU 00O uses leptons opposite fully reconstructed $D^*(2010)^+$, D^+, or D^0 mesons.

[7] ABBIENDI 99K uses the excess of right-sign over wrong-sign leptons opposite reconstructed $D^*(2010)^+ \to D^0\pi^+$ decays in $Z^0 \to c\overline{c}$.

$\Gamma(c \to D^*(2010)^+ \text{anything})/\Gamma(c \to \text{anything})$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.255±0.015±0.008	2371	[8] ABREU	000	DLPH	$Z^0 \to c\overline{c}$

[8] ABREU 000 uses slow pions opposite fully reconstructed $D^*(2010)^+$, D^+, or D^0 mesons as a signal of $D^*(2010)^-$ production.

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, pp 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 $D^0 \to (e^+ \text{anything})$ / (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 $E_{\text{cm}} = 3.77$ 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		[9] 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	[10] ALBRECHT	96C	ARG	e^+e^- $\approx$ 10 GeV
0.134±0.015±0.010		[11] ABE	93E	VNS	e^+e^- 58 GeV
$0.098\pm0.009\ ^{+0.006}_{-0.005}$	240	[12] ALBRECHT	92F	ARG	e^+e^- $\approx$ 10 GeV
0.096±0.007±0.015		[13] ONG	88	MRK2	e^+e^- 29 GeV
$0.116\ ^{+0.011}_{-0.009}$		[13] PAL	86	DLCO	e^+e^- 29 GeV
0.091±0.009±0.013		[13] AIHARA	85	TPC	e^+e^- 29 GeV
0.092±0.022±0.040		[13] ALTHOFF	84J	TASS	e^+e^- 34.6 GeV
0.091±0.013		[13] KOOP	84	DLCO	See PAL 86
0.08 ±0.015		[14] BACINO	79	DLCO	e^+e^- 3.772 GeV

[9] Isolates D^+ and $D^0 \to e^+ X$ and weights for relative production (44%–56%).

[10] ALBRECHT 96C uses e^- in the hemisphere opposite to $D^{*+} \to D^0\pi^+$ events.

[11] ABE 93E also measures forward-backward asymmetries and fragmentation functions for c and b quarks.

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

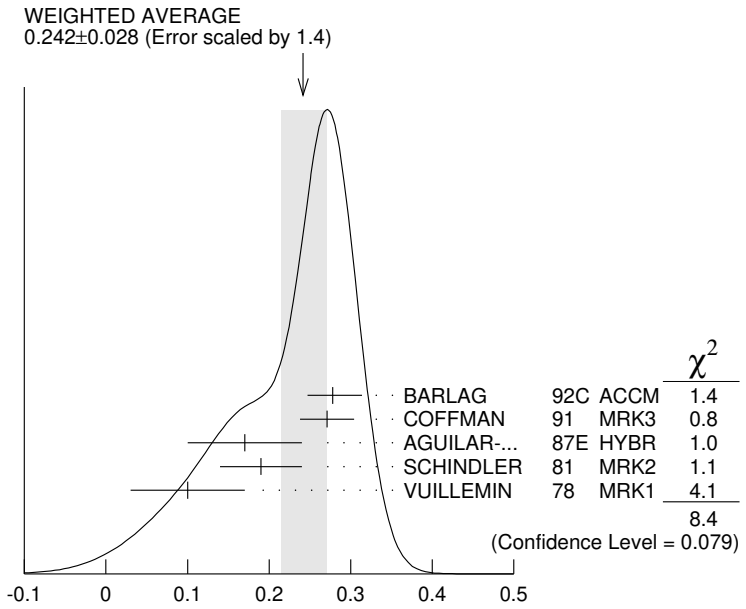
[13] Average BR for charm $\to e^+ X$. Unlike at $E_{\text{cm}} = 3.77$ GeV, the admixture of charmed mesons is unknown.

[14] Not independent of BACINO 80 measurements of $\Gamma(e^+ \text{anything})/\Gamma_{\text{total}}$ for the D^+ and D^0 separately.

$\Gamma(K^-\text{anything})/\Gamma_{\text{total}}$ 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.			
$0.278^{+0.036}_{-0.031}$		[15] 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

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



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

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

$\Gamma(K^+ \text{anything})/\Gamma_{\text{total}}$ 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, pp 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 $E_{\text{cm}} = 3.77$ 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	[16] BRANDELIK	79	DASP	e^+e^- 4.03 GeV

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

$\Gamma(\phi \text{ anything})/\Gamma_{\text{total}}$ Γ_6/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.018	90	[17] BAI	00C	BES	$e^+e^- \rightarrow D\overline{D}^*, D^*\overline{D}^*$

[17] BAI 00C finds the average (ϕ anything) branching fraction for the 4.03-GeV mix of D^+ and D^0 mesons to be (1.34 ± 0.52 ± 0.12)%.

$\Gamma(\phi e^+ \text{ anything})/\Gamma_{\text{total}}$ Γ_7/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.016	90	BAI	00C	BES	$e^+e^- \rightarrow D\overline{D}^*, D^*\overline{D}^*$

Leptonic and semileptonic modes

$\Gamma(\mu^+\nu_\mu)/\Gamma_{\text{total}}$ Γ_9/Γ

See the "Note on Pseudoscalar-Meson Decay Constants" in the Listings for the $\pi^\pm$.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.0008\ ^{+0.0016+0.0005}_{-0.0005-0.0002}}$		1	[18] BAI	98B	BES	$e^+e^- \rightarrow D^{*+}D^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
< 0.00072	90		ADLER	88B	MRK3	e^+e^- 3.77 GeV
< 0.02	90	0	[19] AUBERT	83	SPEC	μ^+ Fe, 250 GeV

[18] BAI 98B obtains $f_D = (300\ ^{+180+80}_{-150-40})$ MeV from this measurement.

[19] 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.

$\Gamma(\overline{K}^0 \ell^+ \nu_\ell)/\Gamma_{\text{total}}$ Γ_{10}/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
0.067±0.008 OUR AVERAGE			
0.066±0.009	PDG	02	Our $\Gamma(\overline{K}^0 e^+ \nu_e)/\Gamma_{\text{total}}$
$0.072^{+0.031}_{-0.020}$	PDG	02	1.03 × our $\Gamma(\overline{K}^0 \mu^+ \nu_\mu)/\Gamma_{\text{total}}$

$\Gamma(\overline{K}^0 e^+ \nu_e)/\Gamma_{\text{total}}$ Γ_{11}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.066±0.009 OUR FIT					
$0.06\ ^{+0.022}_{-0.013}\pm0.007$	13	BAI	91	MRK3	$e^+e^- \approx$ 3.77 GeV

$\Gamma(\overline{K}^0 e^+ \nu_e)/\Gamma(\overline{K}^0 \pi^+)$ Γ_{11}/Γ_{38}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
2.38±0.31 OUR FIT					
2.60±0.35±0.26	186	[20] BEAN	93C	CLE2	$e^+e^- \approx \Upsilon(4S)$

[20] 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_{11}/Γ_{39}

VALUE	DOCUMENT ID		TECN	COMMENT
0.73±0.09 OUR FIT				
0.66±0.09±0.14	ANJOS	91C	E691	γ Be 80–240 GeV

$\Gamma(\overline{K}^0 \mu^+ \nu_\mu)/\Gamma_{\text{total}}$ Γ_{12}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$0.07\ ^{+0.028}_{-0.016}\pm0.012$	14	BAI	91	MRK3	$e^+e^- \approx$ 3.77 GeV

$\Gamma(\overline{K}^0 \mu^+ \nu_\mu)/\Gamma(\mu^+ \text{anything})$ Γ_{12}/Γ_8

VALUE	EVTS	DOCUMENT ID		COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.76±0.06	84	[21] AOKI	88	π^- emulsion

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

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$0.041\ ^{+0.009}_{-0.007}$ OUR FIT						
$0.035\ ^{+0.012}_{-0.007}\pm0.004$		14	[22] BAI	91	MRK3	$e^+e^- \approx$ 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.057	90		[23] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV

[22] 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 $\overline{K}^*(892) e^+ \nu_e$.

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

$\Gamma(\overline{K}^*(892)^0 \ell^+ \nu_\ell)/\Gamma_{\text{total}}$ Γ_{26}/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
0.048±0.004 OUR AVERAGE			
0.048±0.005	PDG	02	Our $\Gamma(\overline{K}^{*0} e^+ \nu_e)/\Gamma_{\text{total}}$
0.047±0.006	PDG	02	1.05 × our $\Gamma(\overline{K}^{*0} \mu^+ \nu_\mu)/\Gamma_{\text{total}}$

$\Gamma(\overline{K}^*(892)^0 e^+ \nu_e)/\Gamma(K^-\pi^+ e^+ \nu_e)$ Γ_{27}/Γ_{13}

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{1.16^{+0.20}_{-0.24}}$ **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_{27}/Γ_{39}

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	[24] 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

[24] 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.

$\Gamma(K^-\pi^+ e^+ \nu_e \text{ nonresonant})/\Gamma_{\text{total}}$ Γ_{15}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.007	90	[25] ANJOS	89B	E691	Photoproduction

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

$\Gamma(K^-\pi^+\mu^+\nu_\mu)/\Gamma_{\text{total}}$ $\Gamma_{16}/\Gamma = (\Gamma_{18}+\frac{2}{3}\Gamma_{28})/\Gamma$

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

$\Gamma(\overline{K}^*(892)^0 \mu^+ \nu_\mu)/\Gamma_{\text{total}}$ Γ_{28}/Γ

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.045 ±0.006 OUR FIT Error includes scale factor of 1.1.					
0.0325±0.0071±0.0075	224	[26] KODAMA	92C	E653	π^- emulsion 600 GeV

[26] KODAMA 92C measures $\Gamma(D^+ \to \overline{K}^{*0}\mu^+\nu_\mu)/\Gamma(D^0 \to K^-\mu^+\nu_\mu) = 0.43 \pm 0.09 \pm 0.09$ and then uses $\Gamma(D^0 \to K^-\mu^+\nu_\mu) = (7.0 \pm 0.7) \times 10^{10}\,\text{s}^{-1}$ 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_{28}/Γ_{39}

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	[27] KODAMA	92C	E653	π^- emulsion 600 GeV

[27] 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.

$\Gamma(K^-\pi^+\mu^+\nu_\mu \text{ nonresonant})/\Gamma(K^-\pi^+\mu^+\nu_\mu)$ $\Gamma_{18}/\Gamma_{16} = \Gamma_{18}/(\Gamma_{18}+\frac{2}{3}\Gamma_{28})$

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

$\Gamma(\overline{K}^0\pi^+\pi^-e^+\nu_e)/\Gamma_{\text{total}}$ Γ_{19}/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	[28] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV

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

$\Gamma(K^-\pi^+\pi^0e^+\nu_e)/\Gamma_{\text{total}}$ Γ_{20}/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	[29] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV

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

$\Gamma((\overline{K}^*(892)\pi)^0e^+\nu_e)/\Gamma_{\text{total}}$ Γ_{21}/Γ

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

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

$\Gamma((\overline{K}\pi\pi)^0e^+\nu_e \text{ non-}\overline{K}^*(892))/\Gamma_{\text{total}}$ Γ_{22}/Γ

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

$\Gamma(K^-\pi^+\pi^0\mu^+\nu_\mu)/\Gamma(K^-\pi^+\mu^+\nu_\mu)$ $\Gamma_{23}/\Gamma_{16} = \Gamma_{23}/(\Gamma_{18}+\frac{2}{3}\Gamma_{28})$

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

$\Gamma(\overline{K}_1(1270)^0\mu^+\nu_\mu)/\Gamma(\overline{K}^*(892)^0\mu^+\nu_\mu)$ Γ_{29}/Γ_{28}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.78	95	ABE	99P	CDF	$\overline{p}p$ 1.8 TeV

$\Gamma(\overline{K}^*(1410)^0\mu^+\nu_\mu)/\Gamma(\overline{K}^*(892)^0\mu^+\nu_\mu)$ Γ_{30}/Γ_{28}

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.60	95	ABE	99P CDF	$\overline{p}p$ 1.8 TeV

$\Gamma(\overline{K}_2^*(1430)^0\mu^+\nu_\mu)/\Gamma(\overline{K}^*(892)^0\mu^+\nu_\mu)$ Γ_{31}/Γ_{28}

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.19	95	ABE	99P CDF	$\overline{p}p$ 1.8 TeV

$\Gamma(\pi^0\ell^+\nu_\ell)/\Gamma(\overline{K}^0\ell^+\nu_\ell)$ Γ_{24}/Γ_{10}

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.046±0.014±0.017	100	[30] 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	[31] ALAM	93 CLE2	See BARTELT 97

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

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

$\Gamma(\pi^+\pi^-e^+\nu_e)/\Gamma_{total}$ Γ_{25}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.057	90	[32] AGUILAR-...	87F HYBR	πp, pp 360, 400 GeV

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

$\Gamma(\rho^0e^+\nu_e)/\Gamma_{total}$ Γ_{32}/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

$\Gamma(\rho^0e^+\nu_e)/\Gamma(\overline{K}^*(892)^0e^+\nu_e)$ Γ_{32}/Γ_{27}

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.045±0.014±0.009	49	[33] AITALA	97 E791	π^- nucleus, 500 GeV

[33] 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_{33}/Γ_{28}

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.061±0.014 OUR AVERAGE				
0.051±0.015±0.009	54	[34] AITALA	97 E791	π^- nucleus, 500 GeV
0.079±0.019±0.013	39	[35] 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	[36] KODAMA	93C E653	π^- emulsion 600 GeV

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

[35] 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.

[36] 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.

$\Gamma(\phi e^+ \nu_e)/\Gamma_{total}$ Γ_{34}/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	$e^+ e^-$ ≈ 3.77 GeV

$\Gamma(\phi \mu^+ \nu_\mu)/\Gamma_{total}$ Γ_{35}/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	$e^+ e^-$ ≈ 3.77 GeV

$\Gamma(\eta \ell^+ \nu_\ell)/\Gamma(\pi^0 \ell^+ \nu_\ell)$ Γ_{36}/Γ_{24}

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

$\Gamma(\eta'(958) \mu^+ \nu_\mu)/\Gamma(\overline{K}^*(892)^0 \mu^+ \nu_\mu)$ Γ_{37}/Γ_{28}

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_{38}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0277±0.0018 OUR FIT					
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	[37] SCHINDLER	81	MRK2	$e^+ e^-$ 3.771 GeV
0.033 ±0.013	17	[38] PERUZZI	77	MRK1	$e^+ e^-$ 3.77 GeV

[37] SCHINDLER 81 (MARK-2) measures $\sigma(e^+ e^- \to \psi(3770)) \times$ 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.

[38] PERUZZI 77 (MARK-1) measures $\sigma(e^+ e^- \to \psi(3770)) \times$ 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_{38}/Γ_{39}

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
0.306 ±0.006 OUR FIT					
0.307 ±0.005 OUR AVERAGE					
0.3060±0.0046±0.0032	10.6k	LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma$ ≈ 180 GeV
0.348 ±0.024 ±0.022	473	[39] BISHAI	97	CLE2	$e^+ e^-$ ≈ $\Upsilon(4S)$
0.274 ±0.030 ±0.031	264	ANJOS	90C	E691	Photoproduction

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.091±0.006 OUR FIT					
0.091±0.007 OUR AVERAGE					
0.093±0.006±0.008	1502	[40] 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	[41] SCHINDLER	81	MRK2	e^+e^- 3.771 GeV
0.086±0.020	85	[42] PERUZZI	77	MRK1	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.064^{+0.015}_{-0.014}$		[43] BARLAG	92C	ACCM	π^- Cu 230 GeV
$0.063^{+0.028}_{-0.014}\pm0.011$	8	[43] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV

[40] 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).

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

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

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

$\Gamma(\overline{K}^*(892)^0\pi^+)/\Gamma(K^-\pi^+\pi^+)$ Γ_{79}/Γ_{39}

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_{88}/Γ_{39}

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_{89}/Γ_{39}

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

$\Gamma(K^-\pi^+\pi^+$ nonresonant$)/\Gamma(K^-\pi^+\pi^+)$ Γ_{43}/Γ_{39}

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_{44}/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	[44] SCHINDLER	81	MRK2	e^+e^- 3.771 GeV

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

$\Gamma(\overline{K}^0\rho^+)/\Gamma(\overline{K}^0\pi^+\pi^0)$ Γ_{45}/Γ_{44}

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_{79}/Γ_{44}

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

$\Gamma(\overline{K}^0\pi^+\pi^0$ nonresonant$)/\Gamma(\overline{K}^0\pi^+\pi^0)$ Γ_{47}/Γ_{44}

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_{48}/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. • • •					
$0.034^{+0.056}_{-0.070}$		[45] BARLAG	92C	ACCM	π^- Cu 230 GeV
$0.022^{+0.047}_{-0.006}\pm0.004$	1	[45] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV
$0.063^{+0.014}_{-0.013}\pm0.012$	175	BALTRUSAIT...	86E	MRK3	See COFFMAN 92B

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

$\Gamma(K^-\pi^+\pi^+\pi^0)/\Gamma(K^-\pi^+\pi^+)$ Γ_{48}/Γ_{39}

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_{80}/Γ_{48}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.33±0.165±0.12	[46] ANJOS	92C	E691	γ Be 90–260 GeV

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

$\Gamma(\overline{K}^*(892)^0\rho^+ S\text{-wave})/\Gamma(K^-\pi^+\pi^+\pi^0)$ Γ_{81}/Γ_{48}

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

$\Gamma(\overline{K}^*(892)^0\rho^+ P\text{-wave})/\Gamma_{\text{total}}$ Γ_{82}/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

$\Gamma(\overline{K}^*(892)^0\rho^+ D\text{-wave})/\Gamma(K^-\pi^+\pi^+\pi^0)$ Γ_{83}/Γ_{48}

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

$\Gamma(\overline{K}^*(892)^0\rho^+ D\text{-wave longitudinal})/\Gamma_{\text{total}}$ Γ_{84}/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

$\Gamma(\overline{K}_1(1400)^0\pi^+)/\Gamma(K^-\pi^+\pi^+\pi^0)$ Γ_{86}/Γ_{48}

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

$\Gamma(K^-\rho^+\pi^+ \text{total})/\Gamma(K^-\pi^+\pi^+\pi^0)$ Γ_{94}/Γ_{48}

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

$\Gamma(K^-\rho^+\pi^+ \text{3-body})/\Gamma(K^-\pi^+\pi^+\pi^0)$ Γ_{95}/Γ_{48}

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

$\Gamma(\overline{K}^*(892)^0\pi^+\pi^0\,\text{total})/\Gamma(K^-\pi^+\pi^+\pi^0)$ Γ_{90}/Γ_{48}

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

$\Gamma(\overline{K}^*(892)^0\pi^+\pi^0\,\text{3-body})/\Gamma_{\text{total}}$ Γ_{91}/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	[47] COFFMAN	92B MRK3	e^+e^- 3.77 GeV

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

$\Gamma(\overline{K}^*(892)^0\pi^+\pi^0\,\text{3-body})/\Gamma(K^-\pi^+\pi^+\pi^0)$ Γ_{91}/Γ_{48}

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

$\Gamma(K^*(892)^-\pi^+\pi^+\,\text{3-body})/\Gamma(K^-\pi^+\pi^+\pi^0)$ Γ_{93}/Γ_{48}

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

$\Gamma(K^-\pi^+\pi^+\pi^0\ \text{nonresonant})/\Gamma_{\text{total}}$ Γ_{56}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.002	90	[48] ANJOS	92C E691	γ Be 90–260 GeV

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

$\Gamma(K^-\pi^+\pi^+\pi^0\ \text{nonresonant})/\Gamma(K^-\pi^+\pi^+\pi^0)$ Γ_{56}/Γ_{48}

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

$\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{57}/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	[49] SCHINDLER	81 MRK2	e^+e^- 3.771 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.042^{+0.019}_{-0.017}$		[50] BARLAG	92C ACCM	π^- Cu 230 GeV
$0.243^{+0.064}_{-0.041}\pm0.041$	11	[50] AGUILAR-...	87F HYBR	πp, pp 360, 400 GeV

[49] SCHINDLER 81 (MARK-2) measures $\sigma(e^+e^-\to\psi(3770))\times$ branching fraction to be 0.51 ± 0.08 nb. We use the MARK-3 (ADLER 88C) value of $\sigma = 4.2\pm0.6\pm0.3$ nb.

[50] 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_{57}/Γ_{39}

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

$\Gamma(\overline{K}^0 a_1(1260)^+)/\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)$ Γ_{77}/Γ_{57}

Unseen decay modes of the $a_1(1260)^+$ are included, assuming that the $a_1(1260)^+$ decays entirely to $\rho\pi$ [or at least to $(\pi\pi)_{I=1}\ \pi$].

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

$\Gamma(\overline{K}^0 a_2(1320)^+)/\Gamma_{total}$ Γ_{78}/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

$\Gamma(\overline{K}_1(1270)^0\pi^+)/\Gamma_{total}$ Γ_{85}/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

$\Gamma(\overline{K}_1(1400)^0\pi^+)/\Gamma_{total}$ Γ_{86}/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	[51] ANJOS	92C E691	γ Be 90–260 GeV

[51] 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.

$\Gamma(\overline{K}_1(1400)^0\pi^+)/\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)$ Γ_{86}/Γ_{57}

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

$\Gamma(\overline{K}^*(1410)^0\pi^+)/\Gamma_{total}$ Γ_{87}/Γ

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

$\Gamma(K^*(892)^-\pi^+\pi^+\text{ total})/\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)$ Γ_{92}/Γ_{57}

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

$\Gamma(K^*(892)^-\pi^+\pi^+\text{ 3-body})/\Gamma_{\text{total}}$ Γ_{93}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
0.021 ± 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_{93}/Γ_{57}

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.				
$0.50\pm0.09\pm0.21$	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_{96}/Γ_{57}

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$0.60\pm0.10\pm0.17$	90	ANJOS	92C	E691	γ Be 90–260 GeV

$\Gamma(\overline{K}^0\rho^0\pi^+\text{ 3-body})/\Gamma_{\text{total}}$ Γ_{97}/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_{97}/Γ_{57}

VALUE	DOCUMENT ID		TECN	COMMENT
$0.07\pm0.04\pm0.06$	ANJOS	92C	E691	γ Be 90–260 GeV

$\Gamma(\overline{K}^0 f_0(980)\pi^+)/\Gamma_{\text{total}}$ Γ_{98}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<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_{63}/Γ_{57}

VALUE	DOCUMENT ID		TECN	COMMENT
0.12 ± 0.06 OUR AVERAGE				
$0.10\pm0.04\ \pm0.06$	ANJOS	92C	E691	γ Be 90–260 GeV
$0.17\pm0.056\pm0.100$	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

$\Gamma(K^-\pi^+\pi^+\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{64}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$0.0037^{+0.0012}_{-0.0010}$	[52] BARLAG	92C ACCM	π^- Cu 230 GeV

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

$\Gamma(K^-\pi^+\pi^+\pi^+\pi^-)/\Gamma(K^-\pi^+\pi^+)$ Γ_{64}/Γ_{39}

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_{99}/Γ_{64}

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_{100}/Γ_{39}

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_{100}/Γ_{99}

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

$\Gamma(\overline{K}^*(892)^0\pi^+\pi^+\pi^-$ no-$\rho)/\Gamma(K^-\pi^+\pi^+)$ Γ_{101}/Γ_{39}

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_{68}/Γ_{39}

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

$\Gamma(K^-\pi^+\pi^+\pi^+\pi^-$ nonresonant$)/\Gamma(K^-\pi^+\pi^+)$ Γ_{69}/Γ_{39}

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

$\Gamma(K^-\pi^+\pi^+\pi^0\pi^0)/\Gamma_{total}$ Γ_{70}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.015		[53] BARLAG	92C	ACCM	π^- Cu 230 GeV
$0.022^{+0.047}_{-0.008}\pm0.004$	1	[53] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV

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

$\Gamma(\overline{K}^0\pi^+\pi^+\pi^-\pi^0)/\Gamma_{total}$ Γ_{71}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.099^{+0.036}_{-0.070}$		[54] BARLAG	92C	ACCM	π^- Cu 230 GeV
$0.044^{+0.052}_{-0.013}\pm0.007$	2	[54] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV

[54] 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_{72}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.0008 ± 0.0007	[55] BARLAG	92C	ACCM	π^- Cu 230 GeV

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

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

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.0020 ± 0.0018	[56] BARLAG	92C	ACCM	π^- Cu 230 GeV

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

$\Gamma(\overline{K}^0\overline{K}^0K^+)/\Gamma(K^-\pi^+\pi^+)$ Γ_{74}/Γ_{39}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.20 ± 0.09 OUR AVERAGE Error includes scale factor of 2.4.					
$0.14\pm0.04\pm0.02$	39	ALBRECHT	94I	ARG	$e^+e^-\approx 10$ GeV
0.34 ± 0.07	70	AMMAR	91	CLEO	$e^+e^-\approx$ 10.5 GeV

$\Gamma(K^+K^-\overline{K}^0\pi^+)/\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)$ Γ_{75}/Γ_{57}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$0.0077\pm0.0015\pm0.0009$	35	LINK	01C	FOCS	γ nucleus, $\overline{E}_\gamma\approx$ 180 GeV

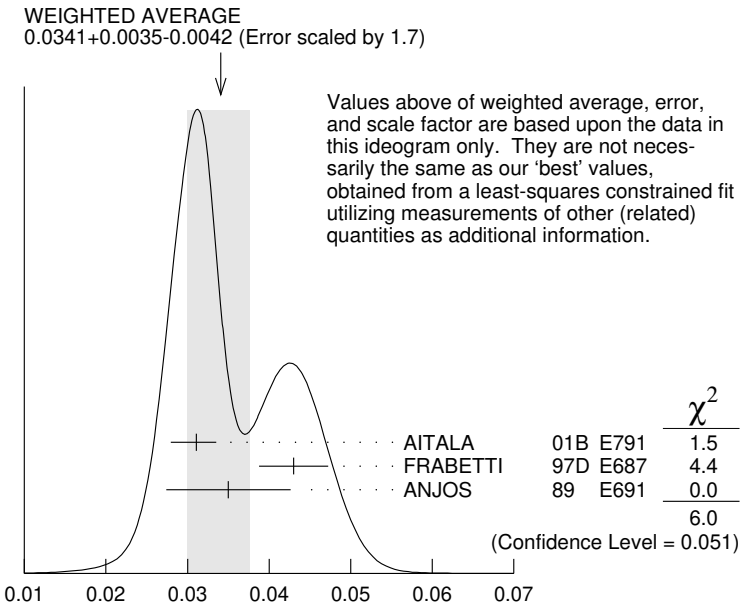
Pionic modes

$\Gamma(\pi^+\pi^0)/\Gamma(K^-\pi^+\pi^+)$ Γ_{103}/Γ_{39}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$0.028\pm0.006\pm0.005$	34	SELEN	93	CLE2	$e^+e^-\approx\ \Upsilon(4S)$

$\Gamma(\pi^+\pi^+\pi^-)/\Gamma(K^-\pi^+\pi^+)$ Γ_{104}/Γ_{39}

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.034 ±0.004 OUR FIT Error includes scale factor of 2.0.				
$0.0341^{+0.0035}_{-0.0042}$ OUR AVERAGE Error includes scale factor of 1.7. See the ideogram below.				
$0.0311 \pm 0.0018^{+0.0016}_{-0.0026}$	1172	AITALA	01B E791	π^- nucleus, 500 GeV
0.043 ±0.003 ±0.003	236	FRABETTI	97D E687	γ Be $\approx$ 200 GeV
0.035 ±0.007 ±0.003	83	ANJOS	89 E691	Photoproduction
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.032 ±0.011 ±0.003	20	ADAMOVICH	93 WA82	π^- 340 GeV
0.042 ±0.016 ±0.010	57	BALTRUSAIT...	85E MRK3	e^+e^- 3.77 GeV



$\Gamma(\pi^+\pi^+\pi^-)/\Gamma(K^-\pi^+\pi^+)$

$\Gamma(\sigma\pi^+)/\Gamma(\pi^+\pi^+\pi^-)$ $\Gamma_{105}/\Gamma_{104}$

Unseen decay modes of the σ are included.

VALUE	DOCUMENT ID	TECN	COMMENT
0.695±0.135±0.032	[57] AITALA	01B E791	π^- nucleus, 500 GeV

[57] See AITALA 01B for the magnitude and phase of this amplitude relative to the $\rho^0\pi^+$ amplitude. The branching ratio given here is 3/2 the paper's value, to allow for $\pi^0\pi^0$ decays.

$\Gamma(\rho^0\pi^+)/\Gamma(\pi^+\pi^+\pi^-)$ $\Gamma_{106}/\Gamma_{104}$

VALUE	DOCUMENT ID		TECN	COMMENT
0.336 ± 0.032 ± 0.022	AITALA	01B	E791	π^- nucleus, 500 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.289 ± 0.055 ± 0.058	[58] FRABETTI	97D	E687	γ Be $\approx$ 200 GeV

[58] 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_{106}/Γ_{39}

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

$\Gamma(f_0(980)\pi^+ \times B(f_0 \to \pi^+\pi^-))/\Gamma(\pi^+\pi^+\pi^-)$ $\Gamma_{107}/\Gamma_{104}$

This includes only the $\pi^+\pi^-$ decays of the $f_0(980)$, because branching fractions of this resonance are not known.

VALUE	DOCUMENT ID		TECN	COMMENT
0.062 ± 0.013 ± 0.004	[59] AITALA	01B	E791	π^- nucleus, 500 GeV

[59] See AITALA 01B for the magnitude and phase of this amplitude relative to the $\rho^0\pi^+$ amplitude.

$\Gamma(f_2(1270)\pi^+)/\Gamma(\pi^+\pi^+\pi^-)$ $\Gamma_{123}/\Gamma_{104}$

Unseen decay modes of the $f_2(1270)$ are included.

VALUE	DOCUMENT ID		TECN	COMMENT
0.343 ± 0.044 ± 0.007	[60] AITALA	01B	E791	π^- nucleus, 500 GeV

[60] See AITALA 01B for the magnitude and phase of this amplitude relative to the $\rho^0\pi^+$ amplitude.

$\Gamma(f_0(1370)\pi^+)/\Gamma(\pi^+\pi^+\pi^-)$ $\Gamma_{109}/\Gamma_{104}$

This includes only the $\pi^+\pi^-$ decays of the $f_0(1370)$, because branching fractions of this resonance are not known.

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.023 ± 0.015 ± 0.008	[61] AITALA	01B	E791	π^- nucleus, 500 GeV

[61] This AITALA 01B result does not have enough statistical significance to advance it to the Summary Tables.

$\Gamma(\rho(1450)^0\pi^+)/\Gamma(\pi^+\pi^+\pi^-)$ $\Gamma_{110}/\Gamma_{104}$

This includes only the $\pi^+\pi^-$ decays of the $\rho(1450)$, because branching fractions of this resonance are not known.

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.007 ± 0.007 ± 0.003	[62] AITALA	01B	E791	π^- nucleus, 500 GeV

[62] This AITALA 01B result does not have enough statistical significance to advance it to the Summary Tables.

$\Gamma(\pi^+\pi^+\pi^-$ nonresonant$)/\Gamma(\pi^+\pi^+\pi^-)$ $\Gamma_{111}/\Gamma_{104}$

The big difference between the results here of AITALA 01B and FRABETTI 97D is the addition of the $\sigma\pi^+$ channel to the AITALA 01B fit.

VALUE	DOCUMENT ID		TECN	COMMENT
0.078 ± 0.060 ± 0.027	[63] AITALA	01B	E791	π^- nucleus, 500 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.589 ± 0.105 ± 0.081	[64] FRABETTI	97D	E687	γ Be $\approx$ 200 GeV

[63] See AITALA 01B for the magnitude and phase of this amplitude relative to the $\rho^0\pi^+$ amplitude.

[64] 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_{111}/Γ_{39}

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.027 ± 0.007 ± 0.002	ANJOS	89	E691	Photoproduction

$\Gamma(\pi^+\pi^+\pi^-\pi^0)/\Gamma_{total}$ Γ_{112}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.019^{+0.015}_{-0.012}$	[65] BARLAG	92C	ACCM	π^- Cu 230 GeV

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

$\Gamma(\pi^+\pi^+\pi^-\pi^0)/\Gamma(K^-\pi^+\pi^+)$ Γ_{112}/Γ_{39}

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

$\Gamma(\eta\pi^+)/\Gamma(\phi\pi^+)$ $\Gamma_{117}/\Gamma_{142}$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.49 ± 0.08	275	JESSOP	98	CLE2	$e^+e^-\approx\ \Upsilon(4S)$

$\Gamma(\eta\pi^+)/\Gamma(K^-\pi^+\pi^+)$ Γ_{117}/Γ_{39}

Unseen decay modes of the η are included.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
0.083 ± 0.023 ± 0.014		99	DAOUDI	92	CLE2	See JESSOP 98
<0.12	90		ANJOS	89E	E691	Photoproduction

$\Gamma(\omega\pi^+)/\Gamma(K^-\pi^+\pi^+)$ Γ_{119}/Γ_{39}

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_{115}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.0010^{+0.0008}_{-0.0007}$	[66] BARLAG	92C	ACCM	π^- Cu 230 GeV

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

$\Gamma(\pi^+\pi^+\pi^+\pi^-\pi^-)/\Gamma(K^-\pi^+\pi^+)$ Γ_{115}/Γ_{39}

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

$\Gamma(\eta\rho^+)/\Gamma(\phi\pi^+)$ $\Gamma_{120}/\Gamma_{142}$

Unseen decay modes of the η are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.11	90	JESSOP	98	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\eta\rho^+)/\Gamma(K^-\pi^+\pi^+)$ Γ_{120}/Γ_{39}

Unseen decay modes of the η are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT

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

<0.13	90	DAOUDI	92	CLE2	See JESSOP 98

$\Gamma(\pi^+\pi^+\pi^+\pi^-\pi^-\pi^0)/\Gamma_{total}$ Γ_{116}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT

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

$0.0029^{+0.0029}_{-0.0020}$	[67] BARLAG	92C	ACCM	π^- Cu 230 GeV

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

$\Gamma(\eta'(958)\pi^+)/\Gamma(\phi\pi^+)$ $\Gamma_{121}/\Gamma_{142}$

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.82±0.14	126	JESSOP	98	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\eta'(958)\pi^+)/\Gamma(K^-\pi^+\pi^+)$ Γ_{121}/Γ_{39}

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT

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

<0.1	90	DAOUDI	92	CLE2	See JESSOP 98
<0.1	90	ALVAREZ	91	NA14	Photoproduction
<0.13	90	ANJOS	91B	E691	γ Be, $\overline{E}_\gamma \approx$ 145 GeV

$\Gamma(\eta'(958)\rho^+)/\Gamma(\phi\pi^+)$ $\Gamma_{122}/\Gamma_{142}$

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.86	90	JESSOP	98	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\eta'(958)\rho^+)/\Gamma(K^-\pi^+\pi^+)$ Γ_{122}/Γ_{39}

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT

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

<0.17	90	DAOUDI	92	CLE2	See JESSOP 98

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

$\Gamma(K^+\overline{K}^0)/\Gamma(\overline{K}^0\pi^+)$ Γ_{124}/Γ_{38}

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
0.211 ±0.018 OUR FIT Error includes scale factor of 1.3.					
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. • • •					
0.1996±0.0119±0.0096	949	[68] LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma \approx 180$ GeV
0.222 ±0.041 ±0.029	70	[69] BISHAI	97	CLE2	$e^+e^- \approx \Upsilon(4S)$

[68] This LINK 02B result is redundant with a result in the next datablock.
[69] This BISHAI 97 result is redundant with results elsewhere in the Listings.

$\Gamma(K^+\overline{K}^0)/\Gamma(K^-\pi^+\pi^+)$ Γ_{124}/Γ_{39}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.064 ±0.005 OUR FIT Error includes scale factor of 1.3.					
0.062 ±0.004 OUR AVERAGE					
0.0604±0.0035±0.0030	949	LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma \approx 180$ GeV
0.077 ±0.014 ±0.007	70	[70] BISHAI	97	CLE2	$e^+e^- \approx \Upsilon(4S)$

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

$\Gamma(K^+K^-\pi^+)/\Gamma(K^-\pi^+\pi^+)$ Γ_{125}/Γ_{39}

VALUE	DOCUMENT ID		TECN	COMMENT
0.097 ±0.006 OUR AVERAGE				
0.093 ±0.010 $^{+0.008}_{-0.006}$	JUN	00	SELX	Σ^- nucleus, 600 GeV
0.0976±0.0042±0.0046	FRABETTI	95B	E687	Dalitz plot analysis

$\Gamma(\phi\pi^+)/\Gamma(K^-\pi^+\pi^+)$ Γ_{142}/Γ_{39}

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_{146}/Γ_{39}

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		[71] 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

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

$\Gamma(K^+K^-\pi^+$ **nonresonant**$)/\Gamma(K^-\pi^+\pi^+)$ Γ_{128}/Γ_{39}

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_{147}/Γ_{38}

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

$\Gamma(\phi\pi^+\pi^0)/\Gamma_{\text{total}}$ Γ_{143}/Γ

Unseen decay modes of the ϕ are included.

VALUE	DOCUMENT ID		TECN	COMMENT
0.023±0.010	[72] BARLAG	92C	ACCM	π^- Cu 230 GeV

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

$\Gamma(\phi\pi^+\pi^0)/\Gamma(K^-\pi^+\pi^+)$ Γ_{143}/Γ_{39}

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_{144}/Γ_{39}

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

$\Gamma(K^+K^-\pi^+\pi^0$ **non-ϕ**$)/\Gamma_{\text{total}}$ Γ_{134}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.015^{+0.007}_{-0.006}}$	[73] BARLAG	92C	ACCM	π^- Cu 230 GeV

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

$\Gamma(K^+K^-\pi^+\pi^0$ **non-ϕ**$)/\Gamma(K^-\pi^+\pi^+)$ Γ_{134}/Γ_{39}

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

$\Gamma(K^+\overline{K}^0\pi^+\pi^-)/\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)$ Γ_{135}/Γ_{57}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0562±0.0039±0.0040	469	LINK	01C	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma(K^+\overline{K}^0\pi^+\pi^-)/\Gamma_{total}$ Γ_{135}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.02	90	ALBRECHT	92B	ARG	$e^+e^-\simeq$ 10.4 GeV

$\Gamma(K^0K^-\pi^+\pi^+)/\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)$ Γ_{136}/Γ_{57}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0768±0.0041±0.0032	670	LINK	01C	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma(K^0K^-\pi^+\pi^+)/\Gamma_{total}$ Γ_{136}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.01 ±0.005±0.003	ALBRECHT	92B	ARG	$e^+e^-\simeq$ 10.4 GeV
<0.003	[74] BARLAG	92C	ACCM	π^- Cu 230 GeV

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

$\Gamma(K^*(892)^+\overline{K}^*(892)^0)/\Gamma_{total}$ Γ_{148}/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

$\Gamma(K^0K^-\pi^+\pi^+$ non-$K^{*+}\overline{K}^{*0})/\Gamma_{total}$ Γ_{138}/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_{145}/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_{145}/Γ_{39}

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

$\Gamma(\phi\pi^+\pi^+\pi^-)/\Gamma(\phi\pi^+)$ $\Gamma_{145}/\Gamma_{142}$

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_{141}/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_{149}/Γ_{39}

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	γ Be, $\overline{E}_\gamma$= 220 GeV

$\Gamma(K^+ \rho^0)/\Gamma(K^+ \pi^+ \pi^-)$ $\Gamma_{150}/\Gamma_{149}$

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_{150}/Γ_{39}

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

$\Gamma(K^*(892)^0 \pi^+)/\Gamma(K^+ \pi^+ \pi^-)$ $\Gamma_{151}/\Gamma_{149}$

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_{151}/Γ_{39}

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	γ Be, $\overline{E}_\gamma$= 220 GeV

$\Gamma(K^+ \pi^+ \pi^-$ nonresonant$)/\Gamma(K^+ \pi^+ \pi^-)$ $\Gamma_{152}/\Gamma_{149}$

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_{153}/Γ_{39}

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<0.0016	90		[75] FRABETTI	95F	E687	γ Be, $\overline{E}_\gamma \approx$ 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

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

$\Gamma(\phi K^+)/\Gamma(\phi\pi^+)$ $\Gamma_{154}/\Gamma_{142}$

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. • • •

$0.058^{+0.032}_{-0.026}\pm0.007$	4	[76] ANJOS	92D	E691	γ Be, $\overline{E}_\gamma = 145$ GeV

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

$\Gamma(\pi^+ e^+ e^-)/\Gamma_{\text{total}}$ Γ_{155}/Γ

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$<5.2\times10^{-5}$	90		AITALA	99G	E791	π^- N 500 GeV

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

$<1.1\times10^{-4}$	90		FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
$<6.6\times10^{-5}$	90		AITALA	96	E791	π^- N 500 GeV
$<2.5\times10^{-3}$	90		WEIR	90B	MRK2	e^+e^- 29 GeV
$<2.6\times10^{-3}$	90	39	HAAS	88	CLEO	e^+e^- 10 GeV

$\Gamma(\pi^+ \mu^+ \mu^-)/\Gamma_{\text{total}}$ Γ_{156}/Γ

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$<1.5\times10^{-5}$	90		AITALA	99G	E791	π^- N 500 GeV

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

$<8.9\times10^{-5}$	90		FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
$<1.8\times10^{-5}$	90		AITALA	96	E791	π^- N 500 GeV
$<2.2\times10^{-4}$	90	0	KODAMA	95	E653	π^- emulsion 600 GeV
$<5.9\times10^{-3}$	90		WEIR	90B	MRK2	e^+e^- 29 GeV
$<2.9\times10^{-3}$	90	36	HAAS	88	CLEO	e^+e^- 10 GeV

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

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$<5.6\times10^{-4}$	90	0	KODAMA	95	E653	π^- emulsion 600 GeV

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<2.0\times10^{-4}$	90	AITALA	99G	E791	π^- N 500 GeV
$<2.0\times10^{-4}$	90	FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV

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

$<4.8\times10^{-3}$	90	WEIR	90B	MRK2	e^+e^- 29 GeV

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$<4.4 \times 10^{-5}$	90		AITALA	99G	E791	π^- N 500 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<9.7 \times 10^{-5}$	90		FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
$<3.2 \times 10^{-4}$	90	0	KODAMA	95	E653	π^- emulsion 600 GeV
$<9.2 \times 10^{-3}$	90		WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

$\Gamma(\pi^+ e^\pm \mu^\mp)/\Gamma_{total}$ Γ_{160}/Γ

A test of lepton-family-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<3.4 \times 10^{-5}$	90	AITALA	99G	E791	π^- N 500 GeV

$\Gamma(\pi^+ e^+ \mu^-)/\Gamma_{total}$ Γ_{161}/Γ

A test of lepton-family-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • 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
$<3.3 \times 10^{-3}$	90	WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

$\Gamma(\pi^+ e^- \mu^+)/\Gamma_{total}$ Γ_{162}/Γ

A test of lepton-family-number conservation.

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

$\Gamma(K^+ e^\pm \mu^\mp)/\Gamma_{total}$ Γ_{163}/Γ

A test of lepton-family-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<6.8 \times 10^{-5}$	90	AITALA	99G	E791	π^- N 500 GeV

$\Gamma(K^+ e^+ \mu^-)/\Gamma_{total}$ Γ_{164}/Γ

A test of lepton-family-number conservation.

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

$\Gamma(K^+ e^- \mu^+)/\Gamma_{total}$ Γ_{165}/Γ

A test of lepton-family-number conservation.

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

$\Gamma(\pi^- e^+ e^+)/\Gamma_{total}$ Γ_{166}/Γ

A test of lepton-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<9.6 \times 10^{-5}$	90	AITALA	99G	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
$<4.8 \times 10^{-3}$	90	WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

$\Gamma(\pi^- \mu^+ \mu^+)/\Gamma_{total}$ Γ_{167}/Γ

A test of lepton-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$<1.7 \times 10^{-5}$	90		AITALA	99G	E791	π^- *N* 500 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<8.7 \times 10^{-5}$	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
$<6.8 \times 10^{-3}$	90		WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

$\Gamma(\pi^- e^+ \mu^+)/\Gamma_{total}$ Γ_{168}/Γ

A test of lepton-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<5.0 \times 10^{-5}$	90	AITALA	99G	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
$<3.7 \times 10^{-3}$	90	WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

$\Gamma(\rho^- \mu^+ \mu^+)/\Gamma_{total}$ Γ_{169}/Γ

A test of lepton-number conservation.

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

$\Gamma(K^- e^+ e^+)/\Gamma_{total}$ Γ_{170}/Γ

A test of lepton-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.2 \times 10^{-4}$	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_{171}/Γ

A test of lepton-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$<1.2 \times 10^{-4}$	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_{172}/Γ

A test of lepton-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.3 \times 10^{-4}$	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_{173}/Γ

A test of lepton-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$<8.5 \times 10^{-4}$	90	0	KODAMA	95	E653	π^- emulsion 600 GeV

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

$A_{CP}(K^0_S \pi^\pm)$ in $D^\pm \to K^0_S \pi^\pm$

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$-0.016 \pm 0.015 \pm 0.009$	10.6k	[77] LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

[77] LINK 02B measures $N(D^+ \to K^0_S \pi^+)/N(D^+ \to K^- \pi^+ \pi^+)$, the ratio of numbers of events observed, and similarly for the D^-.

$A_{CP}(K^0_S K^\pm)$ in $D^\pm \to K^0_S K^\pm$

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$+0.071 \pm 0.061 \pm 0.012$	949	[78] LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$+0.069 \pm 0.060 \pm 0.015$	949	[79] LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

[78] LINK 02B measures $N(D^+ \to K^0_S K^+)/N(D^+ \to K^0_S \pi^+)$, the ratio of numbers of events observed, and similarly for the D^-.

[79] LINK 02B measures $N(D^+ \to K^0_S K^+)/N(D^+ \to K^- \pi^+ \pi^+)$, the ratio of numbers of events observed, and similarly for the D^-.

$A_{CP}(K^+ K^- \pi^\pm)$ 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	EVTS	DOCUMENT ID		TECN	COMMENT
0.002 ± 0.011 OUR AVERAGE					
$+0.006 \pm 0.011 \pm 0.005$	14k	[80] LINK	00B	FOCS	
-0.014 ± 0.029		[80] AITALA	97B	E791	$-0.062 < A_{CP} < +0.034$ (90% CL)
-0.031 ± 0.068		[80] FRABETTI	94I	E687	$-0.14 < A_{CP} < +0.081$ (90% CL)

[80] FRABETTI 94I, AITALA 98C, and LINK 00B 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 $D^+ \to K^+\overline{K}^{*0}$, $D^- \to K^-K^{*0}$

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	[81] AITALA	97B	E791	$-0.092 < A_{CP} < +0.072$ (90% CL)
-0.12 ± 0.13	[81] FRABETTI	94I	E687	$-0.33 < A_{CP} < +0.094$ (90% CL)

[81] 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	[82] AITALA	97B	E791	$-0.087 < A_{CP} < +0.031$ (90% CL)
$+0.066 \pm 0.086$	[82] FRABETTI	94I	E687	$-0.075 < A_{CP} < +0.21$ (90% CL)

[82] 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	[83] AITALA	97B	E791	$-0.086 < A_{CP} < +0.052$ (90% CL)

[83] 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 $\pm 0.6 \pm 0.3$	[84] ADLER	88C	MRK3	e^+e^- 3.768 GeV
5.5 ± 1.0	[85] PARTRIDGE	84	CBAL	e^+e^- 3.771 GeV
$6.00 \pm 0.72 \pm 1.02$	[86] SCHINDLER	80	MRK2	e^+e^- 3.771 GeV
9.1 ± 2.0	[87] PERUZZI	77	MRK1	e^+e^- 3.774 GeV

[84] 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 $1.36 \pm 0.23 \pm 0.14$. This measurement does not include the decays of the $\psi(3770)$ not associated with charmed particle production.

[85] 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.

[86] 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.

[87] 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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.82±0.09 OUR AVERAGE					
1.45±0.23±0.07	763	ADAMOVICH	99	BEAT	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
1.90±0.11±0.09	3000	[88] AITALA	98B	E791	$\overline{K}^*(892)^0 e^+ \nu_e$
1.84±0.11±0.09	3034	AITALA	98F	E791	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
1.74±0.27±0.28	874	FRABETTI	93E	E687	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
$2.00^{+0.34}_{-0.32}\pm0.16$	305	KODAMA	92	E653	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
2.0 ±0.6 ±0.3	183	ANJOS	90E	E691	$\overline{K}^*(892)^0 e^+ \nu_e$

[88] This is slightly different from the AITALA 98B value: see ref. [5] in AITALA 98F.

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.78±0.07 OUR AVERAGE					
1.00±0.15±0.03	763	ADAMOVICH	99	BEAT	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
0.71±0.08±0.09	3000	AITALA	98B	E791	$\overline{K}^*(892)^0 e^+ \nu_e$
0.75±0.08±0.09	3034	AITALA	98F	E791	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
0.78±0.18±0.10	874	FRABETTI	93E	E687	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
$0.82^{+0.22}_{-0.23}\pm0.11$	305	KODAMA	92	E653	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
0.0 ±0.5 ±0.2	183	ANJOS	90E	E691	$\overline{K}^*(892)^0 e^+ \nu_e$

$r_3 \equiv A_3(0)/A_1(0)$ in $D^+ \to \overline{K}^*(892)^0 \ell^+ \nu_\ell$

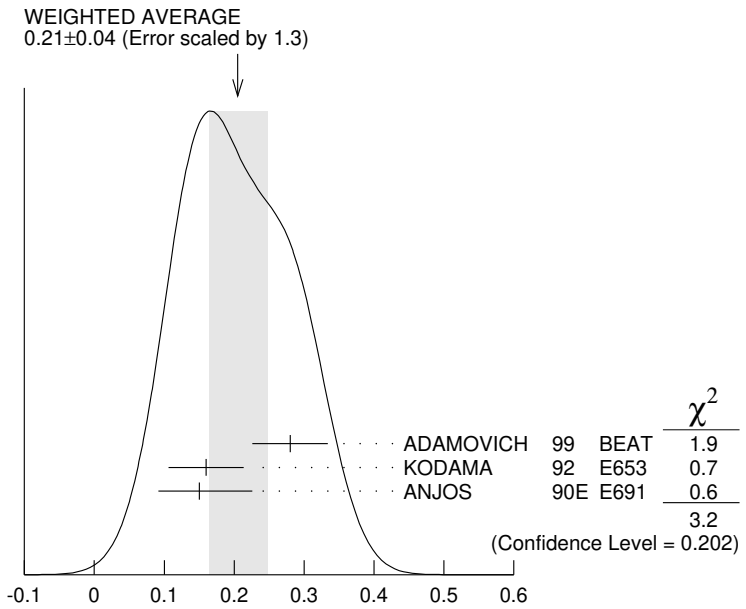
VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.04±0.33±0.29	3034	AITALA	98F	E791	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.14±0.08 OUR AVERAGE					
1.09±0.10±0.02	763	ADAMOVICH	99	BEAT	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
1.20±0.13±0.13	874	FRABETTI	93E	E687	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
1.18±0.18±0.08	305	KODAMA	92	E653	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
$1.8\ ^{+0.6}_{-0.4}\ \pm0.3$	183	ANJOS	90E	E691	$\overline{K}^*(892)^0 e^+ \nu_e$

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.21±0.04 OUR AVERAGE	Error includes scale factor of 1.3. See the ideogram below.				
$0.28 \pm 0.05 \pm 0.02$	763	ADAMOVICH	99	BEAT	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
$0.16 \pm 0.05 \pm 0.02$	305	KODAMA	92	E653	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
$0.15 \pm {}^{0.07}_{0.05} \pm 0.03$	183	ANJOS	90E	E691	$\overline{K}^*(892)^0 e^+ \nu_e$



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

$D^\pm$ REFERENCES

LINK	02B	PRL 88 041602	J.M. Link *et al.*	(FNAL FOCUS Collab.)
PDG	02	PR D66 010001	K. Hagiwara *et al.*	
AITALA	01B	PRL 86 770	E.M. Aitala *et al.*	(FNAL E791 Collab.)
LINK	01C	PRL 87 162001	J.M. Link *et al.*	(FNAL FOCUS Collab.)
ABREU	00O	EPJ C12 209	P. Abreu *et al.*	(DELPHI Collab.)
ASTIER	00D	PL B486 35	P. Astier *et al.*	(CERN NOMAD Collab.)
BAI	00C	PR D62 052001	J.Z. Bai *et al.*	(BEPC BES Collab.)
JUN	00	PRL 84 1857	S.Y. Jun *et al.*	(FNAL SELEX Collab.)
LINK	00B	PL B491 232	J.M. Link *et al.*	(FNAL FOCUS Collab.)
Also	00D	PL B495 443 (errata)	J.M. Link *et al.*	(FNAL FOCUS Collab.)
ABBIENDI	99K	EPJ C8 573	G. Abbiendi *et al.*	(OPAL Collab.)
ABE	99P	PR D60 092005	F. Abe *et al.*	(CDF Collab.)
ADAMOVICH	99	EPJ C6 35	M. Adamovich *et al.*	(CERN BEATRICE Collab.)
AITALA	99G	PL B462 401	E.M. Aitala *et al.*	(FNAL E791 Collab.)
BONVICINI	99	PRL 82 4586	G. Bonvicini *et al.*	(CLEO Collab.)
AITALA	98B	PRL 80 1393	E.M. Aitala *et al.*	(FNAL E791 Collab.)
AITALA	98C	PL B421 405	E.M. Aitala *et al.*	(FNAL E791 Collab.)
AITALA	98F	PL B440 435	E.M. Aitala *et al.*	(FNAL E791 Collab.)
BAI	98B	PL B429 188	J.Z. Bai *et al.*	(BEPC BES Collab.)
JESSOP	98	PR D58 052002	C.P. Jessop *et al.*	(CLEO Collab.)
AITALA	97	PL B397 325	E.M. Aitala *et al.*	(FNAL E791 Collab.)
AITALA	97B	PL B403 377	E.M. Aitala *et al.*	(FNAL E791 Collab.)

AITALA	97C	PL B404 187	E.M. Aitala *et al.*	(FNAL E791 Collab.)
BARTELT	97	PL B405 373	J. Bartelt *et al.*	(CLEO Collab.)
BISHAI	97	PRL 78 3261	M. Bishai *et al.*	(CLEO Collab.)
FRABETTI	97	PL B391 235	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
FRABETTI	97B	PL B398 239	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
FRABETTI	97C	PL B401 131	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
FRABETTI	97D	PL B407 79	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
AITALA	96	PRL 76 364	E.M. Aitala *et al.*	(FNAL E791 Collab.)
ALBRECHT	96C	PL B374 249	H. Albrecht *et al.*	(ARGUS Collab.)
BIGI	95	PL B349 363	I.I. Bigi, H. Yamamoto	(NDAM, HARV)
FRABETTI	95	PL B346 199	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
FRABETTI	95B	PL B351 591	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
FRABETTI	95E	PL B359 403	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
FRABETTI	95F	PL B363 259	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
KODAMA	95	PL B345 85	K. Kodama *et al.*	(FNAL E653 Collab.)
ALBRECHT	94I	ZPHY C64 375	H. Albrecht *et al.*	(ARGUS Collab.)
ALEEV	94	PAN 57 1370 Translated from YF 57 1443.	A.N. Aleev *et al.*	(Serpukhov BIS-2 Collab.)
BALEST	94	PRL 72 2328	R. Balest *et al.*	(CLEO Collab.)
FRABETTI	94D	PL B323 459	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
FRABETTI	94G	PL B331 217	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
FRABETTI	94I	PR D50 R2953	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
ABE	93E	PL B313 288	K. Abe *et al.*	(VENUS Collab.)
ADAMOVICH	93	PL B305 177	M.I. Adamovich *et al.*	(CERN WA82 Collab.)
AKERIB	93	PRL 71 3070	D.S. Akerib *et al.*	(CLEO Collab.)
ALAM	93	PRL 71 1311	M.S. Alam *et al.*	(CLEO Collab.)
ANJOS	93	PR D48 56	J.C. Anjos *et al.*	(FNAL E691 Collab.)
BEAN	93C	PL B317 647	A. Bean *et al.*	(CLEO Collab.)
FRABETTI	93E	PL B307 262	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
KODAMA	93B	PL B313 260	K. Kodama *et al.*	(FNAL E653 Collab.)
KODAMA	93C	PL B316 455	K. Kodama *et al.*	(FNAL E653 Collab.)
SELEN	93	PRL 71 1973	M.A. Selen *et al.*	(CLEO Collab.)
ALBRECHT	92B	ZPHY C53 361	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	92F	PL B278 202	H. Albrecht *et al.*	(ARGUS Collab.)
ANJOS	92	PR D45 R2177	J.C. Anjos *et al.*	(FNAL E691 Collab.)
ANJOS	92C	PR D46 1941	J.C. Anjos *et al.*	(FNAL E691 Collab.)
ANJOS	92D	PRL 69 2892	J.C. Anjos *et al.*	(FNAL E691 Collab.)
BARLAG	92C	ZPHY C55 383	S. Barlag *et al.*	(ACCMOR Collab.)
Also	90D	ZPHY C48 29	S. Barlag *et al.*	(ACCMOR Collab.)
COFFMAN	92B	PR D45 2196	D.M. Coffman *et al.*	(Mark III Collab.)
DAOUDI	92	PR D45 3965	M. Daoudi *et al.*	(CLEO Collab.)
FRABETTI	92	PL B281 167	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
KODAMA	92	PL B274 246	K. Kodama *et al.*	(FNAL E653 Collab.)
KODAMA	92C	PL B286 187	K. Kodama *et al.*	(FNAL E653 Collab.)
ADAMOVICH	91	PL B268 142	M.I. Adamovich *et al.*	(WA82 Collab.)
ALBRECHT	91	PL B255 634	H. Albrecht *et al.*	(ARGUS Collab.)
ALVAREZ	91	PL B255 639	M.P. Alvarez *et al.*	(CERN NA14/2 Collab.)
ALVAREZ	91B	ZPHY C50 11	M.P. Alvarez *et al.*	(CERN NA14/2 Collab.)
AMMAR	91	PR D44 3383	R. Ammar *et al.*	(CLEO Collab.)
ANJOS	91B	PR D43 R2063	J.C. Anjos *et al.*	(FNAL E691 Collab.)
ANJOS	91C	PRL 67 1507	J.C. Anjos *et al.*	(FNAL-TPS Collab.)
BAI	91	PRL 66 1011	Z. Bai *et al.*	(Mark III Collab.)
COFFMAN	91	PL B263 135	D.M. Coffman *et al.*	(Mark III Collab.)
FRABETTI	91	PL B263 584	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
ALVAREZ	90	ZPHY C47 539	M.P. Alvarez *et al.*	(CERN NA14/2 Collab.)
ALVAREZ	90C	PL B246 261	M.P. Alvarez *et al.*	(CERN NA14/2 Collab.)
ANJOS	90C	PR D41 2705	J.C. Anjos *et al.*	(FNAL E691 Collab.)
ANJOS	90D	PR D42 2414	J.C. Anjos *et al.*	(FNAL E691 Collab.)
ANJOS	90E	PRL 65 2630	J.C. Anjos *et al.*	(FNAL E691 Collab.)
BARLAG	90C	ZPHY C46 563	S. Barlag *et al.*	(ACCMOR Collab.)
WEIR	90B	PR D41 1384	A.J. Weir *et al.*	(Mark II Collab.)
ANJOS	89	PRL 62 125	J.C. Anjos *et al.*	(FNAL E691 Collab.)
ANJOS	89B	PRL 62 722	J.C. Anjos *et al.*	(FNAL E691 Collab.)
ANJOS	89E	PL B223 267	J.C. Anjos *et al.*	(FNAL E691 Collab.)
ADLER	88B	PRL 60 1375	J. Adler *et al.*	(Mark III Collab.)
ADLER	88C	PRL 60 89	J. Adler *et al.*	(Mark III Collab.)
ALBRECHT	88I	PL B210 267	H. Albrecht *et al.*	(ARGUS Collab.)
ANJOS	88	PRL 60 897	J.C. Anjos *et al.*	(FNAL E691 Collab.)
AOKI	88	PL B209 113	S. Aoki *et al.*	(WA75 Collab.)
HAAS	88	PRL 60 1614	P. Haas *et al.*	(CLEO Collab.)
ONG	88	PRL 60 2587	R.A. Ong *et al.*	(Mark II Collab.)

RAAB	88	PR D37 2391	J.R. Raab *et al.*	(FNAL E691 Collab.)
ADAMOVICH	87	EPL 4 887	M.I. Adamovich *et al.*	(Photon Emulsion Collab.)
ADLER	87	PL B196 107	J. Adler *et al.*	(Mark III Collab.)
AGUILAR-...	87E	ZPHY C36 551	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
Also	88B	ZPHY C40 321	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
AGUILAR-...	87F	ZPHY C36 559	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
Also	88	ZPHY C38 520 erratum	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
BARTEL	87	ZPHY C33 339	W. Bartel *et al.*	(JADE Collab.)
AGUILAR-...	86B	ZPHY C31 491	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
BALTRUSAIT...	86E	PRL 56 2140	R.M. Baltrusaitis *et al.*	(Mark III Collab.)
PAL	86	PR D33 2708	T. Pal *et al.*	(DELCO Collab.)
AIHARA	85	ZPHY C27 39	H. Aihara *et al.*	(TPC Collab.)
BALTRUSAIT...	85B	PRL 54 1976	R.M. Baltrusaitis *et al.*	(Mark III Collab.)
BALTRUSAIT...	85E	PRL 55 150	R.M. Baltrusaitis *et al.*	(Mark III Collab.)
BARTEL	85J	PL 163B 277	W. Bartel *et al.*	(JADE Collab.)
ADAMOVICH	84	PL 140B 119	M.I. Adamovich *et al.*	(CERN WA58 Collab.)
ALTHOFF	84G	ZPHY C22 219	M. Althoff *et al.*	(TASSO Collab.)
ALTHOFF	84J	PL 146B 443	M. Althoff *et al.*	(TASSO Collab.)
DERRICK	84	PRL 53 1971	M. Derrick *et al.*	(HRS Collab.)
KOOP	84	PRL 52 970	D.E. Koop *et al.*	(DELCO Collab.)
PARTRIDGE	84	Thesis CALT-68-1150	R.A. Partridge	(Crystal Ball Collab.)
AGUILAR-...	83B	PL 123B 98	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
AUBERT	83	NP B213 31	J.J. Aubert *et al.*	(EMC Collab.)
PARTRIDGE	81	PRL 47 760	R. Partridge *et al.*	(Crystal Ball Collab.)
SCHINDLER	81	PR D24 78	R.H. Schindler *et al.*	(Mark II Collab.)
TRILLING	81	PRPL 75 57	G.H. Trilling	(LBL, UCB) J
BACINO	80	PRL 45 329	W.J. Bacino *et al.*	(DELCO Collab.)
SCHINDLER	80	PR D21 2716	R.H. Schindler *et al.*	(Mark II Collab.)
ZHOLENTZ	80	PL 96B 214	A.A. Zholents *et al.*	(NOVO)
Also	81	SJNP 34 814 Translated from YAF 34 1471.	A.A. Zholents *et al.*	(NOVO)
BACINO	79	PRL 43 1073	W.J. Bacino *et al.*	(DELCO Collab.)
BRANDELIK	79	PL 80B 412	R. Brandelik *et al.*	(DASP Collab.)
FELLER	78	PRL 40 274	J.M. Feller *et al.*	(Mark I Collab.)
VUILLEMIN	78	PRL 41 1149	V. Vuillemin *et al.*	(Mark I Collab.)
GOLDHABER	77	PL 69B 503	G. Goldhaber *et al.*	(Mark I Collab.)
PERUZZI	77	PRL 39 1301	I. Peruzzi *et al.*	(Mark I Collab.)
PICCOLO	77	PL 70B 260	M. Piccolo *et al.*	(Mark I Collab.)
RAPIDIS	77	PRL 39 526	P.A. Rapidis *et al.*	(Mark I Collab.)
PERUZZI	76	PRL 37 569	I. Peruzzi *et al.*	(Mark I Collab.)

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