$D^{\pm}$

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

$D^{\pm}$ MASS

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

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1869.3± 0.4 OUR FIT	Error includes scale factor of 1.1.				
1869.4± 0.5 OUR AVERAGE					
1870.0± 0.5±1.0	317	BARLAG	90C	ACCM	π^- Cu 230 GeV
1863 ± 4		DERRICK	84	HRS	e^+e^- 29 GeV
1869.4± 0.6		[1] TRILLING	81	RVUE	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1875 ±10	9	ADAMOVICH	87	EMUL	Photoproduction
1860 ±16	6	ADAMOVICH	84	EMUL	Photoproduction
1868.4± 0.5		[1] SCHINDLER	81	MRK2	e^+e^- 3.77 GeV
1874 ± 5		GOLDHABER	77	MRK1	D^0, D^+ recoil spectra
1868.3± 0.9		[1] PERUZZI	77	MRK1	e^+e^- 3.77 GeV
1874 ±11		PICCOLO	77	MRK1	e^+e^- 4.03, 4.41 GeV
1876 ±15	50	PERUZZI	76	MRK1	$K^{\mp}\pi^{\pm}\pi^{\pm}$

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

$D^{\pm}$ MEAN LIFE

Measurements with an error $> 100 \times 10^{-15}$ s have been omitted from the Listings.

VALUE (10^{-15} s)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1040 ± 7 OUR AVERAGE					
1039.4± 4.3± 7.0	110k	LINK	02F	FOCS	γ nucleus, ≈ 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	$D^+ \rightarrow K^-\pi^+\pi^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1075 ±40 ±18	2455	FRABETTI	91	E687	γ Be, $D^+ \rightarrow K^-\pi^+\pi^+$
1030 ±80 ±60	200	ALVAREZ	90	NA14	γ, $D^+ \rightarrow K^-\pi^+\pi^+$
$1050\ ^{+77}_{-72}$	317	[2] BARLAG	90C	ACCM	π^- Cu 230 GeV
1050 ±80 ±70	363	ALBRECHT	88I	ARG	e^+e^- 10 GeV
1090 ±30 ±25	2992	RAAB	88	E691	Photoproduction

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

D^+ DECAY MODES

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

	Mode		Fraction (Γ_i/Γ)	Scale factor/ Confidence level
	Inclusive modes			
Γ_1	e^+ anything		(17.2 ± 1.9) %	
Γ_2	K^- anything		(27.5 ± 2.4) %	
Γ_3	$\overline{K}^0$ anything + K^0 anything		(61 ± 8) %	
Γ_4	K^+ anything		(5.5 ± 1.6) %	
Γ_5	η anything	[a]	< 13 %	CL=90%
Γ_6	ϕ anything		< 1.8 %	CL=90%
Γ_7	ϕe^+ anything		< 1.6 %	CL=90%
Γ_8	μ^+ anything			
	Leptonic and semileptonic modes			
Γ_9	$\mu^+ \nu_\mu$		$(3.8 \pm 1.5) \times 10^{-4}$	
Γ_{10}	$\overline{K}^0 \ell^+ \nu_\ell$	[b]	(8.2 ± 1.1) %	S=1.8
Γ_{11}	$\overline{K}^0 e^+ \nu_e$		(7.2 ± 0.8) %	
Γ_{12}	$\overline{K}^0 \mu^+ \nu_\mu$		(9.1 ± 0.9) %	S=1.1
Γ_{13}	$K^- \pi^+ e^+ \nu_e$		$(4.5 ^{+1.0}_{-0.8})$ %	S=1.2
Γ_{14}	$\overline{K}^*(892)^0 e^+ \nu_e$, $\overline{K}^*(892)^0 \to K^- \pi^+$		(3.7 ± 0.5) %	
Γ_{15}	$K^- \pi^+ e^+ \nu_e$ nonresonant		$< 7 \times 10^{-3}$	CL=90%
Γ_{16}	$K^- \pi^+ \mu^+ \nu_\mu$		(3.8 ± 0.5) %	
Γ_{17}	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$, $\overline{K}^*(892)^0 \to K^- \pi^+$		(3.5 ± 0.3) %	
Γ_{18}	$K^- \pi^+ \mu^+ \nu_\mu$ nonresonant			
Γ_{19}	$\overline{K}^0 \pi^+ \pi^- e^+ \nu_e$			
Γ_{20}	$K^- \pi^+ \pi^0 e^+ \nu_e$			
Γ_{21}	$(\overline{K}^*(892)\pi)^0 e^+ \nu_e$		< 1.2 %	CL=90%
Γ_{22}	$(\overline{K}\pi\pi)^0 e^+ \nu_e$ non-$\overline{K}^*(892)$		$< 9 \times 10^{-3}$	CL=90%
Γ_{23}	$K^- \pi^+ \pi^0 \mu^+ \nu_\mu$		$< 1.6 \times 10^{-3}$	CL=90%
Γ_{24}	$\pi^0 \ell^+ \nu_\ell$	[c]	$(3.8 \pm 1.9) \times 10^{-3}$	
Γ_{25}	$\pi^+ \pi^- e^+ \nu_e$			

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

	Mode		Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_{26}	$\overline{K}^*(892)^0 \ell^+ \nu_\ell$	[b]	(5.6 ± 0.4) %	
Γ_{27}	$\overline{K}^*(892)^0 e^+ \nu_e$		(5.5 ± 0.7) %	S=1.5
Γ_{28}	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$		(5.3 ± 0.5) %	S=1.1
Γ_{29}	$\overline{K}_1(1270)^0 \mu^+ \nu_\mu$		< 4 %	CL=95%
Γ_{30}	$\overline{K}^*(1410)^0 \mu^+ \nu_\mu$			

Γ_{31}	$\overline{K}_2^*(1430)^0 \mu^+ \nu_\mu$		$<$ 1.0	%	CL=95%
Γ_{32}	$\rho^0 e^+ \nu_e$		(2.5 $\pm$1.0)	$\times 10^{-3}$	
Γ_{33}	$\rho^0 \mu^+ \nu_\mu$		(3.3 $\pm$0.8)	$\times 10^{-3}$	
Γ_{34}	$\phi e^+ \nu_e$		$<$ 2.09	%	CL=90%
Γ_{35}	$\phi \mu^+ \nu_\mu$		$<$ 3.72	%	CL=90%
Γ_{36}	$\eta \ell^+ \nu_\ell$		$<$ 6	$\times 10^{-3}$	CL=90%
Γ_{37}	$\eta'(958) \mu^+ \nu_\mu$		$<$ 1.1	%	CL=90%

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

Γ_{38}	$\overline{K}^0 \pi^+$		(2.83$\pm$0.18)	%	S=1.1
Γ_{39}	$K^- \pi^+ \pi^+$	[d]	(9.2 $\pm$0.6)	%	S=1.1
Γ_{40}	$\overline{K}_0^*(800)^0 \pi^+$, $\overline{K}_0^*(800) \to K^- \pi^+$				
Γ_{41}	$\overline{K}^*(892)^0 \pi^+$, $\overline{K}^*(892)^0 \to K^- \pi^+$		(1.29$\pm$0.12)	%	
Γ_{42}	$\overline{K}_0^*(1430)^0 \pi^+$, $\overline{K}_0^*(1430)^0 \to K^- \pi^+$		(2.33$\pm$0.26)	%	
Γ_{43}	$\overline{K}_2^*(1430)^0 \pi^+$, $\overline{K}_2^*(1430)^0 \to K^- \pi^+$				
Γ_{44}	$\overline{K}^*(1680)^0 \pi^+$, $\overline{K}^*(1680)^0 \to K^- \pi^+$		(3.8 $\pm$0.8)	$\times 10^{-3}$	
Γ_{45}	$K^- \pi^+ \pi^+$ nonresonant		(8.8 $\pm$0.9)	%	
Γ_{46}	$\overline{K}^0 \pi^+ \pi^0$	[d]	(10.7 $\pm$2.9)	%	
Γ_{47}	$\overline{K}^0 \rho^+$		(7.3 $\pm$2.5)	%	
Γ_{48}	$\overline{K}^*(892)^0 \pi^+$, $\overline{K}^*(892)^0 \to \overline{K}^0 \pi^0$		(2.0 $\pm$1.1)	%	
Γ_{49}	$\overline{K}^0 \pi^+ \pi^0$ nonresonant		(1.4 $\pm$1.2)	%	
Γ_{50}	$K^- \pi^+ \pi^+ \pi^0$	[d]	(6.5 $\pm$1.1)	%	
Γ_{51}	$\overline{K}^*(892)^0 \rho^+$ total, $\overline{K}^*(892)^0 \to K^- \pi^+$		(1.4 $\pm$0.9)	%	
Γ_{52}	$\overline{K}_1(1400)^0 \pi^+$, $\overline{K}_1(1400)^0 \to K^- \pi^+ \pi^0$		(2.2 $\pm$0.6)	%	
Γ_{53}	$K^- \rho^+ \pi^+$ total		(3.1 $\pm$1.1)	%	
Γ_{54}	$K^- \rho^+ \pi^+$ 3-body		(1.1 $\pm$0.4)	%	
Γ_{55}	$\overline{K}^*(892)^0 \pi^+ \pi^0$ total, $\overline{K}^*(892)^0 \to K^- \pi^+$		(4.5 $\pm$0.9)	%	
Γ_{56}	$\overline{K}^*(892)^0 \pi^+ \pi^0$ 3-body, $\overline{K}^*(892)^0 \to K^- \pi^+$		(2.9 $\pm$0.9)	%	
Γ_{57}	$K^*(892)^- \pi^+ \pi^+$ 3-body, $K^*(892)^- \to K^- \pi^0$		(7 $\pm$3)	$\times 10^{-3}$	
Γ_{58}	$K^- \pi^+ \pi^+ \pi^0$ nonresonant	[e]	(1.2 $\pm$0.6)	%	
Γ_{59}	$\overline{K}^0 \pi^+ \pi^+ \pi^-$	[d]	(7.1 $\pm$1.0)	%	
Γ_{60}	$\overline{K}^0 a_1(1260)^+$, $a_1(1260)^+ \to \pi^+ \pi^+ \pi^-$		(4.0 $\pm$0.9)	%	

Γ_{61}	$\overline{K}_1(1400)^0\pi^+$, $\overline{K}_1(1400)^0 \to \overline{K}^0\pi^+\pi^-$		(2.2 ±0.6) %	
Γ_{62}	$K^*(892)^-\pi^+\pi^+$ 3-body, $K^*(892)^- \to \overline{K}^0\pi^-$		(1.4 ±0.6) %	
Γ_{63}	$\overline{K}^0\rho^0\pi^+$ total		(4.3 ±0.9) %	
Γ_{64}	$\overline{K}^0\rho^0\pi^+$ 3-body		(5 ±5) $\times 10^{-3}$	
Γ_{65}	$\overline{K}^0\pi^+\pi^+\pi^-$ nonresonant		(9 ±4) $\times 10^{-3}$	
Γ_{66}	$K^-3\pi^+\pi^-$	[d]	(5.9 ±0.7) $\times 10^{-3}$	S=1.2
Γ_{67}	$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$, $\overline{K}^*(892)^0 \to K^-\pi^+$		(1.3 ±0.5) $\times 10^{-3}$	
Γ_{68}	$\overline{K}^*(892)^0\rho^0\pi^+$, $\overline{K}^*(892)^0 \to K^-\pi^+$		(2.1 ±0.5) $\times 10^{-3}$	
Γ_{69}	$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$ no-ρ, $\overline{K}^*(892)^0 \to K^-\pi^+$		(2.9 ±1.1) $\times 10^{-3}$	
Γ_{70}	$K^-\rho^0\pi^+\pi^+$		(1.84±0.32) $\times 10^{-3}$	S=1.1
Γ_{71}	$K^-3\pi^+\pi^-$ nonresonant		(4.1 ±3.0) $\times 10^{-4}$	
Γ_{72}	$K^-2\pi^+2\pi^0$			
Γ_{73}	$\overline{K}^0 2\pi^+\pi^-\pi^0$			
Γ_{74}	$\overline{K}^0 3\pi^+2\pi^-$			
Γ_{75}	$K^-3\pi^+\pi^-\pi^0$			
Γ_{76}	$\overline{K}^0\overline{K}^0K^+$		(1.8 ±0.8) %	
Γ_{77}	$K^+K^-\overline{K}^0\pi^+$		(5.5 ±1.4) $\times 10^{-4}$	

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

Γ_{78}	$\overline{K}^0a_1(1260)^+$		(8.2 ±1.7) %	
Γ_{79}	$\overline{K}^0a_2(1320)^+$		< 3 $\times 10^{-3}$	CL=90%
Γ_{80}	$\overline{K}^*(892)^0\rho^+$ total	[e]	(2.1 ±1.4) %	
Γ_{81}	$\overline{K}^*(892)^0\rho^+$ *S*-wave	[e]	(1.7 ±1.6) %	
Γ_{82}	$\overline{K}^*(892)^0\rho^+$ *P*-wave		< 1 $\times 10^{-3}$	CL=90%
Γ_{83}	$\overline{K}^*(892)^0\rho^+$ *D*-wave		(10 ±7) $\times 10^{-3}$	
Γ_{84}	$\overline{K}^*(892)^0\rho^+$ *D*-wave longitudinal		< 7 $\times 10^{-3}$	CL=90%
Γ_{85}	$\overline{K}_1(1270)^0\pi^+$		< 7 $\times 10^{-3}$	CL=90%
Γ_{86}	$\overline{K}_1(1400)^0\pi^+$		(5.0 ±1.3) %	
Γ_{87}	$\overline{K}^*(1410)^0\pi^+$			
Γ_{88}	$\overline{K}^*(892)^0\pi^+\pi^0$ total		(6.8 ±1.4) %	
Γ_{89}	$\overline{K}^*(892)^0\pi^+\pi^0$ 3-body	[e]	(4.3 ±1.4) %	
Γ_{90}	$K^*(892)^-\pi^+\pi^+$ total		—	
Γ_{91}	$K^*(892)^-\pi^+\pi^+$ 3-body		(2.1 ±0.9) %	
Γ_{92}	$K^-\rho^+\pi^+$ total		(3.1 ±1.1) %	
Γ_{93}	$K^-\rho^+\pi^+$ 3-body		(1.1 ±0.4) %	
Γ_{94}	$\overline{K}^0\rho^0\pi^+$ total		(4.3 ±0.9) %	CL=90%
Γ_{95}	$\overline{K}^0\rho^0\pi^+$ 3-body		(5 ±5) $\times 10^{-3}$	

Γ_{96}	$\overline{K}^0 f_0(980)\pi^+$			
Γ_{97}	$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$		$(1.9 \pm 0.7) \times 10^{-3}$	
Γ_{98}	$\quad\overline{K}^*(892)^0\rho^0\pi^+$		$(3.2 \pm 0.7) \times 10^{-3}$	S=1.1
Γ_{99}	$\quad\overline{K}^*(892)^0\pi^+\pi^+\pi^-$ no-ρ		$(4.4 \pm 1.7) \times 10^{-3}$	
Γ_{100}	$K^-\rho^0\pi^+\pi^+$		$(1.84 \pm 0.32) \times 10^{-3}$	
Γ_{101}	$\quad\overline{K}^*(892)^0 a_1(1260)^+$		$(9.1 \pm 1.9) \times 10^{-3}$	

Pionic modes

Γ_{102}	$\pi^+\pi^0$		$(1.33 \pm 0.22) \times 10^{-3}$	
Γ_{103}	$\pi^+\pi^+\pi^-$		$(3.1 \pm 0.4) \times 10^{-3}$	
Γ_{104}	$\quad\pi^+(\pi^+\pi^-)_{S-\text{wave}}$		$(1.76^{+0.24}_{-0.27}) \times 10^{-3}$	
Γ_{105}	$\quad\quad\sigma\pi^+$, $\sigma \to \pi^+\pi^-$			
Γ_{106}	$\quad\quad f_0(980)\pi^+$, $f_0(980) \to \pi^+\pi^-$			
Γ_{107}	$\quad\quad f_0(1370)\pi^+$, $f_0(1370) \to \pi^+\pi^-$			
Γ_{108}	$\quad\rho^0\pi^+$		$(9.7 \pm 1.7) \times 10^{-4}$	
Γ_{109}	$\quad f_2(1270)\pi^+$, $f_2(1270) \to \pi^+\pi^-$		$(3.7 \pm 0.8) \times 10^{-4}$	
Γ_{110}	$\quad\rho(1450)^0\pi^+$, $\rho(1450)^0 \to \pi^+\pi^-$			
Γ_{111}	$\quad\pi^+\pi^+\pi^-$ nonresonant			
Γ_{112}	$\pi^+\pi^+\pi^-\pi^0$		—	
Γ_{113}	$\quad\eta\pi^+$, $\eta \to \pi^+\pi^-\pi^0$		$(6.8 \pm 1.4) \times 10^{-4}$	
Γ_{114}	$\quad\omega\pi^+$, $\omega \to \pi^+\pi^-\pi^0$		$< 6 \times 10^{-3}$	CL=90%
Γ_{115}	$3\pi^+ 2\pi^-$		$(1.73 \pm 0.23) \times 10^{-3}$	S=1.1
Γ_{116}	$3\pi^+ 2\pi^- \pi^0$			

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

Γ_{117}	$\eta\pi^+$			
Γ_{118}	$\rho^0\pi^+$		$(1.05 \pm 0.18) \times 10^{-3}$	
Γ_{119}	$\omega\pi^+$		$< 7 \times 10^{-3}$	CL=90%
Γ_{120}	$\eta\rho^+$			
Γ_{121}	$\eta'(958)\pi^+$			
Γ_{122}	$\eta'(958)\rho^+$			

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

Γ_{123}	$K^+\overline{K}^0$		$(5.7 \pm 0.5) \times 10^{-3}$	
Γ_{124}	$K^+K^-\pi^+$	[d]	$(8.9 \pm 0.8) \times 10^{-3}$	
Γ_{125}	$\quad\phi\pi^+$, $\phi \to K^+K^-$		(2.7 ± 0.4) %	
Γ_{126}	$\quad K^+\overline{K}^*(892)^0$, $\overline{K}^*(892)^0 \to K^-\pi^+$		(2.77 ± 0.34) %	
Γ_{127}	$\quad K^+\overline{K}^*_0(1430)^0$, $\overline{K}^*_0(1430)^0 \to K^-\pi^+$		(3.4 ± 0.4) %	

Γ_{128}	$K^+K^-\pi^+$ nonresonant			
Γ_{129}	$K^0\overline{K}^0\pi^+$		—	
Γ_{130}	$K^*(892)^+\overline{K}^0$, $K^*(892)^+ \to K^0\pi^+$		(2.1 ±0.9) %	
Γ_{131}	$K^+K^-\pi^+\pi^0$		—	
Γ_{132}	$\phi\pi^+\pi^0$, $\phi \to K^+K^-$		(1.1 ±0.5) %	
Γ_{133}	$\phi\rho^+$, $\phi \to K^+K^-$		< 7 $\times 10^{-3}$	CL=90%
Γ_{134}	$K^+K^-\pi^+\pi^0$ non-ϕ		(1.5 $^{+0.7}_{-0.6}$) %	
Γ_{135}	$K^+\overline{K}^0\pi^+\pi^-$		(4.0 ±0.7) $\times 10^{-3}$	
Γ_{136}	$K^0K^-\pi^+\pi^+$		(5.5 ±0.8) $\times 10^{-3}$	
Γ_{137}	$K^*(892)^+\overline{K}^*(892)^0$, $K^{*+} \to K^0\pi^+$, $\overline{K}^{*0} \to K^-\pi^+$		(1.2 ±0.5) %	
Γ_{138}	$K^0K^-\pi^+\pi^+$ (non-$K^{*+}\overline{K}^{*0}$)		< 7.9 $\times 10^{-3}$	CL=90%
Γ_{139}	$K^+K^-\pi^+\pi^+\pi^-$		(2.3 ±1.3) $\times 10^{-4}$	
Γ_{140}	$K^+K^-\pi^+\pi^+\pi^-$ nonresonant			

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

Γ_{141}	$\phi\pi^+$			
Γ_{142}	$\phi\pi^+\pi^0$		(2.3 ±1.0) %	
Γ_{143}	$\phi\rho^+$		< 1.5 %	CL=90%
Γ_{144}	$\phi\pi^+\pi^+\pi^-$			
Γ_{145}	$K^+\overline{K}^*(892)^0$			
Γ_{146}	$K^*(892)^+\overline{K}^0$		(3.1 ±1.4) %	
Γ_{147}	$K^*(892)^+\overline{K}^*(892)^0$		(2.6 ±1.1) %	

Doubly Cabibbo suppressed modes

Γ_{148}	$K^+\pi^0$		< 4.2 $\times 10^{-4}$	CL=90%
Γ_{149}	$K^+\pi^+\pi^-$		(6.2 ±0.8) $\times 10^{-4}$	
Γ_{150}	$K^+\rho^0$		(2.4 ±0.7) $\times 10^{-4}$	
Γ_{151}	$K^*(892)^0\pi^+$, $K^*(892)^0 \to K^+\pi^-$		(2.9 ±0.6) $\times 10^{-4}$	
Γ_{152}	$K^+f_0(980)$, $f_0(980) \to \pi^+\pi^-$		(5.6 ±3.4) $\times 10^{-5}$	
Γ_{153}	$K_2^*(1430)^0\pi^+$, $K_2^*(1430)^0 \to K^+\pi^-$		(5.0 ±3.4) $\times 10^{-5}$	
Γ_{154}	$K^+\pi^+\pi^-$ nonresonant			
Γ_{155}	$K^+K^+K^-$		(8.7 ±2.1) $\times 10^{-5}$	
Γ_{156}	ϕK^+	[f]		

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

Γ_{157}	$\pi^+ e^+ e^-$	$C1$		< 5.2	$\times 10^{-5}$	CL=90%
Γ_{158}	$\pi^+ \mu^+ \mu^-$	$C1$		< 8.8	$\times 10^{-6}$	CL=90%
Γ_{159}	$\rho^+ \mu^+ \mu^-$	$C1$		< 5.6	$\times 10^{-4}$	CL=90%
Γ_{160}	$K^+ e^+ e^-$		[g]	< 2.0	$\times 10^{-4}$	CL=90%
Γ_{161}	$K^+ \mu^+ \mu^-$		[g]	< 9.2	$\times 10^{-6}$	CL=90%
Γ_{162}	$\pi^+ e^\pm \mu^\mp$	LF	[h]	< 3.4	$\times 10^{-5}$	CL=90%
Γ_{163}	$\pi^+ e^+ \mu^-$					
Γ_{164}	$\pi^+ e^- \mu^+$					
Γ_{165}	$K^+ e^\pm \mu^\mp$	LF	[h]	< 6.8	$\times 10^{-5}$	CL=90%
Γ_{166}	$K^+ e^+ \mu^-$					
Γ_{167}	$K^+ e^- \mu^+$					
Γ_{168}	$\pi^- e^+ e^+$	L		< 9.6	$\times 10^{-5}$	CL=90%
Γ_{169}	$\pi^- \mu^+ \mu^+$	L		< 4.8	$\times 10^{-6}$	CL=90%
Γ_{170}	$\pi^- e^+ \mu^+$	L		< 5.0	$\times 10^{-5}$	CL=90%
Γ_{171}	$\rho^- \mu^+ \mu^+$	L		< 5.6	$\times 10^{-4}$	CL=90%
Γ_{172}	$K^- e^+ e^+$	L		< 1.2	$\times 10^{-4}$	CL=90%
Γ_{173}	$K^- \mu^+ \mu^+$	L		< 1.3	$\times 10^{-5}$	CL=90%
Γ_{174}	$K^- e^+ \mu^+$	L		< 1.3	$\times 10^{-4}$	CL=90%
Γ_{175}	$K^*(892)^- \mu^+ \mu^+$	L		< 8.5	$\times 10^{-4}$	CL=90%

Γ_{176}	A dummy mode used by the fit.	(34 ± 5) %	S=1.1

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

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

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

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

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

[f] Unseen decay modes of the resonance are included.

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

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

CONSTRAINED FIT INFORMATION

An overall fit to 30 branching ratios uses 49 measurements and one constraint to determine 17 parameters. The overall fit has a $\chi^2 = 30.9$ 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_{11}	x_{12}	x_{13}	x_{27}	x_{28}	x_{38}	x_{39}	x_{50}	x_{59}	x_{66}
x_{12}	22									
x_{13}	5	9								
x_{27}	15	27	33							
x_{28}	22	71	9	27						
x_{38}	36	60	13	41	60					
x_{39}	35	62	14	43	62	96				
x_{50}	8	13	3	9	14	21	22			
x_{59}	10	18	4	12	18	28	29	17		
x_{66}	19	33	7	23	33	51	53	12	15	
x_{70}	12	22	5	15	22	34	35	8	10	66
x_{86}	5	9	2	6	9	14	15	31	37	8
x_{91}	3	5	1	4	5	8	8	29	13	4
x_{98}	11	19	4	13	19	29	30	7	9	48
x_{115}	17	29	7	20	29	45	47	10	14	84
x_{123}	27	46	10	32	47	75	75	16	22	40
x_{176}	−41	−61	−35	−49	−58	−69	−72	−53	−53	−40

	x_{70}	x_{86}	x_{91}	x_{98}	x_{115}	x_{123}
x_{86}	5					
x_{91}	3	12				
x_{98}	31	5	3			
x_{115}	55	7	4	40		
x_{123}	26	11	6	23	35	
x_{176}	−27	−52	−37	−24	−36	−54

D^+ BRANCHING RATIOS

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

c-quark decays

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

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

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.088±0.005 OUR AVERAGE					
$0.093 \pm 0.009 \pm 0.009$	88	KAYIS-TOPAK...	02	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. • • •					
$0.089 \pm 0.018 \pm 0.025$		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
0.172±0.019 OUR AVERAGE					
$0.20\ ^{+0.09}_{-0.07}$		AGUILAR-...	87E	HYBR	πp, $p p$ 360, 400 GeV
0.170±0.019±0.007	158	BALTRUSAIT...	85B	MRK3	$e^+ e^-$ 3.77 GeV
0.168±0.064	23	SCHINDLER	81	MRK2	$e^+ e^-$ 3.771 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.220^{+0.044}_{-0.022}$		BACINO	80	DLCO	$e^+ e^-$ 3.77 GeV

D^+ and $D^0 \to (e^+ \text{anything}) / (\text{total } D^+ \text{ and } D^0)$

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.110±0.011 OUR AVERAGE		Error includes scale factor of 1.1.			
0.117±0.011	295	BALTRUSAIT...	85B	MRK3	$e^+ e^-$ 3.77 GeV
0.10 ±0.032		[9] SCHINDLER	81	MRK2	$e^+ e^-$ 3.771 GeV
0.072±0.028		FELLER	78	MRK1	$e^+ e^-$ 3.772 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.096±0.004±0.011	2207	[10] ALBRECHT	96C	ARG	$e^+ e^- \approx$ 10 GeV
0.134±0.015±0.010		[11] ABE	93E	VNS	$e^+ e^-$ 58 GeV
$0.098\pm0.009^{+0.006}_{-0.005}$	240	[12] ALBRECHT	92F	ARG	$e^+ e^- \approx$ 10 GeV
0.096±0.007±0.015		[13] ONG	88	MRK2	$e^+ e^-$ 29 GeV
$0.116^{+0.011}_{-0.009}$		[13] PAL	86	DLCO	$e^+ e^-$ 29 GeV
0.091±0.009±0.013		[13] AIHARA	85	TPC	$e^+ e^-$ 29 GeV
0.092±0.022±0.040		[13] ALTHOFF	84J	TASS	$e^+ e^-$ 34.6 GeV
0.091±0.013		[13] KOOP	84	DLCO	See PAL 86
0.08 ±0.015		[14] BACINO	79	DLCO	$e^+ e^-$ 3.772 GeV

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.275±0.024 OUR AVERAGE					
$0.278^{+0.036}_{-0.031}$		[15] BARLAG	92C	ACCM	π^- Cu 230 GeV
0.271±0.023±0.024		COFFMAN	91	MRK3	e^+e^- 3.77 GeV
• • • 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

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.612±0.065±0.043		COFFMAN	91	MRK3	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.52 ±0.18	15	SCHINDLER	81	MRK2	e^+e^- 3.771 GeV
0.39 ±0.29	3	VUILLEMIN	78	MRK1	e^+e^- 3.772 GeV

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.055±0.013±0.009		COFFMAN	91	MRK3	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.08^{+0.06}_{-0.05}$		AGUILAR-...	87E	HYBR	πp, pp 360, 400 GeV
0.06 ±0.04	12	SCHINDLER	81	MRK2	e^+e^- 3.771 GeV
0.06 ±0.06	2	VUILLEMIN	78	MRK1	e^+e^- 3.772 GeV

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

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

VALUE	DOCUMENT ID		TECN	COMMENT
<0.13	PARTRIDGE	81	CBAL	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.02	[16] BRANDELIK	79	DASP	e^+e^- 4.03 GeV

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

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

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

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

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

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

Leptonic and semileptonic modes

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

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

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
3.8± 1.5 OUR AVERAGE						
$3.5\pm 1.4\pm0.6$		7	[18] BONVICINI	04A	CLEO	e^+e^-, $\Psi(3770)$
$8\ {}^{+16}_{-\ 5}\ {}^{+5}_{-2}$		1	[19] BAI	98B	BES	$e^+e^- \to D^{*+}D^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<\ 7.2$	90		ADLER	88B	MRK3	e^+e^- 3.77 GeV
<200	90	0	[20] AUBERT	83	SPEC	μ^+Fe, 250 GeV

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

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

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

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

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

VALUE	DOCUMENT ID		COMMENT
0.082±0.011 OUR AVERAGE Error includes scale factor of 1.8.			
0.072 ± 0.008	PDG	05	Our $\Gamma(\overline{K}^0 e^+\nu_e)/\Gamma_{total}$
0.094 ± 0.009	PDG	05	$1.03\times$ our $\Gamma(\overline{K}^0\mu^+\nu_\mu)/\Gamma_{total}$

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.072 ±0.008 OUR FIT					
0.078 $^{+0.015}_{-0.012}$ OUR AVERAGE Error includes scale factor of 1.1.					
$0.0895\pm0.0159\pm0.0067$	34 ± 6	[21] ABLIKIM	05A	BES	$e^+e^- \to \psi(3770)$
$0.06\ {}^{+0.022}_{-0.013}\pm0.007$	13	BAI	91	MRK3	$e^+e^- \approx$ 3.77 GeV

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
2.53±0.28 OUR FIT					
2.60±0.35±0.26	186	[22] BEAN	93C	CLE2	$e^+e^- \approx \Upsilon(4S)$

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

$\Gamma(\overline{K}^0 e^+ \nu_e)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{11}/Γ_{39}

VALUE	DOCUMENT ID		TECN	COMMENT
0.78±0.09 OUR FIT				
0.66±0.09±0.14	ANJOS	91C	E691	γ Be 80–240 GeV

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.091±0.009 OUR FIT	Error includes scale factor of 1.1.				
$0.07\ ^{+0.028}_{-0.016}\pm0.012$	14	BAI	91	MRK3	$e^+e^- \approx$ 3.77 GeV

$\Gamma(\overline{K}^0 \mu^+ \nu_\mu)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{12}/Γ_{39}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.98 ±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

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

VALUE	EVTS	DOCUMENT ID		COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.76±0.06	84	[23] AOKI	88	π^- emulsion

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

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$0.045^{+0.010}_{-0.008}$ OUR FIT	Error includes scale factor of 1.2.					
$0.035^{+0.012}_{-0.007}\pm0.004$		14	[24] BAI	91	MRK3	$e^+e^- \approx$ 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.057	90		[25] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV

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

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

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

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

VALUE	DOCUMENT ID		COMMENT
0.056±0.004 OUR AVERAGE			
0.055±0.007	PDG	05	Our $\Gamma(\overline{K}^{*0} e^+ \nu_e)/\Gamma_{total}$
0.056±0.005	PDG	05	1.05 × our $\Gamma(\overline{K}^{*0} \mu^+ \nu_\mu)/\Gamma_{total}$

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

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.

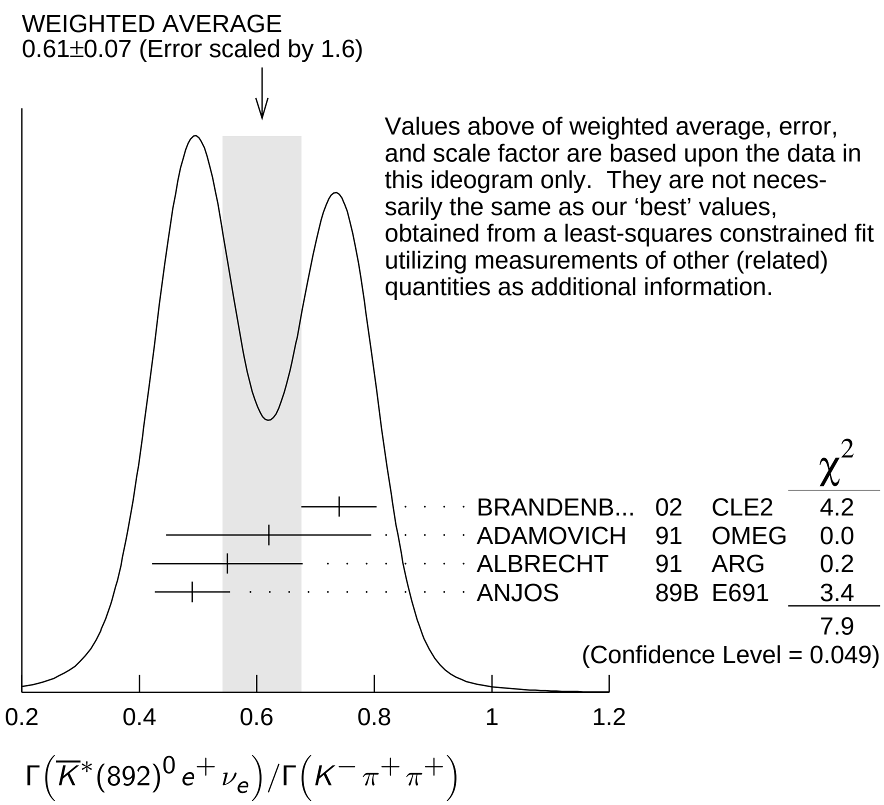
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
$1.23^{+0.24}_{-0.27}$ OUR FIT		Error includes scale factor of 1.2.		
1.0 ±0.3	35	ADAMOVICH 91	OMEG	π^- 340 GeV

$\Gamma(\overline{K}^*(892)^0 e^+ \nu_e)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{27}/Γ_{39}

Unseen decay modes of the $\overline{K}^*(892)^0$ are included. 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
0.60±0.07 OUR FIT		Error includes scale factor of 1.8.		
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	[26] BEAN 93C	CLE2	See BRANDENBURG 02

[26] 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$)/\Gamma_{total}$ — Γ_{15}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.007	90	[27] ANJOS 89B	E691	Photoproduction

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

$\Gamma(K^-\pi^+\mu^+\nu_\mu)/\Gamma(\overline{K}^0\mu^+\nu_\mu)$ — Γ_{16}/Γ_{12}

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

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

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

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

$\Gamma(\overline{K}^*(892)^0\mu^+\nu_\mu)/\Gamma(\overline{K}^0\mu^+\nu_\mu)$ — Γ_{28}/Γ_{12}

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

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.59 ±0.05 OUR FIT				
0.594±0.043±0.033	555 ± 39	LINK 04E	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma(\overline{K}^*(892)^0\mu^+\nu_\mu)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{28}/Γ_{39}

Unseen decay modes of the $\overline{K}^*(892)^0$ are included. 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 ±0.05 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	[29] 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	[30] LINK 02J	FOCS	γ nucleus, $\approx$ 180 GeV

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

[30] 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.

$\Gamma(K^-\pi^+\mu^+\nu_\mu$ nonresonant$)/\Gamma(K^-\pi^+\mu^+\nu_\mu)$ — Γ_{18}/Γ_{16}

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.083±0.029	FRABETTI 93E	E687	< 0.12 (90% CL)

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.022^{+0.047}_{-0.006}\pm0.004$	1	[31] AGUILAR-...	87F	HYBR	πp, $p p$ 360, 400 GeV

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.044^{+0.052}_{-0.013}\pm0.007$	2	[32] AGUILAR-...	87F	HYBR	πp, $p p$ 360, 400 GeV

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

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

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

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

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

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

$\Gamma(K^- \pi^+ \pi^0 \mu^+ \nu_\mu)/\Gamma(K^- \pi^+ \mu^+ \nu_\mu)$ — Γ_{23}/Γ_{16}

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

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

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

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

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

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

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.046±0.014±0.017	100	[33] 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	[34] ALAM	93	CLE2	See BARTELT 97

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

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

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.057	90	[35] AGUILAR-...	87F	HYBR	πp, $p p$ 360, 400 GeV

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

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

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.045±0.014±0.009	49	[36] AITALA	97	E791	π^- nucleus, 500 GeV

[36] 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_{33}/Γ_{28}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.061±0.014 OUR AVERAGE					
0.051±0.015±0.009	54	[37] AITALA	97	E791	π^- nucleus, 500 GeV
0.079±0.019±0.013	39	[38] 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	[39] KODAMA	93C	E653	π^- emulsion 600 GeV

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

[38] 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.

[39] 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.

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

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

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

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

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

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

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

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

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

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

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

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

$\Gamma(\overline{K}^0\pi^+)/\Gamma_{total}$ — Γ_{38}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0283±0.0018 OUR FIT Error includes scale factor of 1.1.					
0.032 ±0.004 OUR AVERAGE					
0.032 ±0.005 ±0.002	161	ADLER	88C	MRK3	e^+e^- 3.77 GeV
0.033 ±0.009	36	[40] SCHINDLER	81	MRK2	e^+e^- 3.771 GeV
0.033 ±0.013	17	[41] PERUZZI	77	MRK1	e^+e^- 3.77 GeV

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

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

$\Gamma(\overline{K}^0\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{38}/Γ_{39}

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

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.307 ±0.005 OUR FIT					
0.307 ±0.005 OUR AVERAGE					
0.3060±0.0046±0.0032	10.6k	LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV
0.348 ±0.024 ±0.022	473	[42] BISHAI	97	CLE2	$e^+e^- \approx \Upsilon(4S)$
0.274 ±0.030 ±0.031	264	ANJOS	90C	E691	Photoproduction

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.092±0.006 OUR FIT Error includes scale factor of 1.1.					
0.091±0.007 OUR AVERAGE					
0.093±0.006±0.008	1502	[43] BALEST	94	CLE2	$e^+e^- \approx \Upsilon(4S)$
0.091±0.013±0.004	1164	ADLER	88C	MRK3	e^+e^- 3.77 GeV
0.091±0.019	239	[44] SCHINDLER	81	MRK2	e^+e^- 3.771 GeV
0.086±0.020	85	[45] PERUZZI	77	MRK1	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.064^{+0.015}_{-0.014}$		[46] BARLAG	92C	ACCM	π^- Cu 230 GeV
$0.063^{+0.028}_{-0.014}\pm0.011$	8	[46] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV

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

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

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

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

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$\Gamma\big(\overline{K}{}^*_0(800)^0\pi^+, \overline{K}{}^*_0(800) \to K^-\pi^+\big)/\Gamma\big(K^-\pi^+\pi^+\big)$ Γ_{40}/Γ_{39}

This is the "fit fraction" from the Dalitz-plot analysis. 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. For now, we exclude AITALA 02 from the average.

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.478±0.121±0.053	AITALA	02	E791	π^- nucleus, 500 GeV

$\Gamma\big(\overline{K}{}^*(892)^0\pi^+, \overline{K}{}^*(892)^0 \to K^-\pi^+\big)/\Gamma\big(K^-\pi^+\pi^+\big)$ Γ_{41}/Γ_{39}

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

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.140±0.010 OUR AVERAGE				
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
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.123±0.010±0.009	[47] AITALA	02	E791	π^- nucleus, 500 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. For now, we exclude AITALA 02 from the average.

$\Gamma\big(\overline{K}{}^*_0(1430)^0\pi^+, \overline{K}{}^*_0(1430)^0 \to K^-\pi^+\big)/\Gamma\big(K^-\pi^+\pi^+\big)$ Γ_{42}/Γ_{39}

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

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.253±0.024 OUR AVERAGE				
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
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.125±0.014±0.005	[48] AITALA	02	E791	π^- nucleus, 500 GeV

[48] 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. For now, we exclude AITALA 02 from the average.

$\Gamma(\overline{K}_2^*(1430)^0\pi^+, \overline{K}_2^*(1430)^0 \to K^-\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{43}/Γ_{39}

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. • • •				
$0.005\pm0.001\pm0.002$	[49] AITALA	02	E791	π^- nucleus, 500 GeV

[49] 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. For now, we exclude AITALA 02 from the average.

$\Gamma(\overline{K}^*(1680)^0\pi^+, \overline{K}^*(1680)^0 \to K^-\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{44}/Γ_{39}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.042 ± 0.008 OUR AVERAGE				
$0.047\pm0.006\pm0.007$	FRABETTI	94G	E687	γ Be, $\overline{E}_\gamma \approx 220$ GeV
$0.030\pm0.004\pm0.013$	ANJOS	93	E691	γ Be 90–260 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.025\pm0.007\pm0.003$	[50] AITALA	02	E791	π^- nucleus, 500 GeV

[50] 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. For now, we exclude AITALA 02 from the average.

$\Gamma(K^-\pi^+\pi^+ \text{ nonresonant})/\Gamma(K^-\pi^+\pi^+)$ — Γ_{45}/Γ_{39}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.95 ± 0.07 OUR AVERAGE				
$0.998\pm0.037\pm0.072$	FRABETTI	94G	E687	γ Be, $\overline{E}_\gamma \approx 220$ GeV
$0.838\pm0.088\pm0.275$	ANJOS	93	E691	γ Be 90–260 GeV
$0.79\pm0.07\pm0.15$	ADLER	87	MRK3	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.130\pm0.058\pm0.044$	[51] AITALA	02	E791	π^- nucleus, 500 GeV

[51] 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. For now, we exclude AITALA 02 from the average.

$\Gamma(\overline{K}^0\pi^+\pi^0)/\Gamma_{total}$ — Γ_{46}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.107 ± 0.029 OUR AVERAGE					
$0.102\pm0.025\pm0.016$	159	ADLER	88C	MRK3	e^+e^- 3.77 GeV
0.19 ± 0.12	10	[52] SCHINDLER	81	MRK2	e^+e^- 3.771 GeV

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

$\Gamma(\overline{K}^0\rho^+)/\Gamma(\overline{K}^0\pi^+\pi^0)$ — Γ_{47}/Γ_{46}

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

VALUE	DOCUMENT ID		TECN	COMMENT
$0.68\pm0.08\pm0.12$	ADLER	87	MRK3	e^+e^- 3.77 GeV

$\Gamma\big(\overline{K}^*(892)^0\pi^+, \overline{K}^*(892)^0 \to \overline{K}^0\pi^0\big)/\Gamma\big(\overline{K}^0\pi^+\pi^0\big)$ — Γ_{48}/Γ_{46}

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

$\Gamma\big(\overline{K}^0\pi^+\pi^0$ nonresonant$\big)/\Gamma\big(\overline{K}^0\pi^+\pi^0\big)$ — Γ_{49}/Γ_{46}

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

$\Gamma\big(K^-\pi^+\pi^+\pi^0\big)/\Gamma_{total}$ — Γ_{50}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.065±0.011 OUR FIT					
0.058±0.012±0.012	142	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.034^{+0.056}_{-0.070}$		[53] BARLAG	92C	ACCM	π^- Cu 230 GeV
$0.022^{+0.047}_{-0.006}\pm0.004$	1	[53] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV
$0.063^{+0.014}_{-0.013}\pm0.012$	175	BALTRUSAIT...	86E	MRK3	See COFFMAN 92B

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

$\Gamma\big(K^-\pi^+\pi^+\pi^0\big)/\Gamma\big(K^-\pi^+\pi^+\big)$ — Γ_{50}/Γ_{39}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.70±0.12 OUR FIT					
0.76±0.11±0.12	91	ANJOS	92C	E691	γBe 90–260 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.69±0.10±0.16		ANJOS	89E	E691	See ANJOS 92C
$0.57^{+0.65}_{-0.17}$	1	AGUILAR-...	83B	HYBR	$\pi^- p$, 360 GeV

$\Gamma\big(\overline{K}^*(892)^0\rho^+$ total$\big)/\Gamma\big(K^-\pi^+\pi^+\pi^0\big)$ — Γ_{80}/Γ_{50}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.33±0.165±0.12	[54] ANJOS	92C	E691	γBe 90–260 GeV

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

$\Gamma\big(\overline{K}^*(892)^0\rho^+$ S-wave$\big)/\Gamma\big(K^-\pi^+\pi^+\pi^0\big)$ — Γ_{81}/Γ_{50}

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	γBe 90–260 GeV
0.833±0.116±0.165	COFFMAN	92B	MRK3	e^+e^- 3.77 GeV

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

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

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

$\Gamma\big(\overline{K}^*(892)^0 \rho^+ \text{ D-wave}\big)/\Gamma\big(K^- \pi^+ \pi^+ \pi^0\big)$ — Γ_{83}/Γ_{50}

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

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

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

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

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

$\Gamma\big(\overline{K}_1(1400)^0 \pi^+\big)/\Gamma\big(K^- \pi^+ \pi^+ \pi^0\big)$ — Γ_{86}/Γ_{50}

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

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

$\Gamma\big(K^- \rho^+ \pi^+ \text{ total}\big)/\Gamma\big(K^- \pi^+ \pi^+ \pi^0\big)$ — Γ_{92}/Γ_{50}

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

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

$\Gamma\big(K^- \rho^+ \pi^+ \text{ 3-body}\big)/\Gamma\big(K^- \pi^+ \pi^+ \pi^0\big)$ — Γ_{93}/Γ_{50}

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

$\Gamma\big(\overline{K}^*(892)^0 \pi^+ \pi^0 \text{ total}\big)/\Gamma\big(K^- \pi^+ \pi^+ \pi^0\big)$ — Γ_{88}/Γ_{50}

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

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

$\Gamma\big(\overline{K}^*(892)^0 \pi^+ \pi^0 \text{ 3-body}\big)/\Gamma_{\text{total}}$ — Γ_{89}/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	[55] COFFMAN	92B	MRK3	$e^+ e^-$ 3.77 GeV

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

$\Gamma(\overline{K}^*(892)^0 \pi^+ \pi^0 \text{ 3-body})/\Gamma(K^- \pi^+ \pi^+ \pi^0)$ — Γ_{89}/Γ_{50}

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

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

$\Gamma(K^*(892)^- \pi^+ \pi^+ \text{ 3-body})/\Gamma(K^- \pi^+ \pi^+ \pi^0)$ — Γ_{91}/Γ_{50}

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

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

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.002	90	[56] ANJOS	92C	E691	γ Be 90–260 GeV

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

$\Gamma(K^- \pi^+ \pi^+ \pi^0 \text{ nonresonant})/\Gamma(K^- \pi^+ \pi^+ \pi^0)$ — Γ_{58}/Γ_{50}

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

$\Gamma(\overline{K}^0 \pi^+ \pi^+ \pi^-)/\Gamma_{total}$ — Γ_{59}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.071±0.010 OUR FIT					
0.071±0.016 OUR AVERAGE					
0.066±0.015±0.005	168	ADLER	88C	MRK3	$e^+ e^-$ 3.77 GeV
0.12 ±0.05	21	[57] SCHINDLER	81	MRK2	$e^+ e^-$ 3.771 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.042^{+0.019}_{-0.017}$		[58] BARLAG	92C	ACCM	π^- Cu 230 GeV
$0.243^{+0.064}_{-0.041}\pm0.041$	11	[58] AGUILAR-...	87F	HYBR	πp, $p p$ 360, 400 GeV

[57] 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.

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

$\Gamma(\overline{K}^0 \pi^+ \pi^+ \pi^-)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{59}/Γ_{39}

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

$\Gamma(\overline{K}^0 a_1(1260)^+)/\Gamma(\overline{K}^0 \pi^+ \pi^+ \pi^-)$ — Γ_{78}/Γ_{59}

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

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

$\Gamma(\overline{K}^0 a_2(1320)^+)/\Gamma_{total}$ — Γ_{79}/Γ

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

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

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

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

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

$\Gamma(\overline{K}_1(1400)^0 \pi^+)/\Gamma_{total}$ — Γ_{86}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.009	90	[59] ANJOS	92C	E691	γ Be 90–260 GeV

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

$\Gamma(\overline{K}_1(1400)^0 \pi^+)/\Gamma(\overline{K}^0 \pi^+ \pi^+ \pi^-)$ — Γ_{86}/Γ_{59}

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

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

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

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

$\Gamma(K^*(892)^- \pi^+ \pi^+ \text{total})/\Gamma(\overline{K}^0 \pi^+ \pi^+ \pi^-)$ — Γ_{90}/Γ_{59}

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

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

$\Gamma(K^*(892)^- \pi^+ \pi^+ \text{3-body})/\Gamma_{total}$ — Γ_{91}/Γ

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

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

$\Gamma(K^*(892)^- \pi^+ \pi^+ \text{3-body})/\Gamma(\overline{K}^0 \pi^+ \pi^+ \pi^-)$ — Γ_{91}/Γ_{59}

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

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

$\Gamma(\overline{K}^0 \rho^0 \pi^+ \text{total})/\Gamma(\overline{K}^0 \pi^+ \pi^+ \pi^-)$ — Γ_{94}/Γ_{59}

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

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

$\Gamma(\overline{K}^0 \rho^0 \pi^+ \text{3-body})/\Gamma_{\text{total}}$ — Γ_{95}/Γ

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

$\Gamma(\overline{K}^0 \rho^0 \pi^+ \text{3-body})/\Gamma(\overline{K}^0 \pi^+ \pi^+ \pi^-)$ — Γ_{95}/Γ_{59}

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

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.005	90	ANJOS	92C	E691	γ Be 90–260 GeV

$\Gamma(\overline{K}^0 \pi^+ \pi^+ \pi^- \text{ nonresonant})/\Gamma(\overline{K}^0 \pi^+ \pi^+ \pi^-)$ — Γ_{65}/Γ_{59}

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

$\Gamma(K^- 3\pi^+ \pi^-)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{66}/Γ_{39}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.064±0.006 OUR FIT Error includes scale factor of 1.2.					
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

$\Gamma(\overline{K}^*(892)^0 \pi^+ \pi^+ \pi^-)/\Gamma(K^- 3\pi^+ \pi^-)$ — Γ_{97}/Γ_{66}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.32±0.06±0.09	LINK	03D	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.25±0.12±0.23	ANJOS	90D	E691	Photoproduction

$\Gamma(\overline{K}^*(892)^0 \rho^0 \pi^+)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{98}/Γ_{39}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.035±0.007 OUR FIT Error includes scale factor of 1.1.				
0.023±0.010±0.006	FRABETTI	97C	E687	γBe, $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma(\overline{K}^*(892)^0 \rho^0 \pi^+)/\Gamma(K^- 3\pi^+ \pi^-)$ — Γ_{98}/Γ_{66}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.54±0.10 OUR FIT Error includes scale factor of 1.1.				
0.60±0.05±0.09	LINK	03D	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma(\overline{K}^*(892)^0 \rho^0 \pi^+)/\Gamma(\overline{K}^*(892)^0 \pi^+ \pi^+ \pi^-)$ — Γ_{98}/Γ_{97}

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.75±0.17±0.19	ANJOS	90D	E691	Photoproduction

$\Gamma(\overline{K}^*(892)^0 \pi^+ \pi^+ \pi^-\ \text{no-}\rho)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{99}/Γ_{39}

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

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

$\Gamma(K^- \rho^0 \pi^+ \pi^+)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{70}/Γ_{39}

VALUE	DOCUMENT ID		TECN	COMMENT
0.0200±0.0032 OUR FIT Error includes scale factor of 1.1.				
0.034 ±0.009 ±0.005	FRABETTI	97C	E687	γBe, $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma(K^- \rho^0 \pi^+ \pi^+)/\Gamma(K^- 3\pi^+ \pi^-)$ — Γ_{70}/Γ_{66}

VALUE	DOCUMENT ID		TECN	COMMENT
0.31±0.04 OUR FIT				
0.30±0.04±0.01	LINK	03D	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma(\overline{K}^*(892)^0 a_1(1260)^+)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{101}/Γ_{39}

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

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

$\Gamma(K^- 3\pi^+ \pi^-\ \text{nonresonant})/\Gamma(K^- 3\pi^+ \pi^-)$ — Γ_{71}/Γ_{66}

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
0.07 ±0.05±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	γBe, $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma(K^- 2\pi^+ 2\pi^0)/\Gamma_{total}$ — Γ_{72}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.015		[60] BARLAG	92C	ACCM	π^- Cu 230 GeV
$0.022^{+0.047}_{-0.008}\pm0.004$	1	[60] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV

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

$\Gamma(\overline{K}^0 2\pi^+ \pi^- \pi^0)/\Gamma_{total}$ — Γ_{73}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.099^{+0.036}_{-0.070}$		[61] BARLAG	92C	ACCM	π^- Cu 230 GeV
$0.044^{+0.052}_{-0.013}\pm0.007$	2	[61] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV

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

$\Gamma(\overline{K}^0 3\pi^+ 2\pi^-)/\Gamma_{total}$ — Γ_{74}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.0008 ± 0.0007	[62] BARLAG	92C	ACCM	π^- Cu 230 GeV

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

$\Gamma(K^- 3\pi^+ \pi^- \pi^0)/\Gamma_{total}$ — Γ_{75}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.0020 ± 0.0018	[63] BARLAG	92C	ACCM	π^- Cu 230 GeV

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

$\Gamma(\overline{K}^0 \overline{K}^0 K^+)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{76}/Γ_{39}

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

$\Gamma(K^+ K^- \overline{K}^0 \pi^+)/\Gamma(\overline{K}^0 \pi^+ \pi^+ \pi^-)$ — Γ_{77}/Γ_{59}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0077±0.0015±0.0009	35	LINK	01C	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV

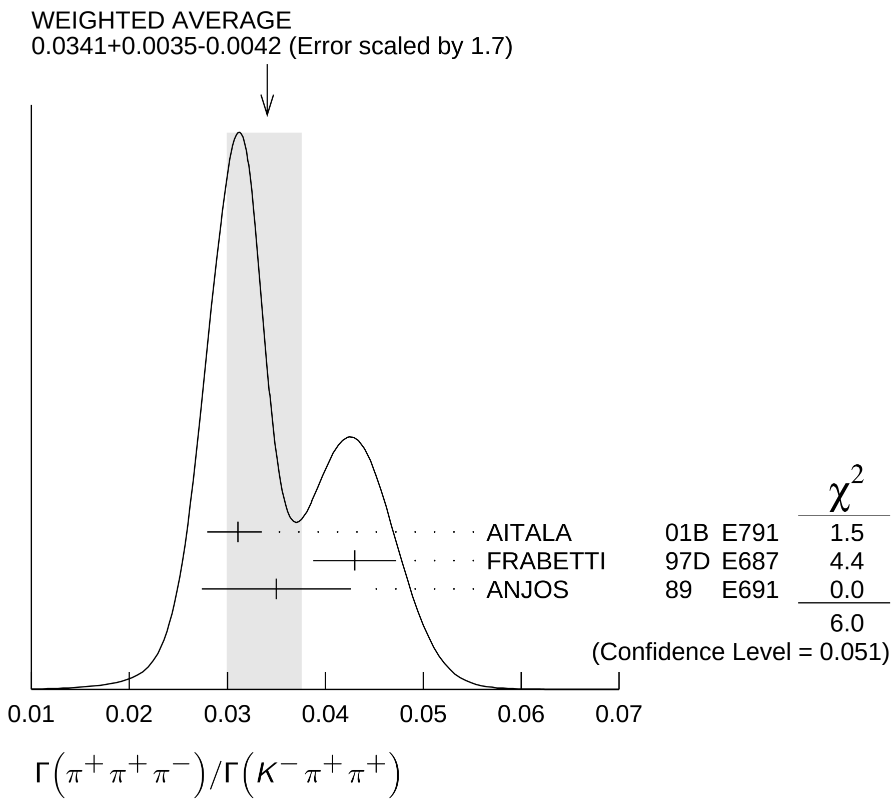
Pionic modes

$\Gamma(\pi^+ \pi^0)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{102}/Γ_{39}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0144±0.0019±0.0010	171 ± 22	ARMS	04	CLEO	$e^+e^- \approx 10$ GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.028\pm0.006\pm0.005$	34	SELEN	93	CLE2	See ARMS 04

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$0.0341^{+0.0035}_{-0.0042}$ OUR AVERAGE Error includes scale factor of 1.7. See the ideogram below.					
$0.0311\pm0.0018^{+0.0016}_{-0.0026}$	1172	AITALA	01B	E791	π^- nucleus, 500 GeV
$0.043\pm0.003\pm0.003$	236	FRABETTI	97D	E687	γ Be $\approx$ 200 GeV
$0.035\pm0.007\pm0.003$	83	ANJOS	89	E691	Photoproduction
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.032\pm0.011\pm0.003$	20	ADAMOVICH	93	WA82	π^- 340 GeV
$0.042\pm0.016\pm0.010$	57	BALTRUSAIT...	85E	MRK3	e^+e^- 3.77 GeV



$\Gamma(\pi^+(\pi^+\pi^-)_{S-\text{wave}})/\Gamma(\pi^+\pi^+\pi^-)$ — $\Gamma_{104}/\Gamma_{103}$

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

VALUE	DOCUMENT ID		TECN	COMMENT
$0.5600\pm0.0324\pm0.0214$	[64] LINK	04	FOCS	Dalitz fit, 1527 ± 51 evts

[64] 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.

$\Gamma(\sigma\pi^+, \sigma\to\pi^+\pi^-)/\Gamma(\pi^+\pi^+\pi^-)$ — $\Gamma_{105}/\Gamma_{103}$

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. • • •				
$0.463\pm0.090\pm0.021$	AITALA	01B	E791	Dalitz fit, 1172 evts

$\Gamma(f_0(980)\pi^+, f_0(980)\to\pi^+\pi^-)/\Gamma(\pi^+\pi^+\pi^-)$ — $\Gamma_{106}/\Gamma_{103}$

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. • • •				
$0.062\pm0.013\pm0.004$	AITALA	01B	E791	Dalitz fit, 1172 evts

$\Gamma(f_0(1370)\pi^+, f_0(1370)\to\pi^+\pi^-)/\Gamma(\pi^+\pi^+\pi^-)$ — $\Gamma_{107}/\Gamma_{103}$

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. • • •				
$0.023\pm0.015\pm0.008$	AITALA	01B	E791	Dalitz fit, 1172 evts

$\Gamma(\rho^0\pi^+)/\Gamma(\pi^+\pi^+\pi^-)$ — $\Gamma_{108}/\Gamma_{103}$

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

VALUE	DOCUMENT ID		TECN	COMMENT
$0.3082\pm0.0314\pm0.0230$	LINK	04	FOCS	Dalitz fit, 1527 ± 51 evts
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.336\pm0.032\pm0.022$	AITALA	01B	E791	Dalitz fit, 1172 evts
$0.289\pm0.055\pm0.058$	[65] FRABETTI	97D	E687	γ Be $\approx$ 200 GeV

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

$\Gamma(\rho^0\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{108}/Γ_{39}

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

$\Gamma(f_2(1270)\pi^+, f_2(1270)\to\pi^+\pi^-)/\Gamma(\pi^+\pi^+\pi^-)$ — $\Gamma_{109}/\Gamma_{103}$

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

VALUE	DOCUMENT ID		TECN	COMMENT
$0.1174\pm0.0190\pm0.0029$	LINK	04	FOCS	Dalitz fit, 1527 ± 51 evts
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.194\pm0.025\pm0.004$	AITALA	01B	E791	Dalitz fit, 1172 evts

$\Gamma(\rho(1450)^0\pi^+, \rho(1450)^0\to\pi^+\pi^-)/\Gamma(\pi^+\pi^+\pi^-)$ — $\Gamma_{110}/\Gamma_{103}$

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. • • •				
$0.007\pm0.007\pm0.003$	AITALA	01B	E791	Dalitz fit, 1172 evts

$\Gamma(\pi^+\pi^+\pi^-$ nonresonant$)/\Gamma(\pi^+\pi^+\pi^-)$ — $\Gamma_{111}/\Gamma_{103}$

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.

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.078\pm0.060\pm0.027$	AITALA	01B	E791	Dalitz fit, 1172 evts
$0.589\pm0.105\pm0.081$	[66] FRABETTI	97D	E687	γ Be $\approx$ 200 GeV

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

$\Gamma(\pi^+\pi^+\pi^-$ nonresonant$)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{111}/Γ_{39}

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.027\pm0.007\pm0.002$	ANJOS	89	E691	Photoproduction

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

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.019^{+0.015}_{-0.012}$	[67] BARLAG	92C	ACCM	π^- Cu 230 GeV

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

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

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

$\Gamma(\eta\pi^+)/\Gamma(\phi\pi^+)$ — $\Gamma_{117}/\Gamma_{141}$

Unseen decay modes of the η are included.

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

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

Unseen decay modes of the η are included.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$0.083\pm0.023\pm0.014$		99	DAOUDI	92	CLE2	See JESSOP 98
<0.12	90		ANJOS	89E	E691	Photoproduction

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

Unseen decay modes of the ω are included.

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

$\Gamma(3\pi^+2\pi^-)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{115}/Γ_{39}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0188±0.0022 OUR FIT	Error includes scale factor of 1.2.				
0.023 ±0.004 ±0.002	58	FRABETTI	97C	E687	γBe, $\overline{E}_\gamma \approx$ 200 GeV

$\Gamma(3\pi^+2\pi^-)/\Gamma(K^-3\pi^+\pi^-)$ — Γ_{115}/Γ_{66}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.295±0.022 OUR FIT	Error includes scale factor of 1.1.				
0.290±0.017±0.011	835	LINK	03D	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV

$\Gamma(\eta\rho^+)/\Gamma(\phi\pi^+)$ — $\Gamma_{120}/\Gamma_{141}$

Unseen decay modes of the η are included.

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

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

Unseen decay modes of the η are included.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.13	90	DAOUDI	92	CLE2	See JESSOP 98

$\Gamma(3\pi^+2\pi^-\pi^0)/\Gamma_{total}$ — Γ_{116}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.0029^{+0.0029}_{-0.0020}$	[68] BARLAG	92C	ACCM	π^- Cu 230 GeV

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

$\Gamma(\eta'(958)\pi^+)/\Gamma(\phi\pi^+)$ — $\Gamma_{121}/\Gamma_{141}$

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

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

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

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.1	90	DAOUDI	92	CLE2	See JESSOP 98
<0.1	90	ALVAREZ	91	NA14	Photoproduction
<0.13	90	ANJOS	91B	E691	γBe, $\overline{E}_\gamma \approx$ 145 GeV

$\Gamma(\eta'(958)\rho^+)/\Gamma(\phi\pi^+)$ — $\Gamma_{122}/\Gamma_{141}$

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

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

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

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.17	90	DAOUDI	92	CLE2	See JESSOP 98

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

$\Gamma(K^+\overline{K}^0)/\Gamma(\overline{K}^0\pi^+)$ — Γ_{123}/Γ_{38}

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

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.200 ±0.011 OUR FIT					
0.204 ±0.018 OUR AVERAGE Error includes scale factor of 1.1.					
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	γBe $\overline{E}_\gamma \approx$ 200 GeV
0.271 ±0.065 ±0.039	69	ANJOS	90C	E691	γBe
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	[69] LINK	02B	FOCS	γ A, $\overline{E}_\gamma \approx$ 180 GeV
0.222 ±0.041 ±0.029	70	[70] BISHAI	97	CLE2	See ARMS 04

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

$\Gamma(K^+\overline{K}^0)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{123}/Γ_{39}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0614±0.0034 OUR FIT					
0.0604±0.0035±0.0030	949	LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.077 ±0.014 ±0.007	70	[71] BISHAI	97	CLE2	See ARMS 04

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

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.097 ±0.006 OUR AVERAGE				
0.093 ±0.010 $^{+0.008}_{-0.006}$	JUN	00	SELX	Σ^- nucleus, 600 GeV
0.0976±0.0042±0.0046	FRABETTI	95B	E687	γ Be, $\overline{E}_\gamma \approx$ 200 GeV

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

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

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

$\Gamma(\phi\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{141}/Γ_{39}

Unseen decay modes of the ϕ are included. However, we now get branching fractions for resonant submodes of 3-body decays from Dalitz-plot analyses.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.062\pm0.017\pm0.006$	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

$\Gamma(K^+\overline{K}^*(892)^0, \overline{K}^*(892)^0 \to K^-\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{126}/Γ_{39}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.301±0.020±0.025	FRABETTI	95B	E687	Dalitz fit, 915 evts

$\Gamma(K^+\overline{K}^*_0(1430)^0, \overline{K}^*_0(1430)^0 \to K^-\pi^+)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{127}/Γ_{39}

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.370±0.035±0.018	FRABETTI	95B	E687	Dalitz fit, 915 evts

$\Gamma(K^+\overline{K}^*(892)^0)/\Gamma(K^-\pi^+\pi^+)$ — Γ_{145}/Γ_{39}

Unseen decay modes of the $\overline{K}^*(892)^0$ are included. However, we now get branching fractions for resonant submodes of 3-body 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_{128}/Γ_{39}

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

$\Gamma(K^*(892)^+\overline{K}^0)/\Gamma(\overline{K}^0\pi^+)$ — Γ_{146}/Γ_{38}

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

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

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

Unseen decay modes of the ϕ are included.

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

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

$\Gamma(\phi\pi^+\pi^0)/\Gamma(K^-\pi^+\pi^+)$ **Γ_{142}/Γ_{39}**

Unseen decay modes of the ϕ are included.

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

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

Unseen decay modes of the ϕ are included.

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

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

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

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

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

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

$\Gamma(K^+\overline{K}^0\pi^+\pi^-)/\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)$ **Γ_{135}/Γ_{59}**

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

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

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

$\Gamma(K^0K^-\pi^+\pi^+)/\Gamma(\overline{K}^0\pi^+\pi^+\pi^-)$ **Γ_{136}/Γ_{59}**

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

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

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

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

$\Gamma(K^*(892)^+\overline{K}^*(892)^0)/\Gamma_{\text{total}}$ **Γ_{147}/Γ**

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

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

$\Gamma(K^0 K^- \pi^+ \pi^+ (\text{non-}K^{*+} \overline{K}^{*0}))/\Gamma_{total}$ — Γ_{138}/Γ

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

$\Gamma(K^+ K^- \pi^+ \pi^+ \pi^-)/\Gamma(K^- 3\pi^+ \pi^-)$ — Γ_{139}/Γ_{66}

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

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

Unseen decay modes of the ϕ are included.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.002	90	0	ANJOS	88	E691	Photoproduction

$\Gamma(\phi \pi^+ \pi^+ \pi^-)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{144}/Γ_{39}

Unseen decay modes of the ϕ are included.

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

$\Gamma(\phi \pi^+ \pi^+ \pi^-)/\Gamma(\phi \pi^+)$ — $\Gamma_{144}/\Gamma_{141}$

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

$\Gamma(K^+ K^- \pi^+ \pi^+ \pi^- \text{ nonresonant})/\Gamma_{total}$ — Γ_{140}/Γ

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.03	90	12	ANJOS	88	E691	Photoproduction

Doubly Cabibbo suppressed modes

$\Gamma(K^+ \pi^0)/\Gamma_{total}$ — Γ_{148}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<4.2 \times 10^{-4}$	90	ARMS	04	CLEO	$e^+ e^- \approx$ 10 GeV

$\Gamma(K^+ \pi^+ \pi^-)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{149}/Γ_{39}

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	γ Be, $\overline{E}_\gamma =$ 220 GeV

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

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

$\Gamma\big(K^+ f_0(980),\ f_0(980) \to \pi^+\pi^-\big)/\Gamma\big(K^+\pi^+\pi^-\big)$ — $\Gamma_{152}/\Gamma_{149}$

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

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

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

$\Gamma\big(K_2^*(1430)^0\pi^+,\ K_2^*(1430)^0 \to K^+\pi^-\big)/\Gamma\big(K^+\pi^+\pi^-\big)$ — $\Gamma_{153}/\Gamma_{149}$

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

$\Gamma\big(K^+\pi^+\pi^-$ nonresonant$\big)/\Gamma\big(K^+\pi^+\pi^-\big)$ — $\Gamma_{154}/\Gamma_{149}$

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	[75] AITALA	97C	E791	Dalitz fit, 59 evts

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

$\Gamma\big(K^+K^+K^-\big)/\Gamma\big(K^-\pi^+\pi^+\big)$ — Γ_{155}/Γ_{39}

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

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
9.49± 2.17± 0.22		65	[76] LINK	02I	FOCS	γ nucleus, ≈ 180 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
< 16	90		[77] FRABETTI	95F	E687	γBe, $\overline{E}_\gamma$ ≈ 220 GeV
570 ±200 ±70		13	ADAMOVICH	93	WA82	π^- 340 GeV

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

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

$\Gamma\big(\phi K^+\big)/\Gamma\big(\phi\pi^+\big)$ — $\Gamma_{156}/\Gamma_{141}$

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<0.021	90		FRABETTI	95F	E687	γBe, $\overline{E}_\gamma$ ≈ 220 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$0.058^{+0.032}_{-0.026}\pm0.007$		4	[78] ANJOS	92D	E691	γBe, $\overline{E}_\gamma$ = 145 GeV

[78] 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_{157}/Γ

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$<5.2 \times 10^{-5}$	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
$<6.6 \times 10^{-5}$	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

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

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$<8.8 \times 10^{-6}$	90		LINK	03F	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<1.5 \times 10^{-5}$	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_{159}/Γ

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

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

$\Gamma(K^+ e^+ e^-)/\Gamma_{total}$ — Γ_{160}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<2.0 \times 10^{-4}$	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
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<4.8 \times 10^{-3}$	90	WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$<9.2 \times 10^{-6}$	90		LINK	03F	FOCS	γ nucleus, $\overline{E}_\gamma \approx$ 180 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<4.4 \times 10^{-5}$	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_{162}/Γ

A test of lepton-family-number conservation.

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

$\Gamma(\pi^+ e^+ \mu^-)/\Gamma_{total}$ — Γ_{163}/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_{164}/Γ

A test of lepton-family-number conservation.

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

$\Gamma(K^+ e^\pm \mu^\mp)/\Gamma_{total}$ — Γ_{165}/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_{166}/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_{167}/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_{168}/Γ

A test of lepton-number conservation.

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

$\Gamma(\pi^- \mu^+ \mu^+)/\Gamma_{total}$ — Γ_{169}/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_{170}/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_{171}/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_{172}/Γ

A test of lepton-number conservation.

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

$\Gamma(K^- \mu^+ \mu^+)/\Gamma_{total}$ — Γ_{173}/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_{174}/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_{175}/Γ

A test of lepton-number conservation.

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$<8.5\times10^{-4}$	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
$-0.016\pm0.015\pm0.009$	10.6k	[79] LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma \approx 180$ GeV

[79] 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
$+0.071\pm0.061\pm0.012$	949	[80] LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma \approx 180$ GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$+0.069\pm0.060\pm0.015$	949	[81] LINK	02B	FOCS	γ nucleus, $\overline{E}_\gamma \approx 180$ GeV

[80] 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^-.

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

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.002 ± 0.011 OUR AVERAGE					
$+0.006\pm0.011\pm0.005$	14k	[82] LINK	00B	FOCS	
-0.014 ± 0.029		[82] AITALA	97B	E791	$-0.062 < A_{CP} < +0.034$ (90% CL)
-0.031 ± 0.068		[82] FRABETTI	94I	E687	$-0.14 < A_{CP} < +0.081$ (90% CL)

[82] FRABETTI 94I, AITALA 98C, and LINK 00B measure $N(D^+ \to K^-K^+\pi^+)/N(D^+ \to K^-\pi^+\pi^+)$, the ratio of numbers of events observed, and similarly for the D^-.

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

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

VALUE	DOCUMENT ID		TECN	COMMENT
-0.02 ± 0.05 OUR AVERAGE				
-0.010 ± 0.050	[83] AITALA	97B	E791	$-0.092 < A_{CP} < +0.072$ (90% CL)
-0.12 ± 0.13	[83] FRABETTI	94I	E687	$-0.33 < A_{CP} < +0.094$ (90% CL)

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

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

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

VALUE	DOCUMENT ID		TECN	COMMENT
−0.014±0.033 OUR AVERAGE				
−0.028±0.036	[84] AITALA	97B	E791	$-0.087 < A_{CP} < +0.031$ (90% CL)
+0.066±0.086	[84] FRABETTI	94I	E687	$-0.075 < A_{CP} < +0.21$ (90% CL)

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

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

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

VALUE	DOCUMENT ID		TECN	COMMENT
−0.017±0.042	[85] AITALA	97B	E791	$-0.086 < A_{CP} < +0.052$ (90% CL)

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

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

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

VALUE (nanobarns)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
4.2 ±0.6 ±0.3	[86] ADLER	88C	MRK3	e^+e^- 3.768 GeV
5.5 ±1.0	[87] PARTRIDGE	84	CBAL	e^+e^- 3.771 GeV
6.00±0.72±1.02	[88] SCHINDLER	80	MRK2	e^+e^- 3.771 GeV
9.1 ±2.0	[89] PERUZZI	77	MRK1	e^+e^- 3.774 GeV

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

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

[88] This measurement comes from a scan of the $\psi(3770)$ resonance and a fit to the cross section. SCHINDLER 80 assume the phase space division of neutral and charged D mesons in $\psi(3770)$ decay to be 1.33, and that the $\psi(3770)$ is an isosinglet. The noncharm decays (e.g. radiative) of the $\psi(3770)$ are included in this measurement and may amount to a few percent correction.

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

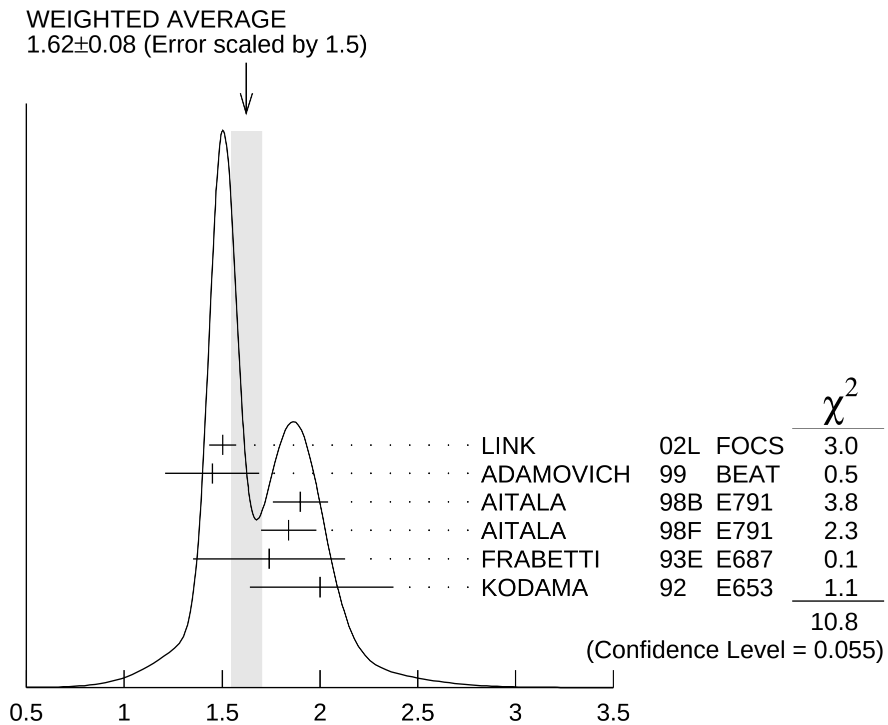
$D^+ \to \overline{K}^*(892)^0 \ell^+ \nu_\ell$ FORM FACTORS

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.62 ±0.08 OUR AVERAGE		Error includes scale factor of 1.5. See the ideogram below.			
1.504±0.057±0.039	15k	[90] 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	[91] 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	$\overline{K}^*(892)^0 e^+ \nu_e$

[90] 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.

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



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

$r_2 \equiv A_2(0)/A_1(0)$ 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	[92] 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	$\overline{K}^*(892)^0 e^+ \nu_e$

[92] 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 $D^+ \to \overline{K}^*(892)^0 \ell^+ \nu_\ell$

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

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

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

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LINK	03D	PL B561 225	J.M. Link et al.	(FNAL FOCUS Collab.)
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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.)
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ADAMOVICH	99	EPJ C6 35	M. Adamovich *et al.*	(CERN BEATRICE Collab.)
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AITALA	98C	PL B421 405	E.M. Aitala *et al.*	(FNAL E791 Collab.)
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ADAMOVICH	93	PL B305 177	M.I. Adamovich *et al.*	(CERN WA82 Collab.)
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KODAMA	92	PL B274 246	K. Kodama *et al.*	(FNAL E653 Collab.)
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ALVAREZ	90	ZPHY C47 539	M.P. Alvarez *et al.*	(CERN NA14/2 Collab.)
ALVAREZ	90C	PL B246 261	M.P. Alvarez *et al.*	(CERN NA14/2 Collab.)
ANJOS	90C	PR D41 2705	J.C. Anjos *et al.*	(FNAL E691 Collab.)
ANJOS	90D	PR D42 2414	J.C. Anjos *et al.*	(FNAL E691 Collab.)
ANJOS	90E	PRL 65 2630	J.C. Anjos *et al.*	(FNAL E691 Collab.)
BARLAG	90C	ZPHY C46 563	S. Barlag *et al.*	(ACCMOR Collab.)
WEIR	90B	PR D41 1384	A.J. Weir *et al.*	(Mark II Collab.)
ANJOS	89	PRL 62 125	J.C. Anjos *et al.*	(FNAL E691 Collab.)
ANJOS	89B	PRL 62 722	J.C. Anjos *et al.*	(FNAL E691 Collab.)
ANJOS	89E	PL B223 267	J.C. Anjos *et al.*	(FNAL E691 Collab.)
ADLER	88B	PRL 60 1375	J. Adler *et al.*	(Mark III Collab.)
ADLER	88C	PRL 60 89	J. Adler *et al.*	(Mark III Collab.)
ALBRECHT	88I	PL B210 267	H. Albrecht *et al.*	(ARGUS Collab.)
ANJOS	88	PRL 60 897	J.C. Anjos *et al.*	(FNAL E691 Collab.)
AOKI	88	PL B209 113	S. Aoki *et al.*	(WA75 Collab.)
HAAS	88	PRL 60 1614	P. Haas *et al.*	(CLEO Collab.)
ONG	88	PRL 60 2587	R.A. Ong *et al.*	(Mark II Collab.)
RAAB	88	PR D37 2391	J.R. Raab *et al.*	(FNAL E691 Collab.)
ADAMOVICH	87	EPL 4 887	M.I. Adamovich *et al.*	(Photon Emulsion Collab.)
ADLER	87	PL B196 107	J. Adler *et al.*	(Mark III Collab.)
AGUILAR-...	87E	ZPHY C36 551	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
Also	88B	ZPHY C40 321	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
AGUILAR-...	87F	ZPHY C36 559	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
Also	88	ZPHY C38 520 erratum	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
BARTEL	87	ZPHY C33 339	W. Bartel *et al.*	(JADE Collab.)
AGUILAR-...	86B	ZPHY C31 491	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
BALTRUSAIT...	86E	PRL 56 2140	R.M. Baltrusaitis *et al.*	(Mark III Collab.)
PAL	86	PR D33 2708	T. Pal *et al.*	(DELCO Collab.)
AIHARA	85	ZPHY C27 39	H. Aihara *et al.*	(TPC Collab.)
BALTRUSAIT...	85B	PRL 54 1976	R.M. Baltrusaitis *et al.*	(Mark III Collab.)
BALTRUSAIT...	85E	PRL 55 150	R.M. Baltrusaitis *et al.*	(Mark III Collab.)
BARTEL	85J	PL 163B 277	W. Bartel *et al.*	(JADE Collab.)
ADAMOVICH	84	PL 140B 119	M.I. Adamovich *et al.*	(CERN WA58 Collab.)
ALTHOFF	84G	ZPHY C22 219	M. Althoff *et al.*	(TASSO Collab.)
ALTHOFF	84J	PL 146B 443	M. Althoff *et al.*	(TASSO Collab.)
DERRICK	84	PRL 53 1971	M. Derrick *et al.*	(HRS Collab.)
KOOP	84	PRL 52 970	D.E. Koop *et al.*	(DELCO Collab.)
PARTRIDGE	84	Thesis CALT-68-1150	R.A. Partridge	(Crystal Ball Collab.)
AGUILAR-...	83B	PL 123B 98	M. Aguilar-Benitez *et al.*	(LEBC-EHS Collab.)
AUBERT	83	NP B213 31	J.J. Aubert *et al.*	(EMC Collab.)
PARTRIDGE	81	PRL 47 760	R. Partridge *et al.*	(Crystal Ball Collab.)
SCHINDLER	81	PR D24 78	R.H. Schindler *et al.*	(Mark II Collab.)
TRILLING	81	PRPL 75 57	G.H. Trilling	(LBL, UCB) J
BACINO	80	PRL 45 329	W.J. Bacino *et al.*	(DELCO Collab.)
SCHINDLER	80	PR D21 2716	R.H. Schindler *et al.*	(Mark II Collab.)
ZHOLENTZ	80	PL 96B 214	A.A. Zholents *et al.*	(NOVO)
Also	81	SJNP 34 814	A.A. Zholents *et al.*	(NOVO)
		Translated from YAF 34 1471.		
BACINO	79	PRL 43 1073	W.J. Bacino *et al.*	(DELCO Collab.)
BRANDELIK	79	PL 80B 412	R. Brandelik *et al.*	(DASP Collab.)
FELLER	78	PRL 40 274	J.M. Feller *et al.*	(Mark I Collab.)
VUILLEMIN	78	PRL 41 1149	V. Vuillemin *et al.*	(Mark I Collab.)
GOLDHABER	77	PL 69B 503	G. Goldhaber *et al.*	(Mark I Collab.)
PERUZZI	77	PRL 39 1301	I. Peruzzi *et al.*	(Mark I Collab.)
PICCOLO	77	PL 70B 260	M. Piccolo *et al.*	(Mark I Collab.)
RAPIDIS	77	PRL 39 526	P.A. Rapidis *et al.*	(Mark I Collab.)
PERUZZI	76	PRL 37 569	I. Peruzzi *et al.*	(Mark I Collab.)

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