$D^{\pm}$

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

$D^{\pm}$ 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*
1869.62± 0.20 OUR FIT Error includes scale factor of 1.1.					
1869.5 ± 0.5 OUR AVERAGE					
1870.0 ± 0.5 ±1.0	317	BARLAG	90C	ACCM	π^- Cu 230 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
1863 ± 4		DERRICK	84	HRS	e^+e^- 29 GeV
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*
1040 ± 7 OUR AVERAGE					
1039.4± 4.3± 7.0	110k	LINK	02F	FOCS	γ nucleus, $\approx$ 180 GeV
$1033.6\pm22.1^{+\ 9.9}_{-12.7}$	3777	BONVICINI	99	CLE2	$e^+e^- \approx \Upsilon(4S)$
1048 ±15 ±11	9k	FRABETTI	94D	E687	$D^+ \to K^-\pi^+\pi^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
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

Most decay modes (other than the semileptonic modes) that involve a neutral K meson are now given as K^0_S modes, not as $\overline{K}^0$ modes. Nearly always it is a K^0_S that is measured, and interference between Cabibbo-allowed and doubly Cabibbo-suppressed modes can invalidate the assumption that $2\,\Gamma(K^0_S) = \Gamma(\overline{K}^0)$.

	Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
	Inclusive modes		
Γ_1	e^+ anything	$(16.1\ \pm0.4\ )\ \%$	
Γ_2	μ^+ anything		
Γ_3	K^- anything	$(27.5\ \pm2.4\ )\ \%$	
Γ_4	$\overline{K}^0$ anything $+\ K^0$ anything	$(61\ \pm5\ )\ \%$	
Γ_5	K^+ anything	$(\ 5.5\ \pm1.6\ )\ \%$	
Γ_6	$K^*(892)^-$ anything	$(\ 6\ \pm5\ )\ \%$	
Γ_7	$\overline{K}^*(892)^0$ anything	$(23\ \pm5\ )\ \%$	
Γ_8	$K^*(892)^+$ anything	$< 20.3\ \%$	CL=90%
Γ_9	$K^*(892)^0$ anything	$<\ 6.6\ \%$	CL=90%
Γ_{10}	η anything	$(\ 6.3\ \pm0.7\ )\ \%$	
Γ_{11}	η' anything	$(\ 1.04\pm0.18)\ \%$	
Γ_{12}	ϕ anything	$(\ 1.03\pm0.12)\ \%$	
Γ_{13}	$\phi\, e^+$ anything		
	Leptonic and semileptonic modes		
Γ_{14}	$e^+\nu_e$	$<\ 2.4\ \times 10^{-5}$	CL=90%
Γ_{15}	$\mu^+\nu_\mu$	$(\ 4.4\ \pm0.7\ )\times 10^{-4}$	
Γ_{16}	$\tau^+\nu_\tau$	$<\ 2.1\ \times 10^{-3}$	
Γ_{17}	$\overline{K}^0\,\ell^+\nu_\ell$	[a]	
Γ_{18}	$\overline{K}^0\,e^+\nu_e$	$(\ 8.6\ \pm0.5\ )\ \%$	
Γ_{19}	$\overline{K}^0\,\mu^+\nu_\mu$	$(\ 9.6\ \pm0.8\ )\ \%$	S=1.1
Γ_{20}	$K^-\pi^+e^+\nu_e$	$(\ 4.1\ \pm0.6\ )\ \%$	S=1.1
Γ_{21}	$\overline{K}^*(892)^0 e^+\nu_e$, $\overline{K}^*(892)^0 \to K^-\pi^+$	$(\ 3.71\pm0.21)\ \%$	
Γ_{22}	$K^-\pi^+e^+\nu_e$ nonresonant	$<\ 7\ \times 10^{-3}$	CL=90%
Γ_{23}	$K^-\pi^+\mu^+\nu_\mu$	$(\ 4.0\ \pm0.5\ )\ \%$	
Γ_{24}	$\overline{K}^*(892)^0\mu^+\nu_\mu$, $\overline{K}^*(892)^0 \to K^-\pi^+$	$(\ 3.7\ \pm0.3\ )\ \%$	
Γ_{25}	$K^-\pi^+\mu^+\nu_\mu$ nonresonant	$(\ 2.1\ \pm0.6\ )\times 10^{-3}$	
Γ_{26}	$(\overline{K}^*(892)\pi)^0 e^+\nu_e$	$<\ 1.2\ \%$	CL=90%
Γ_{27}	$(\overline{K}\pi\pi)^0 e^+\nu_e$ non-$\overline{K}^*(892)$	$<\ 9\ \times 10^{-3}$	CL=90%
Γ_{28}	$K^-\pi^+\pi^0\mu^+\nu_\mu$	$<\ 1.7\ \times 10^{-3}$	CL=90%
Γ_{29}	$\pi^0 e^+\nu_e$	$(\ 4.4\ \pm0.7\ )\times 10^{-3}$	

Γ_{30}	$\pi^0 \ell^+ \nu_\ell$	[a]		
Γ_{31}	$\rho^0 e^+ \nu_e$		$(2.2 \pm 0.4) \times 10^{-3}$	
Γ_{32}	$\rho^0 \mu^+ \nu_\mu$		$(2.5 \pm 0.5) \times 10^{-3}$	
Γ_{33}	$\omega e^+ \nu_e$		$(1.6 \ ^{+0.7}_{-0.6}) \times 10^{-3}$	
Γ_{34}	$\phi e^+ \nu_e$		< 2.01 %	CL=90%
Γ_{35}	$\phi \mu^+ \nu_\mu$		< 2.04 %	CL=90%
Γ_{36}	$\eta \ell^+ \nu_\ell$		$< 7 \times 10^{-3}$	CL=90%
Γ_{37}	$\eta'(958) \mu^+ \nu_\mu$		< 1.1 %	CL=90%

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

Γ_{38}	$\overline{K}^*(892)^0 e^+ \nu_e$		(5.56 ± 0.32) %	S=1.2
Γ_{39}	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$		(5.5 ± 0.5) %	S=1.1
Γ_{40}	$\overline{K}_1(1270)^0 \mu^+ \nu_\mu$		< 4 %	CL=95%
Γ_{41}	$\overline{K}^*(1410)^0 \mu^+ \nu_\mu$			
Γ_{42}	$\overline{K}_0^*(1430)^0 \mu^+ \nu_\mu$		$< 2.5 \times 10^{-4}$	
Γ_{43}	$\overline{K}_2^*(1430)^0 \mu^+ \nu_\mu$		< 1.1 %	CL=95%
Γ_{44}	$\overline{K}^*(1680)^0 \mu^+ \nu_\mu$		$< 1.6 \times 10^{-3}$	

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

Γ_{45}	$K_S^0 \pi^+$		(1.47 ± 0.06) %	S=1.1
Γ_{46}	$K^- \pi^+ \pi^+$	[b]	(9.51 ± 0.34) %	S=1.1
Γ_{47}	$(K^- \pi^+)_{S-\text{wave}} \pi^+$		(7.47 ± 0.34) %	
Γ_{48}	$\overline{K}_0^*(800)^0 \pi^+$, $\overline{K}_0^*(800) \to K^- \pi^+$	[c]		
Γ_{49}	$\overline{K}^*(892)^0 \pi^+$, $\overline{K}^*(892)^0 \to K^- \pi^+$	[c]	(1.13 ± 0.20) %	
Γ_{50}	$\overline{K}_0^*(1430)^0 \pi^+$, $\overline{K}_0^*(1430)^0 \to K^- \pi^+$	[c]		
Γ_{51}	$\overline{K}_2^*(1430)^0 \pi^+$, $\overline{K}_2^*(1430)^0 \to K^- \pi^+$	[c]	$(1.9 \pm 1.3) \times 10^{-4}$	
Γ_{52}	$\overline{K}^*(1680)^0 \pi^+$, $\overline{K}^*(1680)^0 \to K^- \pi^+$	[c]	$(1.1 \pm 1.3) \times 10^{-3}$	
Γ_{53}	$K^- \pi^+ \pi^+$ nonresonant	[c]		
Γ_{54}	$K_S^0 \pi^+ \pi^0$	[b]	(7.0 ± 0.5) %	S=1.3
Γ_{55}	$K_S^0 \rho^+$		(4.7 ± 1.1) %	
Γ_{56}	$\overline{K}^*(892)^0 \pi^+$, $\overline{K}^*(892)^0 \to K_S^0 \pi^0$		(1.3 ± 0.6) %	
Γ_{57}	$K_S^0 \pi^+ \pi^0$ nonresonant		$(9 \pm 7) \times 10^{-3}$	
Γ_{58}	$K^- \pi^+ \pi^+ \pi^0$	[b]	(6.00 ± 0.28) %	S=1.1
Γ_{59}	$\overline{K}^*(892)^0 \rho^+$ total, $\overline{K}^*(892)^0 \to K^- \pi^+$		(1.3 ± 0.8) %	

Γ_{60}	$\overline{K}_1(1400)^0\pi^+$, $\overline{K}_1(1400)^0 \to K^-\pi^+\pi^0$		(1.8 ± 0.7) %	
Γ_{61}	$K^-\rho^+\pi^+$ total		(2.9 ± 1.0) %	
Γ_{62}	$K^-\rho^+\pi^+$ 3-body		(1.0 ± 0.4) %	
Γ_{63}	$\overline{K}^*(892)^0\pi^+\pi^0$ total, $\overline{K}^*(892)^0 \to K^-\pi^+$		(4.2 ± 0.6) %	
Γ_{64}	$\overline{K}^*(892)^0\pi^+\pi^0$ 3-body, $\overline{K}^*(892)^0 \to K^-\pi^+$		(2.7 ± 0.8) %	
Γ_{65}	$K^*(892)^-\pi^+\pi^+$ 3-body, $K^*(892)^- \to K^-\pi^0$		$(6 \pm 3) \times 10^{-3}$	
Γ_{66}	$K^-\pi^+\pi^+\pi^0$ nonresonant	[d]	(1.1 ± 0.5) %	
Γ_{67}	$K^0_S\pi^+\pi^+\pi^-$	[b]	(3.10 ± 0.22) %	S=1.1
Γ_{68}	$K^0_S a_1(1260)^+$, $a_1(1260)^+ \to \pi^+\pi^+\pi^-$		(1.8 ± 0.3) %	
Γ_{69}	$\overline{K}_1(1400)^0\pi^+$, $\overline{K}_1(1400)^0 \to K^0_S\pi^+\pi^-$		(1.8 ± 0.7) %	
Γ_{70}	$K^*(892)^-\pi^+\pi^+$ 3-body, $K^*(892)^- \to K^0_S\pi^-$		(1.3 ± 0.6) %	
Γ_{71}	$K^0_S\rho^0\pi^+$ total		(1.86 ± 0.34) %	CL=90%
Γ_{72}	$K^0_S\rho^0\pi^+$ 3-body		$(2.2 \pm 2.2) \times 10^{-3}$	
Γ_{73}	$K^0_S\pi^+\pi^+\pi^-$ nonresonant		$(3.7 \pm 1.9) \times 10^{-3}$	
Γ_{74}	$K^-3\pi^+\pi^-$	[b]	$(5.8 \pm 0.6) \times 10^{-3}$	S=1.1
Γ_{75}	$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$, $\overline{K}^*(892)^0 \to K^-\pi^+$		$(1.2 \pm 0.4) \times 10^{-3}$	
Γ_{76}	$\overline{K}^*(892)^0\rho^0\pi^+$, $\overline{K}^*(892)^0 \to K^-\pi^+$		$(2.3 \pm 0.4) \times 10^{-3}$	
Γ_{77}	$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$ no-ρ, $\overline{K}^*(892)^0 \to K^-\pi^+$			
Γ_{78}	$K^-\rho^0\pi^+\pi^+$		$(1.75 \pm 0.29) \times 10^{-3}$	
Γ_{79}	$K^-3\pi^+\pi^-$ nonresonant		$(4.1 \pm 3.0) \times 10^{-4}$	
Γ_{80}	$K^+2K^0_S$		$(4.6 \pm 2.1) \times 10^{-3}$	
Γ_{81}	$K^+K^-K^0_S\pi^+$		$(2.4 \pm 0.6) \times 10^{-4}$	

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

Γ_{82}	$K^0_S a_1(1260)^+$		(3.6 ± 0.6) %	
Γ_{83}	$K^0_S a_2(1320)^+$		$< 1.5 \times 10^{-3}$	CL=90%
Γ_{84}	$\overline{K}^*(892)^0\rho^+$ total	[d]	(2.0 ± 1.2) %	
Γ_{85}	$\overline{K}^*(892)^0\rho^+$ *S*-wave	[d]	(1.5 ± 1.5) %	
Γ_{86}	$\overline{K}^*(892)^0\rho^+$ *P*-wave		$< 1 \times 10^{-3}$	CL=90%
Γ_{87}	$\overline{K}^*(892)^0\rho^+$ *D*-wave		$(9 \pm 6) \times 10^{-3}$	
Γ_{88}	$\overline{K}^*(892)^0\rho^+$ *D*-wave longitudinal		$< 7 \times 10^{-3}$	CL=90%
Γ_{89}	$\overline{K}_1(1270)^0\pi^+$		$< 7 \times 10^{-3}$	CL=90%

Γ_{90}	$\overline{K}_1(1400)^0\pi^+$		(5.4 ± 1.7) %	
Γ_{91}	$\overline{K}^*(1410)^0\pi^+$			
Γ_{92}	$\overline{K}^*(892)^0\pi^+\pi^0$ total		(6.3 ± 0.9) %	
Γ_{93}	$\overline{K}^*(892)^0\pi^+\pi^0$ 3-body	[d]	(4.0 ± 1.2) %	
Γ_{94}	$K^*(892)^-\pi^+\pi^+$ total		—	
Γ_{95}	$K^*(892)^-\pi^+\pi^+$ 3-body		(1.4 ± 0.9) %	
Γ_{96}	$K^0_S f_0(980)\pi^+$			
Γ_{97}	$\overline{K}^*(892)^0 a_1(1260)^+$		$(9.4 \pm 1.9) \times 10^{-3}$	

Pionic modes

Γ_{98}	$\pi^+\pi^0$		$(1.28\pm0.08) \times 10^{-3}$	
Γ_{99}	$\pi^+\pi^+\pi^-$		$(3.31\pm0.21) \times 10^{-3}$	
Γ_{100}	$\rho^0\pi^+$		$(1.07\pm0.11) \times 10^{-3}$	
Γ_{101}	$\pi^+(\pi^+\pi^-)_{S-\text{wave}}$		$(1.85\pm0.18) \times 10^{-3}$	
Γ_{102}	$\sigma\pi^+$, $\sigma \to \pi^+\pi^-$		$(1.53\pm0.32) \times 10^{-3}$	
Γ_{103}	$f_0(980)\pi^+$, $f_0(980) \to \pi^+\pi^-$		$(2.1 \pm 0.5) \times 10^{-4}$	
Γ_{104}	$f_0(1370)\pi^+$, $f_0(1370) \to \pi^+\pi^-$		$(8 \pm 6) \times 10^{-5}$	
Γ_{105}	$f_2(1270)\pi^+$, $f_2(1270) \to \pi^+\pi^-$		$(4.8 \pm 1.3) \times 10^{-4}$	
Γ_{106}	$\rho(1450)^0\pi^+$, $\rho(1450)^0 \to \pi^+\pi^-$			
Γ_{107}	$\pi^+\pi^+\pi^-$ nonresonant			
Γ_{108}	$\pi^+ 2\pi^0$		$(4.8 \pm 0.4) \times 10^{-3}$	
Γ_{109}	$\pi^+\pi^+\pi^-\pi^0$		(1.18 ± 0.09) %	
Γ_{110}	$\eta\pi^+$, $\eta \to \pi^+\pi^-\pi^0$		$(7.9 \pm 0.7) \times 10^{-4}$	
Γ_{111}	$\omega\pi^+$, $\omega \to \pi^+\pi^-\pi^0$		$< 3 \times 10^{-4}$	CL=90%
Γ_{112}	$3\pi^+ 2\pi^-$		$(1.68\pm0.17) \times 10^{-3}$	S=1.1
Γ_{113}	$3\pi^+ 2\pi^-\pi^0$			

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

Γ_{114}	$\eta\pi^+$		$(3.50\pm0.32) \times 10^{-3}$	
Γ_{115}	$\omega\pi^+$		$< 3.4 \times 10^{-4}$	CL=90%
Γ_{116}	$\eta\rho^+$		$< 7 \times 10^{-3}$	CL=90%
Γ_{117}	$\eta'(958)\pi^+$		$(5.3 \pm 1.1) \times 10^{-3}$	
Γ_{118}	$\eta'(958)\rho^+$		$< 6 \times 10^{-3}$	CL=90%

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

Γ_{119}	$K^+ K^0_S$		$(2.95\pm0.19) \times 10^{-3}$	S=1.1
Γ_{120}	$K^+ K^-\pi^+$	[b]	(1.00 ± 0.04) %	S=1.2
Γ_{121}	$\phi\pi^+$, $\phi \to K^+K^-$		$(3.2 \pm 0.4) \times 10^{-3}$	
Γ_{122}	$K^+\overline{K}^*(892)^0$, $\overline{K}^*(892)^0 \to K^-\pi^+$		$(3.01\pm0.35) \times 10^{-3}$	

Γ_{123}	$K^+ \overline{K}^*_0(1430)^0$, $\overline{K}^*_0(1430)^0 \to K^- \pi^+$	$(3.7 \pm 0.4) \times 10^{-3}$	
Γ_{124}	$K^+ K^- \pi^+$ nonresonant		
Γ_{125}	$K^0_S K^0_S \pi^+$	—	
Γ_{126}	$K^*(892)^+ K^0_S$, $K^*(892)^+ \to K^0_S \pi^+$	$(5.3 \pm 2.3) \times 10^{-3}$	
Γ_{127}	$K^+ K^- \pi^+ \pi^0$	—	
Γ_{128}	$\phi \pi^+ \pi^0$, $\phi \to K^+ K^-$	(1.1 ± 0.5) %	
Γ_{129}	$\phi \rho^+$, $\phi \to K^+ K^-$	$< 7 \times 10^{-3}$	CL=90%
Γ_{130}	$K^+ K^- \pi^+ \pi^0$ non-ϕ	$(1.5 {}^{+0.7}_{-0.6})$ %	
Γ_{131}	$K^+ K^0_S \pi^+ \pi^-$	$(1.74 \pm 0.21) \times 10^{-3}$	
Γ_{132}	$K^0_S K^- \pi^+ \pi^+$	$(2.38 \pm 0.23) \times 10^{-3}$	
Γ_{133}	$K^*(892)^+ \overline{K}^*(892)^0$, $K^{*+} \to K^0_S \pi^+$, $\overline{K}^{*0} \to K^- \pi^+$	$(5.8 \pm 2.4) \times 10^{-3}$	
Γ_{134}	$K^0_S K^- \pi^+ \pi^+$ (non-$K^{*+} \overline{K}^{*0}$)	$< 4 \times 10^{-3}$	CL=90%
Γ_{135}	$K^+ K^- \pi^+ \pi^+ \pi^-$	$(2.3 \pm 1.2) \times 10^{-4}$	

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

Γ_{136}	$\phi \pi^+$	$(6.5 \pm 0.7) \times 10^{-3}$	
Γ_{137}	$\phi \pi^+ \pi^0$	(2.3 ± 1.0) %	
Γ_{138}	$\phi \rho^+$	< 1.5 %	CL=90%
Γ_{139}	$K^+ \overline{K}^*(892)^0$		
Γ_{140}	$K^*(892)^+ K^0_S$	(1.6 ± 0.7) %	
Γ_{141}	$K^*(892)^+ \overline{K}^*(892)^0$	(2.6 ± 1.1) %	

Doubly Cabibbo-suppressed modes

Γ_{142}	$K^+ \pi^0$	$(2.37 \pm 0.32) \times 10^{-4}$	
Γ_{143}	$K^+ \pi^+ \pi^-$	$(6.4 \pm 0.8) \times 10^{-4}$	
Γ_{144}	$K^+ \rho^0$	$(2.5 \pm 0.7) \times 10^{-4}$	
Γ_{145}	$K^*(892)^0 \pi^+$, $K^*(892)^0 \to K^+ \pi^-$	$(3.0 \pm 0.6) \times 10^{-4}$	
Γ_{146}	$K^+ f_0(980)$, $f_0(980) \to \pi^+ \pi^-$	$(5.7 \pm 3.5) \times 10^{-5}$	
Γ_{147}	$K^*_2(1430)^0 \pi^+$, $K^*_2(1430)^0 \to K^+ \pi^-$	$(5.2 \pm 3.5) \times 10^{-5}$	
Γ_{148}	$K^+ \pi^+ \pi^-$ nonresonant		
Γ_{149}	$K^+ K^+ K^-$	$(9.0 \pm 2.1) \times 10^{-5}$	
Γ_{150}	ϕK^+		

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

Γ_{151}	$\pi^+ e^+ e^-$	$C1$		< 7.4	$\times 10^{-6}$	CL=90%
Γ_{152}	$\pi^+ \phi$, $\phi \to e^+ e^-$		[e]	$(2.7\ ^{+3.6}_{-1.8})$	$\times 10^{-6}$	
Γ_{153}	$\pi^+ \mu^+ \mu^-$	$C1$		< 8.8	$\times 10^{-6}$	CL=90%
Γ_{154}	$\rho^+ \mu^+ \mu^-$	$C1$		< 5.6	$\times 10^{-4}$	CL=90%
Γ_{155}	$K^+ e^+ e^-$		[f]	< 6.2	$\times 10^{-6}$	CL=90%
Γ_{156}	$K^+ \mu^+ \mu^-$		[f]	< 9.2	$\times 10^{-6}$	CL=90%
Γ_{157}	$\pi^+ e^\pm \mu^\mp$	LF	[g]	< 3.4	$\times 10^{-5}$	CL=90%
Γ_{158}	$\pi^+ e^+ \mu^-$					
Γ_{159}	$\pi^+ e^- \mu^+$					
Γ_{160}	$K^+ e^\pm \mu^\mp$	LF	[g]	< 6.8	$\times 10^{-5}$	CL=90%
Γ_{161}	$K^+ e^+ \mu^-$					
Γ_{162}	$K^+ e^- \mu^+$					
Γ_{163}	$\pi^- e^+ e^+$	L		< 3.6	$\times 10^{-6}$	CL=90%
Γ_{164}	$\pi^- \mu^+ \mu^+$	L		< 4.8	$\times 10^{-6}$	CL=90%
Γ_{165}	$\pi^- e^+ \mu^+$	L		< 5.0	$\times 10^{-5}$	CL=90%
Γ_{166}	$\rho^- \mu^+ \mu^+$	L		< 5.6	$\times 10^{-4}$	CL=90%
Γ_{167}	$K^- e^+ e^+$	L		< 4.5	$\times 10^{-6}$	CL=90%
Γ_{168}	$K^- \mu^+ \mu^+$	L		< 1.3	$\times 10^{-5}$	CL=90%
Γ_{169}	$K^- e^+ \mu^+$	L		< 1.3	$\times 10^{-4}$	CL=90%
Γ_{170}	$K^*(892)^- \mu^+ \mu^+$	L		< 8.5	$\times 10^{-4}$	CL=90%

Γ_{171}	A dummy mode used by the fit.	(36.0 ± 2.2) %	S=1.1

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

[b] 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.

[c] These subfractions of the $K^- \pi^+ \pi^+$ mode are uncertain: see the Particle Listings.

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

[e] This is *not* a test for the ΔC=1 weak neutral current, but leads to the $\pi^+ e^+ e^-$ final state.

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

[g] 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 51 measurements and one constraint to determine 19 parameters. The overall fit has a $\chi^2 = 30.6$ for 33 degrees of freedom.

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

	x_{18}	x_{19}	x_{20}	x_{31}	x_{38}	x_{39}	x_{45}	x_{46}	x_{54}	x_{58}
x_{19}	3									
x_{20}	0	0								
x_{31}	0	0	0							
x_{38}	1	4	8	5						
x_{39}	3	61	0	0	4					
x_{45}	9	34	1	0	9	34				
x_{46}	8	40	1	1	11	40	84			
x_{54}	4	15	0	0	4	15	47	38		
x_{58}	5	26	1	0	7	27	56	66	33	
x_{67}	6	25	1	0	6	25	67	61	60	41
x_{74}	3	15	0	0	4	15	31	37	14	25
x_{112}	3	14	0	0	4	14	29	35	13	23
x_{114}	3	16	0	0	4	16	33	39	14	26
x_{119}	5	21	0	0	6	21	53	53	25	35
x_{120}	6	33	1	0	9	33	68	82	23	59
x_{121}	2	12	0	0	3	12	25	31	10	21
x_{136}	2	12	0	0	3	12	25	30	10	21
x_{171}	−28	−71	−27	−3	−24	−65	−68	−73	−52	−57

	x_{67}	x_{74}	x_{112}	x_{114}	x_{119}	x_{120}	x_{121}	x_{136}
x_{74}	23							
x_{112}	21	78						
x_{114}	24	15	13					
x_{119}	37	20	18	20				
x_{120}	46	31	28	35	43			
x_{121}	18	11	11	43	16	32		
x_{136}	18	11	11	43	16	32	99	
x_{171}	−60	−30	−28	−31	−41	−60	−27	−27

D^+ BRANCHING RATIOS

Some now-obsolete measurements have been omitted from these Listings.

——— c-quark decays ———

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

For the Summary Table, we only use the average of e^+ and μ^+ measurements from $Z^0 \to c\overline{c}$ decays; see the second data block 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 $Z^0 \to c\overline{c}$.

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

For the Summary Table, we only use the average of e^+ and μ^+ measurements from $Z^0 \to c\overline{c}$ decays; see the next data block.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.082±0.005 OUR AVERAGE					
$0.073 \pm 0.008 \pm 0.002$	73	KAYIS-TOPAK...	05	CHRS	ν_μ emulsion
$0.095 \pm 0.007 {}^{+0.014}_{-0.013}$	2829	ASTIER	00D	NOMD	$\nu_\mu \text{Fe} \to \mu^- \mu^+ X$
$0.090 \pm 0.007 {}^{+0.007}_{-0.006}$	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. • • •					
$0.093 \pm 0.009 \pm 0.009$	88	KAYIS-TOPAK...	02	CHRS	See KAYIS-TOPAKSU 05
$0.089 \pm 0.018 \pm 0.025$		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	00O	DLPH	$Z^0 \to c\overline{c}$

[8] ABREU 00O 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
0.1613±0.0020±0.0033	8798 ± 105	[9] ADAM	06A	CLEO	e^+e^- at $\psi(3770)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.20\ ^{+0.09}_{-0.07}$		AGUILAR-...	87E	HYBR	$\pi p, pp$ 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
$0.220\ ^{+0.044}_{-0.022}$		BACINO	80	DLCO	e^+e^- 3.77 GeV

[9] Using the D^+ and D^0 lifetimes, ADAM 06A finds that the ratio of the D^+ and D^0 inclusive e^+ widths is 0.985 ± 0.028 ± 0.015, consistent with the isospin-invariance prediction of 1.

$\Gamma(K^- \text{anything})/\Gamma_{\text{total}}$ Γ_3/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.275±0.024 OUR AVERAGE					
$0.278\ ^{+0.036}_{-0.031}$		BARLAG	92C	ACCM	π^- Cu 230 GeV
0.271±0.023±0.024		COFFMAN	91	MRK3	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.17 ±0.07		AGUILAR-...	87E	HYBR	πp, pp 360, 400 GeV
$0.16\ ^{+0.08}_{-0.07}$		AGUILAR-...	86B	HYBR	See AGUILAR-BENITEZ 87E
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

$\left[\Gamma(\overline{K}^0 \text{anything}) + \Gamma(K^0 \text{anything})\right]/\Gamma_{\text{total}}$ Γ_4/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.61 ±0.05 OUR AVERAGE					
0.605±0.055±0.033	244 ± 22	ABLIKIM	06U	BES2	e^+e^- at 3773 MeV
0.612±0.065±0.043		COFFMAN	91	MRK3	e^+e^- 3.77 GeV

$\Gamma(K^+ \text{anything})/\Gamma_{\text{total}}$ Γ_5/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.055±0.013±0.009	COFFMAN	91	MRK3	e^+e^- 3.77 GeV

$\Gamma(K^*(892)^- \text{anything})/\Gamma_{\text{total}}$ Γ_6/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.057±0.052±0.007	7.2 ± 6.5	ABLIKIM	06U	BES2	e^+e^- at 3773 MeV

$\Gamma(\overline{K}^*(892)^0 \text{anything})/\Gamma_{\text{total}}$ — Γ_7/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.232±0.045±0.030	189 ± 36	ABLIKIM 05P	BES	$e^+e^- \approx$ 3773 MeV

$\Gamma(K^*(892)^+ \text{anything})/\Gamma_{\text{total}}$ — Γ_8/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.203	90	ABLIKIM 06U	BES2	e^+e^- at 3773 MeV

$\Gamma(K^*(892)^0 \text{anything})/\Gamma_{\text{total}}$ — Γ_9/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.066	90	ABLIKIM 05P	BES	$e^+e^- \approx$ 3773 MeV

$\Gamma(\eta \text{ anything})/\Gamma_{\text{total}}$ — Γ_{10}/Γ

This ratio includes η particles from η' decays.

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
6.3±0.5±0.5	1972 ± 142	HUANG 06B	CLEO	e^+e^- at $\psi(3770)$

$\Gamma(\eta' \text{ anything})/\Gamma_{\text{total}}$ — Γ_{11}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
1.04±0.16±0.09	82 ± 13	HUANG 06B	CLEO	e^+e^- at $\psi(3770)$

$\Gamma(\phi \text{ anything})/\Gamma_{\text{total}}$ — Γ_{12}/Γ

VALUE (units 10^{-2})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
1.03±0.10±0.07		248 ± 21	HUANG 06B	CLEO	e^+e^- at $\psi(3770)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<1.8	90		BAI 00C	BES	$e^+e^- \to D\overline{D}^*$, $D^*\overline{D}^*$

$\Gamma(\phi e^+ \text{ anything})/\Gamma_{\text{total}}$ — Γ_{13}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.016	90	BAI 00C	BES	$e^+e^- \to D\overline{D}^*$, $D^*\overline{D}^*$

Leptonic and semileptonic modes

$\Gamma(e^+\nu_e)/\Gamma_{\text{total}}$ — Γ_{14}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<2.4 \times 10^{-5}$	90	ARTUSO 05A	CLEO	e^+e^- at $\psi(3770)$

$\Gamma(\mu^+\nu_\mu)/\Gamma_{\text{total}}$ — Γ_{15}/Γ

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$4.40 \pm 0.66^{+0.09}_{-0.12}$	47 ± 7	[10] ARTUSO 05A	CLEO	e^+e^- at $\psi(3770)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$12.2\ ^{+11.1}_{-\ 5.3} \pm 1.0$	3	[11] ABLIKIM 05D	BES	$e^+e^- \approx$ 3.773 GeV
$3.5 \pm 1.4 \pm 0.6$	7	[12] BONVICINI 04A	CLEO	Incl. in ARTUSO 05A
$8\ ^{+16}_{-\ 5}\ ^{+5}_{-2}$	1	[13] BAI 98B	BES	$e^+e^- \to D^{*+}D^-$

[10] ARTUSO 05A obtains $f_{D^+} = 222.6 \pm 16.7^{+2.8}_{-3.4}$ MeV from this measurement.

[11] ABLIKIM 05D finds a background-subtracted 2.67 ± 1.74 $D^+ \rightarrow \mu^+ \nu_\mu$ events, and from this obtains $f_{D^+} = 371^{+129}_{-119} \pm 25$ MeV.

[12] BONVICINI 04A finds eight events with an estimated background of one, and from the branching fraction obtains $f_{D^+} = 202 \pm 41 \pm 17$ MeV.

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

$\Gamma(\tau^+ \nu_\tau)/\Gamma_{\text{total}}$ — Γ_{16}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
<2.1 × 10^{-3}	90	RUBIN	06A	CLEO	$e^+ e^-$ at $\psi(3770)$

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.086 ±0.005 OUR FIT					
0.087 ±0.005 OUR AVERAGE					
0.0895±0.0159±0.0067	34 ± 6	[14] ABLIKIM	05A	BES	$e^+ e^-$ at $\psi(3770)$
0.0871±0.0038±0.0037	545 ± 24	[15] HUANG	05B	CLEO	$e^+ e^-$ at $\psi(3770)$

[14] The ABLIKIM 05A result together with the $D^0 \rightarrow K^- e^+ \nu_e$ branching fraction of ABLIKIM 04C and Particle Data Group lifetimes gives $\Gamma(D^0 \rightarrow K^- e^+ \nu_e)$ / $\Gamma(D^+ \rightarrow \overline{K}^0 e^+ \nu_e) = 1.08 \pm 0.22 \pm 0.07$; isospin invariance predicts the ratio is 1.0.

[15] HUANG 05B finds $\Gamma(D^0 \rightarrow K^- e^+ \nu_e)$ / $\Gamma(D^+ \rightarrow \overline{K}^0 e^+ \nu_e) = 1.00 \pm 0.05 \pm 0.04$; isospin invariance predicts the ratio is 1.0.

$\Gamma(\overline{K}^0 e^+ \nu_e)/\Gamma(K^0_S \pi^+)$ — Γ_{18}/Γ_{45}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
5.8 ±0.4 OUR FIT					
5.20±0.70±0.52	186	[16] BEAN	93C	CLE2	$e^+ e^- \approx \Upsilon(4S)$

[16] 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. The value given is twice that in BEAN 93C because we are using $K^0_S \pi^+$ and not $\overline{K}^0 \pi^+$, in the denominator.

$\Gamma(\overline{K}^0 e^+ \nu_e)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{18}/Γ_{46}

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
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_{19}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.096±0.008 OUR FIT Error includes scale factor of 1.1.					
0.103±0.023±0.008	29 ± 6	ABLIKIM	07	BES2	$e^+ e^-$ at 3773 MeV

$\Gamma(\overline{K}^0 \mu^+ \nu_\mu)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{19}/Γ_{46}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.00 ±0.08 OUR FIT Error includes scale factor of 1.1.					
1.019±0.076±0.065	555 ± 39	LINK	04E	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma\big(\overline{K}^0 \mu^+ \nu_\mu\big)/\Gamma\big(\mu^+ \text{anything}\big)$ — Γ_{19}/Γ_2

VALUE	EVTS	DOCUMENT ID		COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.76±0.06	84	[17] AOKI	88	π^- emulsion

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

$\Gamma\big(K^- \pi^+ e^+ \nu_e\big)/\Gamma_{\text{total}}$ — Γ_{20}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
4.1 ±0.6 OUR FIT	Error includes scale factor of 1.1.				
$3.5\ ^{+0.7}_{-0.6}$ OUR AVERAGE					
3.50±0.75±0.27	29 ± 6	ABLIKIM	06O	BES2	e^+e^- at 3773 MeV
$3.5\ ^{+1.2}_{-0.7}$ ±0.4	14	[18] BAI	91	MRK3	$e^+e^- \approx$ 3.77 GeV

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

$\Gamma\big(\overline{K}^*(892)^0 e^+ \nu_e\big)/\Gamma_{\text{total}}$ — Γ_{38}/Γ

Unseen decay modes of $\overline{K}^*(892)^0$ are included. See the end of the D^+ Listings for measurements of $D^+ \to \overline{K}^*(892)^0 \ell^+ \nu_\ell$ form-factor ratios.

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
5.56±0.32 OUR FIT	Error includes scale factor of 1.2.				
5.52±0.34 OUR AVERAGE					
5.06±1.21±0.40	28 ± 7	ABLIKIM	06O	BES2	e^+e^- at 3773 MeV
5.56±0.27±0.23	422 ± 21	[19] HUANG	05B	CLEO	e^+e^- at $\psi(3770)$

[19] HUANG 05B finds $\Gamma(D^0 \to K^{*-} e^+\nu_e)$ / $\Gamma(D^+ \to \overline{K}^{*0} e^+\nu_e) = 0.98 \pm 0.08 \pm 0.04$; isospin invariance predicts the ratio is 1.0.

$\Gamma\big(\overline{K}^*(892)^0 e^+ \nu_e\big)/\Gamma\big(K^- \pi^+ e^+ \nu_e\big)$ — Γ_{38}/Γ_{20}

Unseen decay modes of the $\overline{K}^*(892)^0$ are included. See the end of the D^+ Listings for measurements of $D^+ \to \overline{K}^*(892)^0 \ell^+ \nu_\ell$ form-factor ratios.

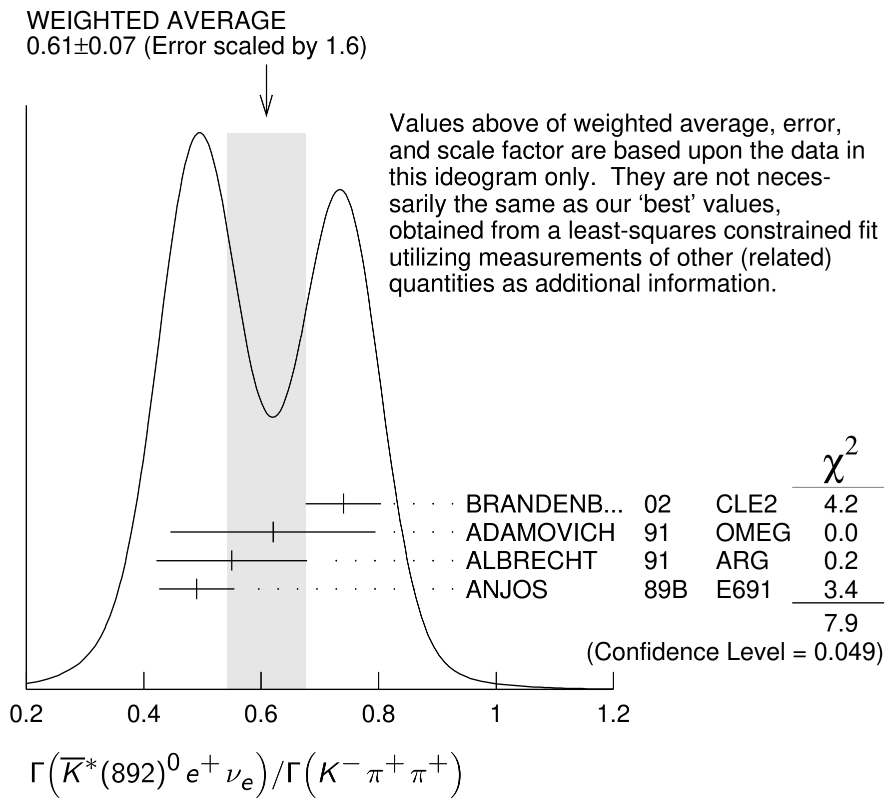
VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.37±0.22 OUR FIT	Error includes scale factor of 1.2.				
1.0 ±0.3	35	ADAMOVICH	91	OMEG	π^- 340 GeV

$\Gamma\big(\overline{K}^*(892)^0 e^+ \nu_e\big)/\Gamma\big(K^- \pi^+ \pi^+\big)$ — Γ_{38}/Γ_{46}

Unseen decay modes of the $\overline{K}^*(892)^0$ are included. See the end of the D^+ Listings for measurements of $D^+ \to \overline{K}^*(892)^0 \ell^+ \nu_\ell$ form-factor ratios.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.58±0.04 OUR FIT	Error includes scale factor of 1.3.				
0.61±0.07 OUR AVERAGE	Error includes scale factor of 1.6. See the ideogram below.				
0.74±0.04±0.05		BRANDENB...	02	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
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.67±0.09±0.07	710	[20] BEAN	93C	CLE2	See BRANDENBURG 02

[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.



$\Gamma(K^-\pi^+e^+\nu_e$ nonresonant$)/\Gamma_{total}$ $\qquad\Gamma_{22}/\Gamma$

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.007	90	[21] ANJOS	89B	E691	Photoproduction

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

$\Gamma(K^-\pi^+\mu^+\nu_\mu)/\Gamma(\overline{K}^0\mu^+\nu_\mu)$ $\qquad\Gamma_{23}/\Gamma_{19}$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.417±0.030±0.023	555 ± 39	LINK	04E	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma(\overline{K}^*(892)^0\mu^+\nu_\mu)/\Gamma_{total}$ $\qquad\Gamma_{39}/\Gamma$

Unseen decay modes of the $\overline{K}^*(892)^0$ are included. See the end of the D^+ Listings for measurements of $D^+ \to \overline{K}^*(892)^0\ell^+\nu_\ell$ form-factor ratios.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.0325±0.0071±0.0075	224	[22] KODAMA	92C	E653	π^- emulsion 600 GeV

[22] 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 $\Gamma(D^0 \to K^-\mu^+\nu_\mu) = (7.0 \pm 0.7) \times 10^{10}\ \mathrm{s}^{-1}$ to get the quoted branching fraction. See also the footnote to KODAMA 92C in the second data block below.

$\Gamma\left(\overline{K}^*(892)^0\mu^+\nu_\mu\right)/\Gamma\left(\overline{K}^0\mu^+\nu_\mu\right)$ Γ_{39}/Γ_{19}

Unseen decay modes of the $\overline{K}^*(892)^0$ are included. See the end of the D^+ Listings for measurements of $D^+ \rightarrow \overline{K}^*(892)^0\ell^+\nu_\ell$ form-factor ratios.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.58 ±0.05 OUR FIT					
0.594±0.043±0.033	555 ± 39	LINK	04E	FOCS	γ nucleus, $\overline{E}_\gamma\approx$ 180 GeV

$\Gamma\left(\overline{K}^*(892)^0\mu^+\nu_\mu\right)/\Gamma\left(K^-\pi^+\pi^+\right)$ Γ_{39}/Γ_{46}

Unseen decay modes of the $\overline{K}^*(892)^0$ are included. See the end of the D^+ Listings for measurements of $D^+ \rightarrow \overline{K}^*(892)^0\ell^+\nu_\ell$ form-factor ratios.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.58 ±0.05 OUR FIT Error includes scale factor of 1.1.					
0.57 ±0.06 OUR AVERAGE Error includes scale factor of 1.2.					
0.72 ±0.10 ±0.05		BRANDENB...	02	CLE2	$e^+e^-\approx\Upsilon(4S)$
0.56 ±0.04 ±0.06	875	FRABETTI	93E	E687	γBe $\overline{E}_\gamma\approx$ 200 GeV
0.46 ±0.07 ±0.08	224	[23] KODAMA	92C	E653	π^- emulsion 600 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.602±0.010±0.021	12k	[24] LINK	02J	FOCS	γ nucleus, $\approx$ 180 GeV

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

[24] This LINK 02J result includes the effects of an interference of a small S-wave $K^-\pi^+$ amplitude with the dominant $\overline{K}^{*0}$ amplitude. (The interference effect is reported in LINK 02E.) This result is redundant with results of LINK 04E elsewhere in these Listings.

$\Gamma\left(K^-\pi^+\mu^+\nu_\mu \text{ nonresonant}\right)/\Gamma\left(K^-\pi^+\mu^+\nu_\mu\right)$ Γ_{25}/Γ_{23}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0530±0.0074$^{+0.0099}_{-0.0096}$	14k	LINK	05I	FOCS	γ nucleus, $\overline{E}_\gamma\approx$ 180 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.083 ±0.029		FRABETTI	93E	E687	< 0.12 (90% CL)

$\Gamma\left(\pi^0 e^+\nu_e\right)/\Gamma_{\text{total}}$ Γ_{29}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0044±0.0006±0.0003	63 ± 9	[25] HUANG	05B	CLEO	e^+e^- at $\psi(3770)$

[25] HUANG 05B finds $\Gamma(D^0\rightarrow\pi^-e^+\nu_e)$ / 2 $\Gamma(D^+\rightarrow\pi^0e^+\nu_e) = 0.75^{+0.14}_{-0.11}\pm0.04$; isospin invariance predicts the ratio is 1.0.

$\Gamma\left(\pi^0\ell^+\nu_\ell\right)/\Gamma\left(\overline{K}^0\ell^+\nu_\ell\right)$ Γ_{30}/Γ_{17}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.046±0.014±0.017	100	[26] 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	[27] ALAM	93	CLE2	See BARTELT 97

[26] BARTELT 97 thus directly measures the product of ratios squared of CKM matrix elements and form factors at q^2=0: $|V_{cd}/V_{cs}|^2\cdot|f_+^\pi(0)/f_+^K(0)|^2 = 0.046\pm0.014\pm0.017$.

[27] ALAM 93 thus directly measures the product of ratios squared of CKM matrix elements and form factors at q^2=0: $|V_{cd}/V_{cs}|^2\cdot|f_+^\pi(0)/f_+^K(0)|^2 = 0.085\pm0.027\pm0.014$.

$\Gamma(\rho^0 e^+ \nu_e)/\Gamma_{total}$ — Γ_{31}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0022±0.0004 OUR FIT					
0.0021±0.0004±0.0001	27 ± 6	[28] HUANG	05B	CLEO	$e^+ e^-$ at $\psi(3770)$

[28] HUANG 05B finds $\Gamma(D^0 \rightarrow \rho^- e^+ \nu_e)$ / 2 $\Gamma(D^+ \rightarrow \rho^0 e^+ \nu_e) = 1.2^{+0.4}_{-0.3} \pm 0.1$; isospin invariance predicts the ratio is 1.0.

$\Gamma(\rho^0 e^+ \nu_e)/\Gamma(\overline{K}^*(892)^0 e^+ \nu_e)$ — Γ_{31}/Γ_{38}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.039±0.007 OUR FIT					
0.045±0.014±0.009	49	[29] AITALA	97	E791	π^- nucleus, 500 GeV

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

$\Gamma(\rho^0 \mu^+ \nu_\mu)/\Gamma(\overline{K}^*(892)^0 \mu^+ \nu_\mu)$ — Γ_{32}/Γ_{39}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.045±0.007 OUR AVERAGE Error includes scale factor of 1.1.					
0.041±0.006±0.004	320 ± 44	LINK	06B	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV
0.051±0.015±0.009	54	[30] AITALA	97	E791	π^- nucleus, 500 GeV
0.079±0.019±0.013	39	[31] 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	[32] KODAMA	93C	E653	π^- emulsion 600 GeV

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

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

[32] This KODAMA 93C result is based on a final signal of $4.0^{+2.8}_{-2.3}\pm1.3$ events; the estimates of backgrounds that affect this number are somewhat model dependent.

$\Gamma(\omega e^+ \nu_e)/\Gamma_{total}$ — Γ_{33}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.0016^{+0.0007}_{-0.0006}\pm0.0001}$	$7.6^{+3.3}_{-2.7}$	HUANG	05B	CLEO	$e^+ e^-$ at $\psi(3770)$

$\Gamma(\phi e^+ \nu_e)/\Gamma_{total}$ — Γ_{34}/Γ

Unseen decay modes of the ϕ are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0201	90	ABLIKIM	06P	BES2	$e^+ e^-$ at 3773 MeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0209	90	BAI	91	MRK3	$e^+ e^- \approx$ 3.77 GeV

$\Gamma(\phi \mu^+ \nu_\mu)/\Gamma_{total}$ — Γ_{35}/Γ

Unseen decay modes of the ϕ are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0204	90	ABLIKIM	06P	BES2	$e^+ e^-$ at 3773 MeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0372	90	BAI	91	MRK3	$e^+ e^- \approx$ 3.77 GeV

$\Gamma(\eta \ell^+ \nu_\ell)/\Gamma(\pi^0 \ell^+ \nu_\ell)$ — Γ_{36}/Γ_{30}

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

$\Gamma(\eta'(958) \mu^+ \nu_\mu)/\Gamma(\overline{K}^*(892)^0 \mu^+ \nu_\mu)$ — Γ_{37}/Γ_{39}

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

$\Gamma((\overline{K}^*(892)\pi)^0 e^+ \nu_e)/\Gamma_{\text{total}}$ — Γ_{26}/Γ

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

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

$\Gamma((\overline{K}\pi\pi)^0 e^+ \nu_e \text{ non-}\overline{K}^*(892))/\Gamma_{\text{total}}$ — Γ_{27}/Γ

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

$\Gamma(K^- \pi^+ \pi^0 \mu^+ \nu_\mu)/\Gamma(K^- \pi^+ \mu^+ \nu_\mu)$ — Γ_{28}/Γ_{23}

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_{40}/Γ_{39}

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_{41}/Γ_{39}

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

$\Gamma(\overline{K}_0^*(1430)^0 \mu^+ \nu_\mu)/\Gamma(K^- \pi^+ \mu^+ \nu_\mu)$ — Γ_{42}/Γ_{23}

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
<0.0064	90	LINK	05I	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma(\overline{K}_2^*(1430)^0 \mu^+ \nu_\mu)/\Gamma(\overline{K}^*(892)^0 \mu^+ \nu_\mu)$ — Γ_{43}/Γ_{39}

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

$\Gamma(\overline{K}^*(1680)^0 \mu^+ \nu_\mu)/\Gamma(K^- \pi^+ \mu^+ \nu_\mu)$ — Γ_{44}/Γ_{23}

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
<0.04	90	LINK	05I	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

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

$\Gamma(K^0_S\pi^+)/\Gamma_{total}$ — Γ_{45}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0147±0.0006 OUR FIT Error includes scale factor of 1.1.					
0.0155±0.0005±0.0006	2230 ± 60	[33] HE	05	CLEO	e^+e^- at $\psi(3770)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.016 ±0.003 ±0.001	161	ADLER	88C	MRK3	e^+e^- 3.77 GeV
0.017 ±0.004	36	[34] SCHINDLER	81	MRK2	e^+e^- 3.771 GeV
0.017 ±0.006	17	[35] PERUZZI	77	MRK1	e^+e^- 3.77 GeV

[33] HE 05 uses single- and double-tagged events in an overall fit. The fraction here includes (unobserved) final-state photons.

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

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

$\Gamma(K^0_S\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{45}/Γ_{46}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.1548±0.0032 OUR FIT Error includes scale factor of 1.3.					
0.1533±0.0027 OUR AVERAGE					
0.1530±0.0023±0.0016	10.6k	LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV
0.174 ±0.012 ±0.011	473	[36] BISHAI	97	CLE2	$e^+e^- \approx \Upsilon(4S)$
0.137 ±0.015 ±0.016	264	ANJOS	90C	E691	Photoproduction

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

$\Gamma(K^-\pi^+\pi^+)/\Gamma_{total}$ — Γ_{46}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0951±0.0034 OUR FIT Error includes scale factor of 1.1.					
0.0945±0.0033 OUR AVERAGE					
0.095 ±0.002 ±0.003	15.1k±130	[37] HE	05	CLEO	e^+e^- at $\psi(3770)$
0.093 ±0.006 ±0.008	1502	[38] BALEST	94	CLE2	$e^+e^- \approx \Upsilon(4S)$
0.091 ±0.013 ±0.004	1164	ADLER	88C	MRK3	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.064\ ^{+0.015}_{-0.014}$		[39] BARLAG	92C	ACCM	π^- Cu 230 GeV
$0.063\ ^{+0.028}_{-0.014}$ ±0.011	8	[39] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV
0.091 ±0.019	239	[40] SCHINDLER	81	MRK2	e^+e^- 3.771 GeV
0.086 ±0.020	85	[41] PERUZZI	77	MRK1	e^+e^- 3.77 GeV

[37] HE 05 uses single- and double-tagged events in an overall fit. The fraction here includes (unobserved) final-state photons.

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

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

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

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

A REVIEW GOES HERE – Check our WWW List of Reviews

A REVIEW GOES HERE – Check our WWW List of Reviews

$\Gamma((K^-\pi^+)_{S-\text{wave}}\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{47}/Γ_{46}

This is the "fit fraction" from the Dalitz-plot analysis. The $K^-\pi^+$ S-wave includes a broad scalar κ, the $\overline{K}{}^*_0(1430)^0$, and non-resonant background.

VALUE	DOCUMENT ID		TECN	COMMENT
0.786±0.014±0.018	AITALA	06	E791	Dalitz fit, 15.1k events

$\Gamma(\overline{K}{}^*_0(800)^0\pi^+, \overline{K}{}^*_0(800)\to K^-\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{48}/Γ_{46}

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.478±0.121±0.053	[42] AITALA	02	E791	See AITALA 06

[42] The $K^*_0(800)$ is a broad scalar resonance that may not exist and is not included in the Summary Tables. AITALA 02 finds that including such a resonance in the fit to the $D^+ \to K^-\pi^+\pi^+$ Dalitz plot greatly improves the fit. However, the results of AITALA 02 for the $D^+ \to K^-\pi^+\pi^+$ Dalitz plot analysis so disagree with earlier analyses that averaging the results makes no sense.

$\Gamma(\overline{K}{}^*(892)^0\pi^+, \overline{K}{}^*(892)^0\to K^-\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{49}/Γ_{46}

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
0.119±0.002±0.020	AITALA	06	E791	Dalitz fit, 15.1k events
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.123±0.010±0.009	[43] AITALA	02	E791	See AITALA 06
0.137±0.006±0.009	FRABETTI	94G	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
0.170±0.009±0.034	ANJOS	93	E691	γ Be 90–260 GeV
0.14 ±0.04 ±0.04	ALVAREZ	91B	NA14	Photoproduction
0.13 ±0.01 ±0.07	ADLER	87	MRK3	e^+e^- 3.77 GeV

[43] AITALA 02 includes a broad scalar $K^*_0(800)$ in the fit to the $D^+ \to K^-\pi^+\pi^+$ Dalitz plot. This (a) greatly improves the fit, and (b) gives results in other channels that greatly disagree with previous analyses. The disagreement is so large that it makes no sense to average the results with those of earlier experiments.

$\Gamma(\overline{K}{}^*_0(1430)^0\pi^+, \overline{K}{}^*_0(1430)^0\to K^-\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{50}/Γ_{46}

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.125±0.014±0.005	[44] AITALA	02	E791	See AITALA 06
0.284±0.022±0.059	FRABETTI	94G	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
0.248±0.019±0.017	ANJOS	93	E691	γ Be 90–260 GeV

[44] AITALA 02 includes a broad scalar $K^*_0(800)$ in the fit to the $D^+ \to K^-\pi^+\pi^+$ Dalitz plot. This (a) greatly improves the fit, and (b) gives results in other channels that greatly disagree with previous analyses. The disagreement is so large that it makes no sense to average the results with those of earlier experiments.

$\Gamma\big(\overline{K}{}_2^*(1430)^0\pi^+ , \overline{K}{}_2^*(1430)^0 \to K^-\pi^+\big)/\Gamma\big(K^-\pi^+\pi^+\big)$ Γ_{51}/Γ_{46}

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
0.002±0.001 ±0.001	AITALA	06	E791	Dalitz fit, 15.1k events
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.005±0.001 ±0.002	[45] AITALA	02	E791	See AITALA 06

[45] AITALA 02 includes a broad scalar $K_0^*(800)$ in the fit to the $D^+ \to K^-\pi^+\pi^+$ Dalitz plot. This (a) greatly improves the fit, and (b) gives results in other channels that greatly disagree with previous analyses. The disagreement is so large that it makes no sense to average the results with those of earlier experiments.

$\Gamma\big(\overline{K}{}^*(1680)^0\pi^+ , \overline{K}{}^*(1680)^0 \to K^-\pi^+\big)/\Gamma\big(K^-\pi^+\pi^+\big)$ Γ_{52}/Γ_{46}

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
0.012±0.006±0.012	AITALA	06	E791	Dalitz fit, 15.1k events
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.025±0.007±0.003	[46] AITALA	02	E791	See AITALA 06
0.047±0.006±0.007	FRABETTI	94G	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
0.030±0.004±0.013	ANJOS	93	E691	γ Be 90–260 GeV

[46] AITALA 02 includes a broad scalar $K_0^*(800)$ in the fit to the $D^+ \to K^-\pi^+\pi^+$ Dalitz plot. This (a) greatly improves the fit, and (b) gives results in other channels that greatly disagree with previous analyses. The disagreement is so large that it makes no sense to average the results with those of earlier experiments.

$\Gamma\big(K^-\pi^+\pi^+$ nonresonant$\big)/\Gamma\big(K^-\pi^+\pi^+\big)$ Γ_{53}/Γ_{46}

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.130±0.058±0.044	[47] AITALA	02	E791	See AITALA 06
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

[47] AITALA 02 includes a broad scalar $K_0^*(800)$ in the fit to the $D^+ \to K^-\pi^+\pi^+$ Dalitz plot. This (a) greatly improves the fit, and (b) gives results in other channels that greatly disagree with previous analyses. The disagreement is so large that it makes no sense to average the results with those of earlier experiments.

$\Gamma\big(K_S^0\pi^+\pi^0\big)/\Gamma_{\rm total}$ Γ_{54}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.070±0.005 OUR FIT	Error includes scale factor of 1.3.				
0.072±0.002±0.004	5090 ± 100	[48] HE	05	CLEO	e^+e^- at $\psi(3770)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.051±0.013±0.008	159	ADLER	88C	MRK3	e^+e^- 3.77 GeV
0.09 ±0.06	10	[49] SCHINDLER	81	MRK2	e^+e^- 3.771 GeV

[48] HE 05 uses single- and double-tagged events in an overall fit. The fraction here includes (unobserved) final-state photons.

[49] 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.

$\Gamma(K^0_S \rho^+)/\Gamma(K^0_S \pi^+ \pi^0)$ — Γ_{55}/Γ_{54}

This is the "fit fraction" from the Dalitz-plot analysis.

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

$\Gamma(\overline{K}^*(892)^0 \pi^+, \overline{K}^*(892)^0 \to K^0_S \pi^0)/\Gamma(K^0_S \pi^+ \pi^0)$ — Γ_{56}/Γ_{54}

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
0.19±0.06±0.06	ADLER	87	MRK3	$e^+ e^-$ 3.77 GeV

$\Gamma(K^0_S \pi^+ \pi^0 \text{ nonresonant})/\Gamma(K^0_S \pi^+ \pi^0)$ — Γ_{57}/Γ_{54}

This is the "fit fraction" from the Dalitz-plot analysis.

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

$\Gamma(K^- \pi^+ \pi^+ \pi^0)/\Gamma_{\text{total}}$ — Γ_{58}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0600±0.0028 OUR FIT Error includes scale factor of 1.1.					
0.060 ±0.002 ±0.002	4840 ± 100	[50] HE	05	CLEO	$e^+ e^-$ at $\psi(3770)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.058 ±0.012 ±0.012	142	COFFMAN	92B	MRK3	$e^+ e^-$ 3.77 GeV
0.063 $^{+0.014}_{-0.013}$ ±0.012	175	BALTRUSAIT...	86E	MRK3	See COFFMAN 92B

[50] HE 05 uses single- and double-tagged events in an overall fit. The fraction here includes (unobserved) final-state photons.

$\Gamma(K^- \pi^+ \pi^+ \pi^0)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{58}/Γ_{46}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.76±0.11±0.12	91	ANJOS	92C	E691	γ Be 90–260 GeV
0.69±0.10±0.16		ANJOS	89E	E691	See ANJOS 92C

$\Gamma(\overline{K}^*(892)^0 \rho^+ \text{ total})/\Gamma(K^- \pi^+ \pi^+ \pi^0)$ — Γ_{84}/Γ_{58}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.33±0.165±0.12	[51] ANJOS	92C	E691	γ Be 90–260 GeV

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

$\Gamma(\overline{K}^*(892)^0 \rho^+ \text{ S-wave})/\Gamma(K^- \pi^+ \pi^+ \pi^0)$ — Γ_{85}/Γ_{58}

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

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

$\Gamma\big(\overline{K}^*(892)^0 \rho^+ \ P\text{-wave}\big)/\Gamma_{\text{total}}$ — Γ_{86}/Γ

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

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

$\Gamma\big(\overline{K}^*(892)^0 \rho^+ \ D\text{-wave}\big)/\Gamma\big(K^-\pi^+\pi^+\pi^0\big)$ — Γ_{87}/Γ_{58}

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	γBe 90–260 GeV

$\Gamma\big(\overline{K}^*(892)^0 \rho^+ \ D\text{-wave longitudinal}\big)/\Gamma_{\text{total}}$ — Γ_{88}/Γ

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

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

$\Gamma\big(\overline{K}_1(1400)^0 \pi^+\big)/\Gamma\big(K^-\pi^+\pi^+\pi^0\big)$ — Γ_{90}/Γ_{58}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.907±0.218±0.180	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

$\Gamma\big(K^-\rho^+\pi^+ \text{ total}\big)/\Gamma\big(K^-\pi^+\pi^+\pi^0\big)$ — Γ_{61}/Γ_{58}

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	γBe 90–260 GeV

$\Gamma\big(K^-\rho^+\pi^+ \text{ 3-body}\big)/\Gamma\big(K^-\pi^+\pi^+\pi^0\big)$ — Γ_{62}/Γ_{58}

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

$\Gamma\big(\overline{K}^*(892)^0 \pi^+\pi^0 \text{ total}\big)/\Gamma\big(K^-\pi^+\pi^+\pi^0\big)$ — Γ_{92}/Γ_{58}

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	γBe 90–260 GeV

$\Gamma\big(\overline{K}^*(892)^0 \pi^+\pi^0 \text{ 3-body}\big)/\Gamma_{\text{total}}$ — Γ_{93}/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	[52] COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

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

$\Gamma\big(\overline{K}^*(892)^0\pi^+\pi^0$ 3-body$\big)/\Gamma\big(K^-\pi^+\pi^+\pi^0\big)$ Γ_{93}/Γ_{58}

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

$\Gamma\big(K^*(892)^-\pi^+\pi^+$ 3-body$\big)/\Gamma\big(K^-\pi^+\pi^+\pi^0\big)$ Γ_{95}/Γ_{58}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.24±0.12±0.09	ANJOS	92C	E691	γ Be 90–260 GeV

$\Gamma\big(K^-\pi^+\pi^+\pi^0$ nonresonant$\big)/\Gamma_{total}$ Γ_{66}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.002	90	[53] ANJOS	92C	E691	γ Be 90–260 GeV

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

$\Gamma\big(K^-\pi^+\pi^+\pi^0$ nonresonant$\big)/\Gamma\big(K^-\pi^+\pi^+\pi^0\big)$ Γ_{66}/Γ_{58}

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0310±0.0022 OUR FIT Error includes scale factor of 1.1.					
0.032 ±0.001 ±0.002	3210 ± 85	[54] HE	05	CLEO	e^+e^- at $\psi(3770)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.021 $^{+0.010}_{-0.009}$		[55] BARLAG	92C	ACCM	π^- Cu 230 GeV
0.033 ±0.008 ±0.002	168	ADLER	88C	MRK3	e^+e^- 3.77 GeV
0.122 $^{+0.032}_{-0.021}$ ±0.021	11	[55] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV
0.06 ±0.03	21	[56] SCHINDLER	81	MRK2	e^+e^- 3.771 GeV

[54] HE 05 uses single- and double-tagged events in an overall fit. The fraction here includes (unobserved) final-state photons.

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

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

$\Gamma\big(K^0_S\pi^+\pi^+\pi^-\big)/\Gamma\big(K^-\pi^+\pi^+\big)$ Γ_{67}/Γ_{46}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.327±0.018 OUR FIT Error includes scale factor of 1.1.					
0.39 ±0.04 ±0.06	229 ± 17	ANJOS	92C	E691	γ Be 90–260 GeV

$\Gamma\big(K^0_S a_1(1260)^+\big)/\Gamma\big(K^0_S\pi^+\pi^+\pi^-\big)$ Γ_{82}/Γ_{67}

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

$\Gamma(K^0_S a_2(1320)^+)/\Gamma_{total}$ — Γ_{83}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0015	90	ANJOS	92C	E691	γ Be 90–260 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.004	90	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

$\Gamma(\overline{K}_1(1270)^0\pi^+)/\Gamma_{total}$ — Γ_{89}/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_{90}/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	[57] ANJOS	92C	E691	γ Be 90–260 GeV

[57] 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.

$\Gamma(\overline{K}_1(1400)^0\pi^+)/\Gamma(K^0_S\pi^+\pi^+\pi^-)$ — Γ_{90}/Γ_{67}

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

VALUE	DOCUMENT ID		TECN	COMMENT
1.246±0.212±0.360	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

$\Gamma(\overline{K}^*(1410)^0\pi^+)/\Gamma_{total}$ — Γ_{91}/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

$\Gamma(K^*(892)^-\pi^+\pi^+\text{total})/\Gamma(K^0_S\pi^+\pi^+\pi^-)$ — Γ_{94}/Γ_{67}

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. • • •					
0.82±0.28	14	ALEEV	94	BIS2	nN 20–70 GeV

$\Gamma(K^*(892)^-\pi^+\pi^+\text{3-body})/\Gamma_{total}$ — Γ_{95}/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. • • •					
<0.013	90	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

$\Gamma\big(K^*(892)^-\pi^+\pi^+\,\text{3-body}\big)/\Gamma\big(K^0_S\pi^+\pi^+\pi^-\big)$ — Γ_{95}/Γ_{67}

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

VALUE	DOCUMENT ID		TECN	COMMENT
1.00±0.18±0.42	ANJOS	92C	E691	γ Be 90–260 GeV

$\Gamma\big(K^0_S\rho^0\pi^+\,\text{total}\big)/\Gamma\big(K^0_S\pi^+\pi^+\pi^-\big)$ — Γ_{71}/Γ_{67}

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

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

$\Gamma\big(K^0_S\rho^0\pi^+\,\text{3-body}\big)/\Gamma_{\text{total}}$ — Γ_{72}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.002	90	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

$\Gamma\big(K^0_S\rho^0\pi^+\,\text{3-body}\big)/\Gamma\big(K^0_S\pi^+\pi^+\pi^-\big)$ — Γ_{72}/Γ_{67}

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

$\Gamma\big(K^0_S f_0(980)\pi^+\big)/\Gamma_{\text{total}}$ — Γ_{96}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0025	90	ANJOS	92C	E691	γ Be 90–260 GeV

$\Gamma\big(K^0_S\pi^+\pi^+\pi^-\,\text{nonresonant}\big)/\Gamma\big(K^0_S\pi^+\pi^+\pi^-\big)$ — Γ_{73}/Γ_{67}

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

$\Gamma\big(K^-3\pi^+\pi^-\big)/\Gamma\big(K^-\pi^+\pi^+\big)$ — Γ_{74}/Γ_{46}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.061±0.005 OUR FIT Error includes scale factor of 1.1.					
0.062±0.008 OUR AVERAGE Error includes scale factor of 1.3.					
0.058±0.002±0.006	2923	LINK	03D	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV
0.077±0.008±0.010	239	FRABETTI	97C	E687	γ Be, $\overline{E}_\gamma \approx$ 200 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.09 ±0.01 ±0.01	113	ANJOS	90D	E691	Photoproduction

$\Gamma\big(\overline{K}^*(892)^0\pi^+\pi^+\pi^-, \overline{K}^*(892)^0\to K^-\pi^+\big)/\Gamma\big(K^-3\pi^+\pi^-\big)$ — Γ_{75}/Γ_{74}

VALUE	DOCUMENT ID		TECN	COMMENT
0.21±0.04±0.06	LINK	03D	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma\big(\overline{K}^*(892)^0\rho^0\pi^+, \overline{K}^*(892)^0\to K^-\pi^+\big)/\Gamma\big(K^-3\pi^+\pi^-\big)$ — Γ_{76}/Γ_{74}

VALUE	DOCUMENT ID		TECN	COMMENT
0.40±0.03±0.06	LINK	03D	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma\big(\overline{K}^*(892)^0 \rho^0 \pi^+, \overline{K}^*(892)^0 \to K^- \pi^+\big)/\Gamma\big(K^- \pi^+ \pi^+\big)$ — Γ_{76}/Γ_{46}

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.016 \pm 0.007 \pm 0.004$	FRABETTI	97C	E687	γ Be, $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma\big(\overline{K}^*(892)^0 \pi^+ \pi^+ \pi^-$ no-ρ, $\overline{K}^*(892)^0 \to K^- \pi^+\big)/\Gamma\big(K^- \pi^+ \pi^+\big)$ — Γ_{77}/Γ_{46}

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.032 \pm 0.010 \pm 0.008$	FRABETTI	97C	E687	γ Be, $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma\big(K^- \rho^0 \pi^+ \pi^+\big)/\Gamma\big(K^- \pi^+ \pi^+\big)$ — Γ_{78}/Γ_{46}

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.034 \pm 0.009 \pm 0.005$	FRABETTI	97C	E687	γ Be, $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma\big(K^- \rho^0 \pi^+ \pi^+\big)/\Gamma\big(K^- 3\pi^+ \pi^-\big)$ — Γ_{78}/Γ_{74}

VALUE	DOCUMENT ID		TECN	COMMENT
$0.30 \pm 0.04 \pm 0.01$	LINK	03D	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma\big(\overline{K}^*(892)^0 a_1(1260)^+\big)/\Gamma\big(K^- \pi^+ \pi^+\big)$ — Γ_{97}/Γ_{46}

Unseen decay modes of the $\overline{K}^*(892)^0$ and $a_1(1260)^+$ are included.

VALUE	DOCUMENT ID		TECN	COMMENT
$0.099 \pm 0.008 \pm 0.018$	LINK	03D	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma\big(K^- 3\pi^+ \pi^-$ nonresonant$\big)/\Gamma\big(K^- 3\pi^+ \pi^-\big)$ — Γ_{79}/Γ_{74}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$0.07 \pm 0.05 \pm 0.01$		LINK	03D	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.026	90	FRABETTI	97C	E687	γ Be, $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma\big(K^+ 2K^0_S\big)/\Gamma\big(K^- \pi^+ \pi^+\big)$ — Γ_{80}/Γ_{46}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.049 ± 0.022 OUR AVERAGE Error includes scale factor of 2.4.					
$0.035 \pm 0.010 \pm 0.005$	39 ± 9	ALBRECHT	94I	ARG	$e^+ e^- \approx$ 10 GeV
0.085 ± 0.018	70 ± 12	AMMAR	91	CLEO	$e^+ e^- \approx$ 10.5 GeV

$\Gamma\big(K^+ K^- K^0_S \pi^+\big)/\Gamma\big(K^0_S \pi^+ \pi^+ \pi^-\big)$ — Γ_{81}/Γ_{67}

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
$7.7 \pm 1.5 \pm 0.9$	35 ± 7	LINK	01C	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

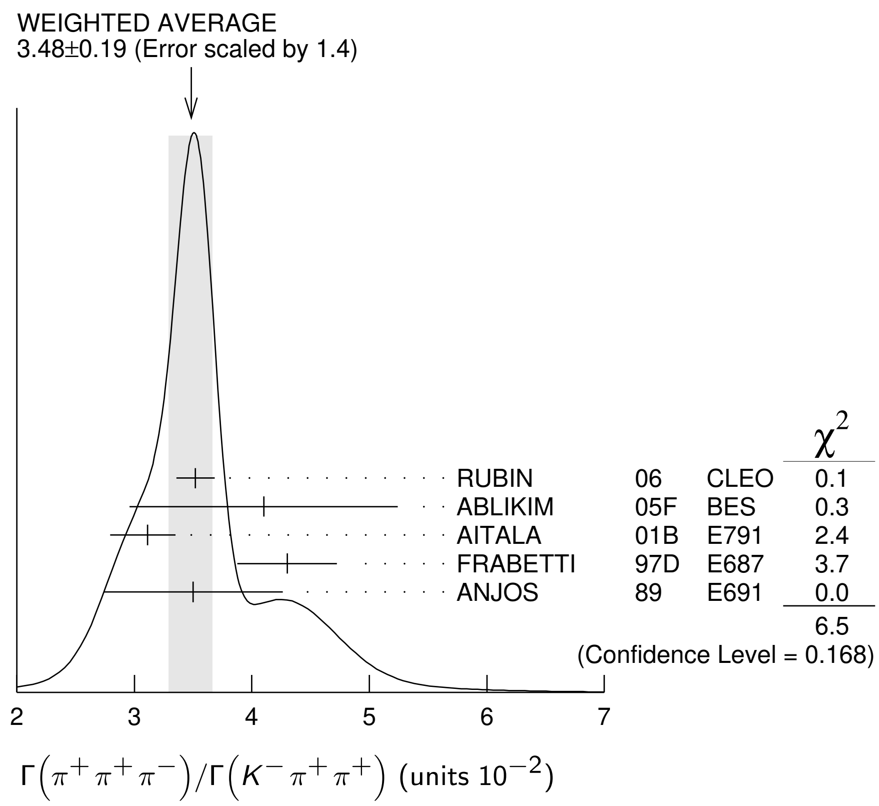
Pionic modes

$\Gamma(\pi^+\pi^0)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{98}/Γ_{46}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
1.34±0.07 OUR AVERAGE					
1.33±0.11±0.09	1229 ± 99	AUBERT,B	06F	BABR	$e^+e^- \approx \Upsilon(4S)$
1.33±0.07±0.06	914 ± 46	RUBIN	06	CLEO	e^+e^- at $\psi(3770)$
1.44±0.19±0.10	171 ± 22	ARMS	04	CLEO	$e^+e^- \approx$ 10 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.8 ±0.6 ±0.5	34	SELEN	93	CLE2	See ARMS 04

$\Gamma(\pi^+\pi^+\pi^-)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{99}/Γ_{46}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
3.48±0.19 OUR AVERAGE Error includes scale factor of 1.4. See the ideogram below.					
3.52±0.11±0.12	3303 ± 95	RUBIN	06	CLEO	e^+e^- at $\psi(3770)$
4.1 ±1.1 ±0.3	85 ± 22	ABLIKIM	05F	BES	$e^+e^- \approx \psi(3770)$
$3.11\pm0.18^{+0.16}_{-0.26}$	1172	AITALA	01B	E791	π^- nucleus, 500 GeV
4.3 ±0.3 ±0.3	236	FRABETTI	97D	E687	γ Be $\approx$ 200 GeV
3.5 ±0.7 ±0.3	83	ANJOS	89	E691	Photoproduction
• • • We do not use the following data for averages, fits, limits, etc. • • •					
3.2 ±1.1 ±0.3	20	ADAMOVICH	93	WA82	π^- 340 GeV
4.2 ±1.6 ±1.0	57	BALTRUSAIT...	85E	MRK3	e^+e^- 3.77 GeV



$\Gamma(\rho^0\pi^+)/\Gamma(\pi^+\pi^+\pi^-)$ — Γ_{100}/Γ_{99}

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
0.322 ±0.027 OUR AVERAGE				
0.3082±0.0314±0.0230	LINK	04	FOCS	Dalitz fit, 1527 ± 51 evts
0.336 ±0.032 ±0.022	AITALA	01B	E791	Dalitz fit, 1172 evts
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.289 ±0.055 ±0.058	[58] FRABETTI	97D	E687	γ Be ≈ 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.

$\Gamma(\pi^+(\pi^+\pi^-)_{S-\mathrm{wave}})/\Gamma(\pi^+\pi^+\pi^-)$ — Γ_{101}/Γ_{99}

This is the "fit fraction" from the Dalitz-plot analysis. See also the next three data blocks.

VALUE	DOCUMENT ID		TECN	COMMENT
0.5600±0.0324±0.0214	[59] LINK	04	FOCS	Dalitz fit, 1527 ± 51 evts

[59] LINK 04 borrows a K-matrix parametrization from ANISOVICH 03 of the full π-π S-wave isoscalar scattering amplitude to describe the $\pi^+\pi^-$ S-wave component of the $\pi^+\pi^+\pi^-$ state. The fit fraction given above is a sum over five f_0 mesons, the $f_0(980)$, $f_0(1300)$, $f_0(1200–1600)$, $f_0(1500)$, and $f_0(1750)$. See LINK 04 for details and discussion.

$\Gamma(\sigma\pi^+, \sigma\to\pi^+\pi^-)/\Gamma(\pi^+\pi^+\pi^-)$ — Γ_{102}/Γ_{99}

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
0.463±0.090±0.021	AITALA	01B	E791	Dalitz fit, 1172 evts

$\Gamma(f_0(980)\pi^+, f_0(980)\to\pi^+\pi^-)/\Gamma(\pi^+\pi^+\pi^-)$ — Γ_{103}/Γ_{99}

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
0.062±0.013±0.004	AITALA	01B	E791	Dalitz fit, 1172 evts

$\Gamma(f_0(1370)\pi^+, f_0(1370)\to\pi^+\pi^-)/\Gamma(\pi^+\pi^+\pi^-)$ — Γ_{104}/Γ_{99}

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
0.023±0.015±0.008	AITALA	01B	E791	Dalitz fit, 1172 evts

$\Gamma(f_2(1270)\pi^+, f_2(1270)\to\pi^+\pi^-)/\Gamma(\pi^+\pi^+\pi^-)$ — Γ_{105}/Γ_{99}

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
0.15 ±0.04 OUR AVERAGE Error includes scale factor of 2.4.				
0.1174±0.0190±0.0029	LINK	04	FOCS	Dalitz fit, 1527 ± 51 evts
0.194 ±0.025 ±0.004	AITALA	01B	E791	Dalitz fit, 1172 evts

$\Gamma(\rho(1450)^0\pi^+, \rho(1450)^0\to\pi^+\pi^-)/\Gamma(\pi^+\pi^+\pi^-)$ — Γ_{106}/Γ_{99}

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.007±0.007±0.003	AITALA	01B	E791	Dalitz fit, 1172 evts

$\Gamma(\pi^+\pi^+\pi^-$ nonresonant$)/\Gamma(\pi^+\pi^+\pi^-)$ — Γ_{107}/Γ_{99}

This is the "fit fraction" from the Dalitz-plot analysis. 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. LINK 04 (see earlier data blocks), in agreement with AITALA 01B, finds no evidence for a large nonresonant fraction.

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.078±0.060±0.027	AITALA	01B	E791	Dalitz fit, 1172 evts
0.589±0.105±0.081	[60] FRABETTI	97D	E687	γ Be ≈ 200 GeV

[60] 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.

$\Gamma(\pi^+ 2\pi^0)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{108}/Γ_{46}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
5.0±0.3±0.3	1535 ± 89	RUBIN	06	CLEO	e^+e^- at $\psi(3770)$

$\Gamma(\pi^+\pi^+\pi^-\pi^0)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{109}/Γ_{46}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
12.4±0.5±0.6	5701 ± 205	RUBIN	06	CLEO	e^+e^- at $\psi(3770)$

$\Gamma(\eta\pi^+)/\Gamma(\phi\pi^+)$ — $\Gamma_{114}/\Gamma_{136}$

Unseen decay modes of the η are included.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.54±0.06 OUR FIT					
0.49±0.08	275	JESSOP	98	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\eta\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{114}/Γ_{46}

Unseen decay modes of the η are included.

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
3.68±0.31 OUR FIT					
3.81±0.26±0.21	377 ± 26	RUBIN	06	CLEO	e^+e^- at $\psi(3770)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
8.3 ±2.3 ±1.4	99	DAOUDI	92	CLE2	See JESSOP 98

$\Gamma(\omega\pi^+)/\Gamma_{total}$ — Γ_{115}/Γ

Unseen decay modes of the ω are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<3.4\times10^{-4}$	90	RUBIN	06	CLEO	e^+e^- at $\psi(3770)$

$\Gamma(3\pi^+ 2\pi^-)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{112}/Γ_{46}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
1.77±0.17 OUR FIT					
1.73±0.20±0.17	732 ± 77	RUBIN	06	CLEO	e^+e^- at $\psi(3770)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.3 ±0.4 ±0.2	58	FRABETTI	97C	E687	γBe, $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma(3\pi^+ 2\pi^-)/\Gamma(K^- 3\pi^+\pi^-)$ — Γ_{112}/Γ_{74}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.289±0.019 OUR FIT					
0.290±0.017±0.011	835	LINK	03D	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma(\eta\rho^+)/\Gamma(\phi\pi^+)$ — $\Gamma_{116}/\Gamma_{136}$

Unseen decay modes of the η are included.

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

$\Gamma(\eta'(958)\pi^+)/\Gamma(\phi\pi^+)$ — $\Gamma_{117}/\Gamma_{136}$

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

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

$\Gamma(\eta'(958)\rho^+)/\Gamma(\phi\pi^+)$ — $\Gamma_{118}/\Gamma_{136}$

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

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

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

$\Gamma(K^+K^0_S)/\Gamma(K^0_S\pi^+)$ — Γ_{119}/Γ_{45}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.201 ±0.011 OUR FIT					
0.206 ±0.014 OUR AVERAGE					
0.222 ±0.037 ±0.013	63 ± 10	ABLIKIM	05F	BES	$e^+e^- \approx \psi(3770)$
0.1892±0.0155±0.0073	278 ± 21	ARMS	04	CLEO	$e^+e^- \approx$ 10 GeV
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	[61] LINK	02B	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV
0.222 ±0.041 ±0.019	70	[62] BISHAI	97	CLE2	See ARMS 04

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

$\Gamma(K^+K^0_S)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{119}/Γ_{46}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
3.11±0.17 OUR FIT					
3.02±0.18±0.15	949	LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
3.86±0.69±0.37	70	[63] BISHAI	97	CLE2	See ARMS 04

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

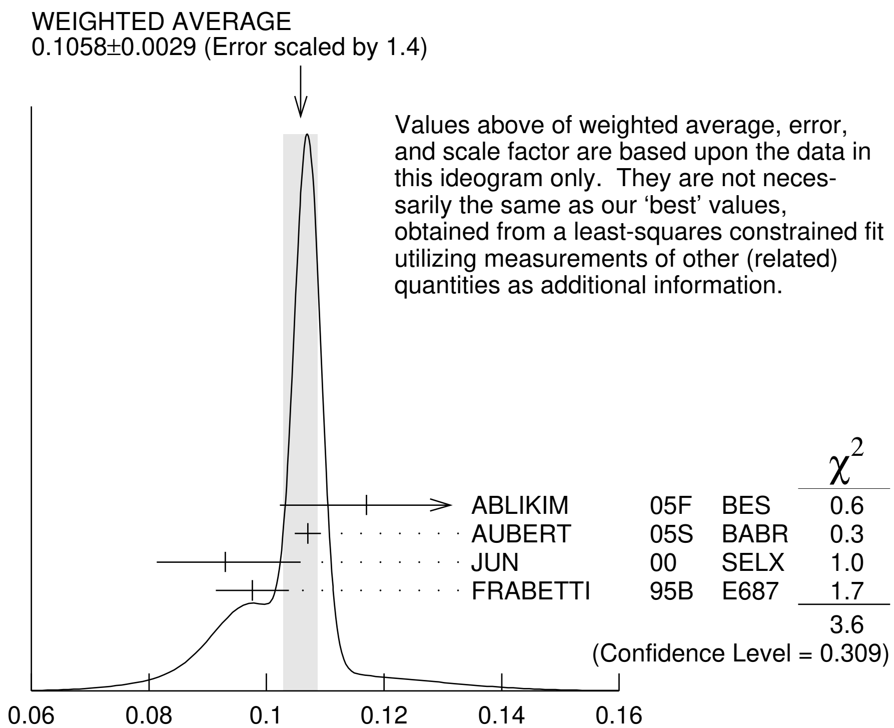
$\Gamma(K^+K^-\pi^+)/\Gamma_{total}$ — Γ_{120}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0100±0.0004 OUR FIT	Error includes scale factor of 1.2.				
0.0097±0.0004±0.0004	1250 ± 40	[64] HE	05	CLEO	e^+e^- at $\psi(3770)$

[64] HE 05 uses single- and double-tagged events in an overall fit. The fraction here includes (unobserved) final-state photons.

$\Gamma(K^+K^-\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{120}/Γ_{46}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.1054±0.0025 OUR FIT Error includes scale factor of 1.3.					
0.1058±0.0029 OUR AVERAGE Error includes scale factor of 1.4. See the ideogram below.					
0.117 ±0.013 ±0.007	181 ± 20	ABLIKIM	05F	BES	$e^+e^- \approx \psi(3770)$
0.107 ±0.001 ±0.002	43k	AUBERT	05S	BABR	$e^+e^- \approx \Upsilon(4S)$
0.093 ±0.010 $^{+0.008}_{-0.006}$		JUN	00	SELX	Σ^- nucleus, 600 GeV
0.0976±0.0042±0.0046		FRABETTI	95B	E687	γ Be, $\overline{E}_\gamma \approx$ 200 GeV



$\Gamma(K^+K^-\pi^+)/\Gamma(K^-\pi^+\pi^+)$ Γ_{120}/Γ_{46}

$\Gamma(\phi\pi^+, \phi\to K^+K^-)/\Gamma(K^+K^-\pi^+)$ — $\Gamma_{121}/\Gamma_{120}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
0.317±0.034 OUR FIT				
0.292±0.031±0.030	FRABETTI	95B	E687	Dalitz fit, 915 evts

$\Gamma(\phi\pi^+, \phi\to K^+K^-)/\Gamma(\phi\pi^+)$ — $\Gamma_{121}/\Gamma_{136}$

VALUE	DOCUMENT ID	
0.491±0.006 OUR FIT		
0.491±0.006	[65] PDG	06

[65] This is, of course, just the $\phi \to K^+K^-$ branching fraction, but we need it to connect other modes in the fit.

$\Gamma(\phi\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{136}/Γ_{46}

Unseen decay modes of the ϕ are included. However, we now get branching fractions for resonant submodes of $K^+K^-\pi^+$ decays from Dalitz-plot analyses.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.057\pm0.011\pm0.003$	46 ± 9	ABLIKIM	06P	BES2	e^+e^- at 3773 MeV
$0.062\pm0.017\pm0.006$	19	ADAMOVICH	93	WA82	π^- 340 GeV
$0.077\pm0.011\pm0.005$	128	DAOUDI	92	CLE2	$e^+e^-\approx$ 10.5 GeV
$0.098\pm0.032\pm0.014$	12	ALVAREZ	90C	NA14	Photoproduction
$0.071\pm0.008\pm0.007$	84	ANJOS	88	E691	Photoproduction
$0.084\pm0.021\pm0.011$	21	BALTRUSAIT...	85E	MRK3	e^+e^- 3.77 GeV

$\Gamma(K^+\overline{K}^*(892)^0, \overline{K}^*(892)^0\to K^-\pi^+)/\Gamma(K^+K^-\pi^+)$ — $\Gamma_{122}/\Gamma_{120}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
$0.301\pm0.020\pm0.025$	FRABETTI	95B	E687	Dalitz fit, 915 evts

$\Gamma(K^+\overline{K}_0^*(1430)^0, \overline{K}_0^*(1430)^0\to K^-\pi^+)/\Gamma(K^+K^-\pi^+)$ — $\Gamma_{123}/\Gamma_{120}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
$0.370\pm0.035\pm0.018$	FRABETTI	95B	E687	Dalitz fit, 915 evts

$\Gamma(K^+\overline{K}^*(892)^0)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{139}/Γ_{46}

Unseen decay modes of the $\overline{K}^*(892)^0$ are included. However, we now get branching fractions for resonant submodes of $K^+K^-\pi^+$ decays from Dalitz-plot analyses.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.058\pm0.009\pm0.006$	73	ANJOS	88	E691	Photoproduction
$0.048\pm0.021\pm0.011$	14	BALTRUSAIT...	85E	MRK3	e^+e^- 3.77 GeV

$\Gamma(K^+K^-\pi^+ \text{ nonresonant})/\Gamma(K^-\pi^+\pi^+)$ — Γ_{124}/Γ_{46}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.049\pm0.008\pm0.006$	95	ANJOS	88	E691	Photoproduction
$0.059\pm0.026\pm0.009$	37	BALTRUSAIT...	85E	MRK3	e^+e^- 3.77 GeV

$\Gamma(K^*(892)^+K_S^0)/\Gamma(K_S^0\pi^+)$ — Γ_{140}/Γ_{45}

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$1.1\pm0.3\pm0.4$	67	FRABETTI	95	E687	γ Be $\overline{E}_\gamma\approx$ 200 GeV

$\Gamma(\phi\pi^+\pi^0)/\Gamma_{total}$ — Γ_{137}/Γ

Unseen decay modes of the ϕ are included.

VALUE	DOCUMENT ID		TECN	COMMENT
0.023 ± 0.010	[66] BARLAG	92C	ACCM	π^- Cu 230 GeV

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

$\Gamma(\phi\pi^+\pi^0)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{137}/Γ_{46}

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_{138}/Γ_{46}

Unseen decay modes of the ϕ are included.

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

$\Gamma(K^+K^-\pi^+\pi^0\ \text{non-}\phi)/\Gamma_{\text{total}}$ — Γ_{130}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.015^{+0.007}_{-0.006}}$	[67] BARLAG	92C	ACCM	π^- Cu 230 GeV

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

$\Gamma(K^+K^-\pi^+\pi^0\ \text{non-}\phi)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{130}/Γ_{46}

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

$\Gamma(K^+K^0_S\pi^+\pi^-)/\Gamma(K^0_S\pi^+\pi^+\pi^-)$ — Γ_{131}/Γ_{67}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
5.62±0.39±0.40	469 ± 32	LINK	01C	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma(K^0_S K^-\pi^+\pi^+)/\Gamma(K^0_S\pi^+\pi^+\pi^-)$ — Γ_{132}/Γ_{67}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
7.68±0.41±0.32	670 ± 35	LINK	01C	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma(K^*(892)^+\overline{K}^*(892)^0)/\Gamma_{\text{total}}$ — Γ_{141}/Γ

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

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

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.004	90	ALBRECHT	92B	ARG	$e^+e^- \simeq$ 10.4 GeV

$\Gamma(K^+K^-\pi^+\pi^+\pi^-)/\Gamma(K^-3\pi^+\pi^-)$ — Γ_{135}/Γ_{74}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.040±0.009±0.019	38	LINK	03D	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV

Doubly Cabibbo-suppressed modes

$\Gamma(K^+\pi^0)/\Gamma_{total}$ — Γ_{142}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
2.37±0.32 OUR AVERAGE						
2.52±0.47±0.26		189 ± 37	AUBERT,B	06F	BABR	$e^+e^- \approx \Upsilon(4S)$
2.28±0.36±0.17		148 ± 23	DYTMAN	06	CLEO	e^+e^- at $\psi(3770)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<4.2	90		ARMS	04	CLEO	$e^+e^- \approx$ 10 GeV

$\Gamma(K^+\pi^+\pi^-)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{143}/Γ_{46}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0068±0.0008 OUR AVERAGE					
0.0065±0.0008±0.0004	189 ± 24	LINK	04F	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV
0.0077±0.0017±0.0008	59 ± 13	AITALA	97C	E791	π^- A, 500 GeV
0.0072±0.0023±0.0017	21	FRABETTI	95E	E687	γBe, $\overline{E}_\gamma$= 220 GeV

$\Gamma(K^+\rho^0)/\Gamma(K^+\pi^+\pi^-)$ — $\Gamma_{144}/\Gamma_{143}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
0.39 ±0.09 OUR AVERAGE				
0.3943±0.0787±0.0815	LINK	04F	FOCS	Dalitz fit, 189 evts
0.37 ±0.14 ±0.07	AITALA	97C	E791	Dalitz fit, 59 evts

$\Gamma(K^+ f_0(980), f_0(980) \to \pi^+\pi^-)/\Gamma(K^+\pi^+\pi^-)$ — $\Gamma_{146}/\Gamma_{143}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
0.0892±0.0333±0.0412	LINK	04F	FOCS	Dalitz fit, 189 evts

$\Gamma(K^*(892)^0\pi^+, K^*(892)^0 \to K^+\pi^-)/\Gamma(K^+\pi^+\pi^-)$ — $\Gamma_{145}/\Gamma_{143}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
0.47 ±0.08 OUR AVERAGE				
0.5220±0.0684±0.0638	LINK	04F	FOCS	Dalitz fit, 189 evts
0.35 ±0.14 ±0.01	AITALA	97C	E791	Dalitz fit, 59 evts

$\Gamma(K_2^*(1430)^0\pi^+, K_2^*(1430)^0 \to K^+\pi^-)/\Gamma(K^+\pi^+\pi^-)$ — $\Gamma_{147}/\Gamma_{143}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
0.0803±0.0372±0.0391	LINK	04F	FOCS	Dalitz fit, 189 evts

$\Gamma(K^+\pi^+\pi^-$ nonresonant$)/\Gamma(K^+\pi^+\pi^-)$ — $\Gamma_{148}/\Gamma_{143}$

This is the "fit fraction" from the Dalitz-plot analysis.

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.36±0.14±0.07	[68] AITALA	97C	E791	Dalitz fit, 59 evts

[68] LINK 04F, with three times as many events, finds no need for a nonresonant amplitude.

$\Gamma(K^+K^+K^-)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{149}/Γ_{46}

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
9.49±2.17±0.22		65	[69] LINK	02I	FOCS	γ nucleus, $\approx$ 180 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<16	90		[70] FRABETTI	95F	E687	γBe, $\overline{E}_\gamma \approx$ 220 GeV
570 ± 200 ± 70		13	ADAMOVICH	93	WA82	π^- 340 GeV

[69] LINK 02I finds little evidence for ϕK^+ or $f_0(980)K^+$ submodes.

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

$\Gamma(\phi K^+)/\Gamma(\phi\pi^+)$ — $\Gamma_{150}/\Gamma_{136}$

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.021	90		FRABETTI	95F	E687	γBe, $\overline{E}_\gamma \approx$ 220 GeV
$0.058^{+0.032}_{-0.026}\pm0.007$		4	[71] ANJOS	92D	E691	γBe, $\overline{E}_\gamma$ = 145 GeV

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

Rare or forbidden modes

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

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$<7.4 \times 10^{-6}$	90		HE	05A	CLEO	e^+e^- at $\psi(3770)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<5.2 \times 10^{-5}$	90		AITALA	99G	E791	$\pi^- N$ 500 GeV
$<1.1 \times 10^{-4}$	90		FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
$<6.6 \times 10^{-5}$	90		AITALA	96	E791	$\pi^- N$ 500 GeV
$<2.5 \times 10^{-3}$	90		WEIR	90B	MRK2	e^+e^- 29 GeV
$<2.6 \times 10^{-3}$	90	39	HAAS	88	CLEO	e^+e^- 10 GeV

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

This is *not* a test for the $\Delta C = 1$ weak neutral current, but leads to the $\pi^+e^+e^-$ final state.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$(2.7^{+3.6}_{-1.8}\pm0.2) \times 10^{-6}$	2	[72] HE	05A	CLEO	e^+e^- at $\psi(3770)$

[72] This HE 05A result is consistent with the branching fraction for $D^+ \to \phi\pi^+$, $\phi \to K^+K^-$.

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

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<8.8 × 10^{-6}	90		LINK	03F	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<1.5 \times 10^{-5}$	90		AITALA	99G	E791	$\pi^- N$ 500 GeV
$<8.9 \times 10^{-5}$	90		FRABETTI	97B	E687	γ Be, $\overline{E}_\gamma \approx$ 220 GeV
$<1.8 \times 10^{-5}$	90		AITALA	96	E791	$\pi^- N$ 500 GeV
$<2.2 \times 10^{-4}$	90	0	KODAMA	95	E653	π^- emulsion 600 GeV
$<5.9 \times 10^{-3}$	90		WEIR	90B	MRK2	e^+e^- 29 GeV
$<2.9 \times 10^{-3}$	90	36	HAAS	88	CLEO	e^+e^- 10 GeV

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

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

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

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<6.2 × 10^{-6}	90	HE	05A	CLEO	e^+e^- at $\psi(3770)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<2.0 \times 10^{-4}$	90	AITALA	99G	E791	$\pi^- N$ 500 GeV
$<2.0 \times 10^{-4}$	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

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<9.2 × 10^{-6}	90		LINK	03F	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<4.4 \times 10^{-5}$	90		AITALA	99G	E791	$\pi^- N$ 500 GeV
$<9.7 \times 10^{-5}$	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_{157}/Γ

A test of lepton-family-number conservation.

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

$\Gamma(\pi^+e^+\mu^-)/\Gamma_{total}$ Γ_{158}/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_{159}/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_{160}/Γ

A test of lepton-family-number conservation.

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

$\Gamma(K^+ e^+ \mu^-)/\Gamma_{total}$ — 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. • • •					
$<1.3 \times 10^{-4}$	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_{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. • • •					
$<1.2 \times 10^{-4}$	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_{163}/Γ

A test of lepton-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<3.6 \times 10^{-6}$	90	HE	05A	CLEO	$e^+ e^-$ at $\psi(3770)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<9.6 \times 10^{-5}$	90	AITALA	99G	E791	$\pi^- N$ 500 GeV
$<1.1 \times 10^{-4}$	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_{164}/Γ

A test of lepton-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$<4.8 \times 10^{-6}$	90		LINK	03F	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<1.7 \times 10^{-5}$	90		AITALA	99G	E791	$\pi^- N$ 500 GeV
$<8.7 \times 10^{-5}$	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_{165}/Γ

A test of lepton-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<5.0 \times 10^{-5}$	90	AITALA	99G	E791	$\pi^- N$ 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_{166}/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_{167}/Γ

A test of lepton-number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<4.5 \times 10^{-6}$	90	HE	05A	CLEO	$e^+ e^-$ at $\psi(3770)$
• • • 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
$<9.1 \times 10^{-3}$	90	WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

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

A test of lepton-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$<1.3 \times 10^{-5}$	90		LINK	03F	FOCS	γ nucleus,$\overline{E}_\gamma \approx$ 180 GeV
• • • 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
$<3.2 \times 10^{-4}$	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_{169}/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_{170}/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±0.015±0.009	10.6k	[73] LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

[73] 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±0.061±0.012	949	[74] 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±0.060±0.015	949	[75] LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

[74] 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^-.

[75] 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
0.007±0.008 OUR AVERAGE					
+0.014±0.010±0.008	43k±321	[76] AUBERT	05S	BABR	$e^+e^- \approx \Upsilon(4S)$
+0.006±0.011±0.005	14k	[77] LINK	00B	FOCS	
−0.014±0.029		[77] AITALA	97B	E791	$-0.062 < A_{CP} < +0.034$ (90% CL)
−0.031±0.068		[77] FRABETTI	94I	E687	$-0.14 < A_{CP} < +0.081$ (90% CL)

[76] AUBERT 05S measures $N(D^+ \to K^+K^-\pi^+)/N(D^+_s \to K^+K^-\pi^+)$, the ratio of the numbers of events observed, and similarly for the D^-.

[77] 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	EVTS	DOCUMENT ID		TECN	COMMENT
0.005±0.017 OUR AVERAGE					
+0.009±0.017±0.007	11k±122	[78] AUBERT	05S	BABR	$e^+e^- \approx \Upsilon(4S)$
−0.010±0.050		[79] AITALA	97B	E791	$-0.092 < A_{CP} < +0.072$ (90% CL)
−0.12 ±0.13		[79] FRABETTI	94I	E687	$-0.33 < A_{CP} < +0.094$ (90% CL)

[78] AUBERT 05S measures $N(D^+ \rightarrow K^+ \overline{K}^{*0})/N(D_s^+ \rightarrow K^+ K^- \pi^+)$, the ratio of the numbers of events observed, and similarly for the D^-.

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

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

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
−0.001±0.015 OUR AVERAGE					
+0.002±0.015±0.006	10k±136	[80] AUBERT	05S	BABR	$e^+e^- \approx \Upsilon(4S)$
−0.028±0.036		[81] AITALA	97B	E791	$-0.087 < A_{CP} < +0.031$ (90% CL)
+0.066±0.086		[81] FRABETTI	94I	E687	$-0.075 < A_{CP} < +0.21$ (90% CL)

[80] AUBERT 05S measures $N(D^+ \rightarrow \phi\pi^+)/N(D_s^+ \rightarrow K^+ K^- \pi^+)$, the ratio of the numbers of events observed, and similarly for the D^-.

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

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

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

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

$A_{CP}(K_S^0 K^\pm \pi^+\pi^-)$ in $D^\pm \rightarrow K_S^0 K^\pm \pi^+\pi^-$

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
−0.042±0.064±0.022	523 ± 32	LINK	05E	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV

D^+-D^- T-VIOLATING DECAY-RATE ASYMMETRIES

$A_{Tviol}(K_S^0 K^\pm \pi^+\pi^-)$ in $D^\pm \rightarrow K_S^0 K^\pm \pi^+\pi^-$

$C_T \equiv \vec{p}_{K^+} \cdot (\vec{p}_{\pi^+} \times \vec{p}_{\pi^-})$ is a T-odd correlation of the K^+, π^+, and π^- momenta for the D^+. $\overline{C}_T \equiv \vec{p}_{K^-} \cdot (\vec{p}_{\pi^-} \times \vec{p}_{\pi^+})$ is the corresponding quantity for the D^-. $A_T \equiv [\Gamma(C_T > 0) - \Gamma(C_T < 0)] / [\Gamma(C_T > 0) + \Gamma(C_T < 0)]$ would, in the absence of strong phases, test for T violation in D^+ decays (the Γ's are partial widths). With $\overline{A}_T \equiv [\Gamma(-\overline{C}_T > 0) - \Gamma(-\overline{C}_T < 0)] / [\Gamma(-\overline{C}_T > 0) + \Gamma(-\overline{C}_T < 0)]$, the asymmetry $A_{Tviol} \equiv \frac{1}{2}(A_T - \overline{A}_T)$ tests for T violation even with nonzero strong phases.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
+0.023±0.062±0.022	523 ± 32	LINK	05E	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV

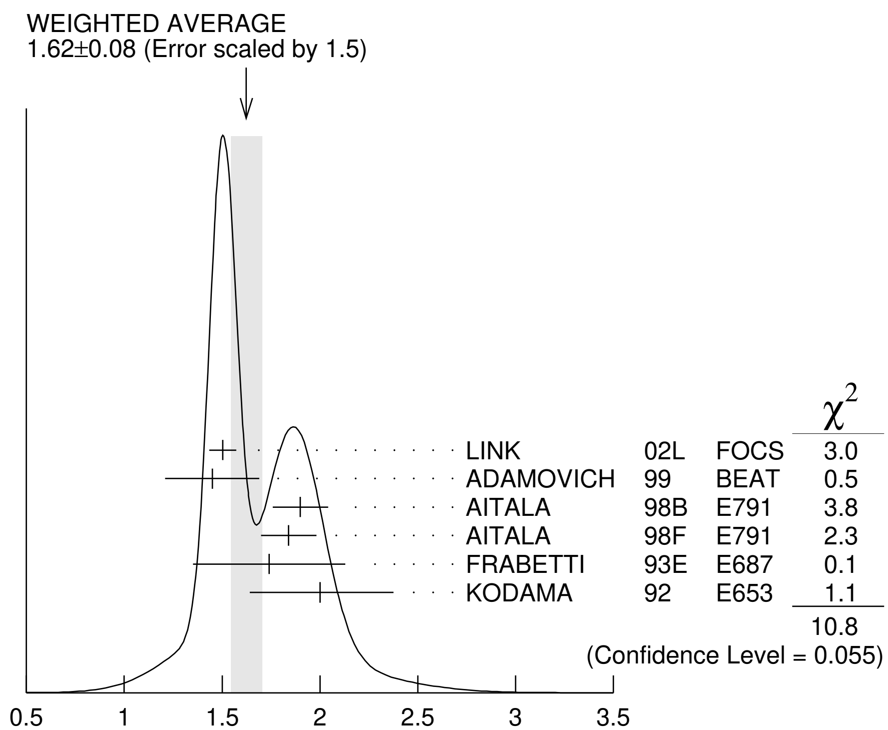
$D^+ \to \overline{K}^*(892)^0 \ell^+ \nu_\ell$ FORM FACTORS

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.62 ±0.08 OUR AVERAGE		Error includes scale factor of 1.5. See the ideogram below.			
1.504±0.057±0.039	15k	[83] LINK	02L	FOCS	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
1.45 ±0.23 ±0.07	763	ADAMOVICH	99	BEAT	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
1.90 ±0.11 ±0.09	3000	[84] 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 $^{+0.34}_{-0.32}$ ±0.16	305	KODAMA	92	E653	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.0 ±0.6 ±0.3	183	ANJOS	90E	E691	$\overline{K}^*(892)^0 e^+ \nu_e$

[83] LINK 02L includes the effects of interference with an S-wave background. This much improves the goodness of fit, but does not much shift the values of the form factors.

[84] 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
0.83 ±0.05 OUR AVERAGE					
0.875±0.049±0.064	15k	[85] LINK	02L	FOCS	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
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 $\pm$0.08 $\pm$0.09	3034	AITALA	98F	E791	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
0.78 $\pm$0.18 $\pm$0.10	874	FRABETTI	93E	E687	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
0.82 $^{+0.22}_{-0.23}$ $\pm$0.11	305	KODAMA	92	E653	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.0 $\pm$0.5 $\pm$0.2	183	ANJOS	90E	E691	$\overline{K}^*(892)^0 e^+ \nu_e$

[85] LINK 02L includes the effects of interference with an S-wave background. This much improves the goodness of fit, but does not much shift the values of the form factors.

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

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.13$\pm$0.08 OUR AVERAGE					
1.09$\pm$0.10$\pm$0.02	763	ADAMOVICH	99	BEAT	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
1.20$\pm$0.13$\pm$0.13	874	FRABETTI	93E	E687	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
1.18$\pm$0.18$\pm$0.08	305	KODAMA	92	E653	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.8 $^{+0.6}_{-0.4}$ $\pm$0.3	183	ANJOS	90E	E691	$\overline{K}^*(892)^0 e^+ \nu_e$

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.22$\pm$0.06 OUR AVERAGE Error includes scale factor of 1.6.					
0.28$\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	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.15$^{+0.07}_{-0.05}$$\pm$0.03	183	ANJOS	90E	E691	$\overline{K}^*(892)^0 e^+ \nu_e$

$D^\pm$ REFERENCES

ABLIKIM	07	PL B644 20	M. Ablikim et al.	(BES Collab.)
ABLIKIM	06O	EPJ C47 31	M. Ablikim et al.	(BES Collab.)
ABLIKIM	06P	EPJ C47 39	M. Ablikim et al.	(BES Collab.)
ABLIKIM	06U	PL B643 246	M. Ablikim et al.	(BES Collab.)
ADAM	06A	PRL 97 251801	N.E. Adam et al.	(CLEO Collab.)
AITALA	06	PR D73 032004	E.M. Aitala et al.	(FNAL E791 Collab.)
Also		PR D74 059901 (Errat.)	E.M. Aitala et al.	(FNAL E791 Collab.)
AUBERT,B	06F	PR D74 011107R	B. Aubert et al.	(BABAR Colla.b)
DYTMAN	06	PR D74 071102R	S.A. Dytman et al.	(CLEO Collab.)
HUANG	06B	PR D74 112005	G.S. Huang et al.	(CLEO Collab.)
LINK	06B	PL B637 32	J.M. Link et al.	(FNAL FOCUS Collab.)
PDG	06	JPG 33 1	W.-M. Yao et al.	(PDG Collab.)
RUBIN	06	PRL 96 081802	P. Rubin et al.	(CLEO Collab.)
RUBIN	06A	PR D73 112005	P. Rubin et al.	(CLEO Collab.)
ABLIKIM	05A	PL B608 24	M. Ablikim et al.	(BES Collab.)
ABLIKIM	05D	PL B610 183	M. Ablikim et al.	(BES Collab.)
ABLIKIM	05F	PL B622 6	M. Ablikim et al.	(BES Collab.)
ABLIKIM	05P	PL B625 196	M. Ablikim et al.	(BES Collab.)
ARTUSO	05A	PRL 95 251801	M. Artuso et al.	(CLEO Collab.)
AUBERT	05S	PR D71 091101R	B. Aubert et al.	(BABAR Collab.)

HE	05	PRL 95 121801	Q. He *et al.*	(CLEO Collab.)
Also		PRL 96 199903 (errat.)	Q. He *et al.*	(CLEO Collab.)
HE	05A	PRL 95 221802	Q. He *et al.*	(CLEO Collab.)
HUANG	05B	PRL 95 181801	G.S. Huang *et al.*	(CLEO Collab.)
KAYIS-TOPAK...	05	PL B626 24	A. Kayis-Topaksu *et al.*	(CERN CHORUS Collab.)
LINK	05E	PL B622 239	J.M. Link *et al.*	(FNAL FOCUS Collab.)
LINK	05I	PL B621 72	J.M. Link *et al.*	(FNAL FOCUS Collab.)
ABLIKIM	04C	PL B597 39	M. Ablikim *et al.*	(BEPC BES Collab.)
ARMS	04	PR D69 071102R	K. Arms *et al.*	(CLEO Collab.)
BONVICINI	04A	PR D70 112004	G. Bonvicini *et al.*	(CLEO Collab.)
LINK	04	PL B585 200	J.M. Link *et al.*	(FNAL FOCUS Collab.)
LINK	04E	PL B598 33	J.M. Link *et al.*	(FNAL FOCUS Collab.)
LINK	04F	PL B601 10	J.M. Link *et al.*	(FNAL FOCUS Collab.)
ANISOVICH	03	EPJ A16 229	V.V. Anisovich *et al.*	
LINK	03D	PL B561 225	J.M. Link *et al.*	(FNAL FOCUS Collab.)
LINK	03F	PL B572 21	J.M. Link *et al.*	(FNAL FOCUS Collab.)
AITALA	02	PRL 89 121801	E.M. Aitala *et al.*	(FNAL E791 Collab.)
BRANDENB...	02	PRL 89 222001	G. Brandenburg *et al.*	(CLEO Collab.)
KAYIS-TOPAK...	02	PL B549 48	A. Kayis-Topaksu *et al.*	(CERN CHORUS Collab.)
LINK	02B	PRL 88 041602	J.M. Link *et al.*	(FNAL FOCUS Collab.)
Also		PRL 88 159903 (erratum)	J.M. Link *et al.*	(FNAL FOCUS Collab.)
LINK	02E	PL B535 43	J.M. Link *et al.*	(FNAL FOCUS Collab.)
LINK	02F	PL B537 192	J.M. Link *et al.*	(FNAL FOCUS Collab.)
LINK	02I	PL B541 227	J.M. Link *et al.*	(FNAL FOCUS Collab.)
LINK	02J	PL B541 243	J.M. Link *et al.*	(FNAL FOCUS Collab.)
LINK	02L	PL B544 89	J.M. Link *et al.*	(FNAL FOCUS Collab.)
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		PL B495 443 (erratum)	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.)
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	A.N. Aleev *et al.*	(Serpukhov BIS-2 Collab.)
		Translated from YF 57 1443.		
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.)
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		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.)
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	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	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	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		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		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.)
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.)
DERRICK	84	PRL 53 1971	M. Derrick *et al.*	(HRS 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.)
ZHOLENTZ	80	PL 96B 214	A.A. Zholents *et al.*	(NOVO)
Also		SJNP 34 814	A.A. Zholents *et al.*	(NOVO)
		Translated from YAF 34 1471.		
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.)
PERUZZI	76	PRL 37 569	I. Peruzzi *et al.*	(Mark I Collab.)

OTHER RELATED PAPERS

RICHMAN	95	RMP 67 893	J.D. Richman, P.R. Burchat	(UCSB, STAN)
ROSNER	95	CNPP 21 369	J. Rosner	(CHIC)