$D^{\pm}$ – THIS IS PART 1 OF 3

To reduce the size of this section's PostScript file, we have divided it into three PostScript files. We present the following index:

PART 1

PART 2

PART 3

NODE=S031

$D^{\pm}$

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

$D^{\pm}$ MASS

NODE=S031205

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

NODE=S031205

NODE=S031M

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

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

NODE=S031M;LINKAGE=P

$D^{\pm}$ MEAN LIFE

NODE=S031210

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

NODE=S031210

NODE=S031T

VALUE (10^{-12} s)	*EVTS*	*DOCUMENT ID*	*TECN*	*COMMENT*
1.057±0.015 OUR AVERAGE				
1.048±0.015±0.011	9k	FRABETTI 94D	E687	$D^+ \rightarrow K^-\pi^+\pi^+$
1.075±0.040±0.018	2455	FRABETTI 91	E687	γ Be, $D^+ \rightarrow K^-\pi^+\pi^+$
1.03 ±0.08 ±0.06	200	ALVAREZ 90	NA14	γ, $D^+ \rightarrow K^-\pi^+\pi^+$
1.05 $^{+0.077}_{-0.072}$	317	[2] BARLAG 90C	ACCM	π^- Cu 230 GeV
1.05 ±0.08 ±0.07	363	ALBRECHT 88I	ARG	e^+e^- 10 GeV
1.090±0.030±0.025	2992	RAAB 88	E691	Photoproduction
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.12 $^{+0.14}_{-0.11}$	149	AGUILAR-... 87D	HYBR	$\pi^- p$ and pp
1.09 $^{+0.19}_{-0.15}$	59	BARLAG 87B	ACCM	K^- and π^- 200 GeV
1.14 ±0.16 ±0.07	247	CSORNA 87	CLEO	e^+e^- 10 GeV
1.09 ±0.14	74	[3] PALKA 87B	SILI	π Be 200 GeV
0.86 ±0.13 $^{+0.07}_{-0.03}$	48	ABE 86	HYBR	γp 20 GeV

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

NODE=S031T;LINKAGE=BL

[3] PALKA 87B observes this in $D^+ \rightarrow \overline{K}^*(892)e\nu$.

NODE=S031T;LINKAGE=K

D^+ DECAY MODES

NODE=S031215;NODE=S031

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

NODE=S031

	Mode		Fraction (Γ_i/Γ)	Scale factor/ Confidence level	
	Inclusive modes				NODE=S031;CLUMP=A
Γ_1	e^+ anything		(17.2 ± 1.9) %		DESIG=7
Γ_2	K^- anything		(24.2 ± 2.8) %	S=1.4	DESIG=8
Γ_3	$\overline{K}^0$ anything + K^0 anything		(59 ± 7) %		DESIG=9
Γ_4	K^+ anything		(5.8 ± 1.4) %		DESIG=10
Γ_5	η anything	[a]	< 13 %	CL=90%	DESIG=21;OUR EST
Γ_6	μ^+ anything				DESIG=22
Γ_7	$\mu^+\mu^-$ anything				DESIG=23
	Leptonic and semileptonic modes				NODE=S031;CLUMP=B
Γ_8	$\mu^+\nu_\mu$		$< 7.2 \times 10^{-4}$	CL=90%	DESIG=20
Γ_9	$\overline{K}^0 \ell^+ \nu_\ell$	[b]	(6.7 ± 0.8) %		DESIG=182
Γ_{10}	$\overline{K}^0 e^+ \nu_e$		(6.6 ± 0.9) %		DESIG=71
Γ_{11}	$\overline{K}^0 \mu^+ \nu_\mu$		$(7.0 {}^{+3.0}_{-2.0})$ %		DESIG=49
Γ_{12}	$K^- \pi^+ e^+ \nu_e$		$(4.2 {}^{+0.9}_{-0.7})$ %		DESIG=34
Γ_{13}	$\overline{K}^*(892)^0 e^+ \nu_e \times B(\overline{K}^{*0} \to K^- \pi^+)$		(3.2 ± 0.33) %		DESIG=81;OUR EVAL
Γ_{14}	$K^- \pi^+ e^+ \nu_e$ nonresonant		$< 7 \times 10^{-3}$	CL=90%	DESIG=45
Γ_{15}	$K^- \pi^+ \mu^+ \nu_\mu$		(3.2 ± 0.4) %	S=1.1	DESIG=184
	In the fit as $\frac{2}{3}\Gamma_{27} + \Gamma_{17}$, where $\frac{2}{3}\Gamma_{27} = \Gamma_{16}$.				
Γ_{16}	$\overline{K}^*(892)^0 \mu^+ \nu_\mu \times B(\overline{K}^{*0} \to K^- \pi^+)$		(3.0 ± 0.4) %		DESIG=185;OUR EVAL
Γ_{17}	$K^- \pi^+ \mu^+ \nu_\mu$ nonresonant		$(2.7 \pm 1.1) \times 10^{-3}$		DESIG=186
Γ_{18}	$\overline{K}^0 \pi^+ \pi^- e^+ \nu_e$				DESIG=37
Γ_{19}	$K^- \pi^+ \pi^0 e^+ \nu_e$				DESIG=35
Γ_{20}	$(\overline{K}^*(892)\pi)^0 e^+ \nu_e$		< 1.2 %	CL=90%	DESIG=138
Γ_{21}	$(\overline{K}\pi\pi)^0 e^+ \nu_e$ non-$\overline{K}^*(892)$		$< 9 \times 10^{-3}$	CL=90%	DESIG=139
Γ_{22}	$K^- \pi^+ \pi^0 \mu^+ \nu_\mu$		$< 1.4 \times 10^{-3}$	CL=90%	DESIG=187
Γ_{23}	$\pi^0 \ell^+ \nu_\ell$	[c]	$(5.7 \pm 2.2) \times 10^{-3}$		DESIG=183
Γ_{24}	$\pi^+ \pi^- e^+ \nu_e$				DESIG=36
	Fractions of some of the following modes with resonances have already appeared above as submodes of particular charged-particle modes.				CLUMP=C;NODE=S031
Γ_{25}	$\overline{K}^*(892)^0 \ell^+ \nu_\ell$	[b]	(4.8 ± 0.4) %		DESIG=193
Γ_{26}	$\overline{K}^*(892)^0 e^+ \nu_e$		(4.8 ± 0.5) %		DESIG=44
Γ_{27}	$\overline{K}^*(892)^0 \mu^+ \nu_\mu$		(4.5 ± 0.6) %	S=1.1	DESIG=179
Γ_{28}	$\rho^0 e^+ \nu_e$		$< 3.7 \times 10^{-3}$	CL=90%	DESIG=154
Γ_{29}	$\rho^0 \mu^+ \nu_\mu$		$(2.0 {}^{+1.5}_{-1.3}) \times 10^{-3}$		DESIG=188
Γ_{30}	$\phi e^+ \nu_e$		< 2.09 %	CL=90%	DESIG=124
Γ_{31}	$\phi \mu^+ \nu_\mu$		< 3.72 %	CL=90%	DESIG=125
Γ_{32}	$\eta'(958) \mu^+ \nu_\mu$		$< 9 \times 10^{-3}$	CL=90%	DESIG=180

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

NODE=S031;CLUMP=D

Γ_{33}	$\overline{K}^0\pi^+$		(2.74 ± 0.29) %		DESIG=2
Γ_{34}	$K^-\pi^+\pi^+$	[d]	(9.1 ± 0.6) %		DESIG=1
Γ_{35}	$\overline{K}^*(892)^0\pi^+$ $\times$ B($\overline{K}^{*0}\to K^-\pi^+$)		(1.28 ± 0.13) %		DESIG=83;OUR EVAL
Γ_{36}	$\overline{K}_0^*(1430)^0\pi^+$ $\times$ B($\overline{K}_0^*(1430)^0\to K^-\pi^+$)		(2.3 ± 0.3) %		DESIG=191;OUR EVAL
Γ_{37}	$\overline{K}^*(1680)^0\pi^+$ $\times$ B($\overline{K}^*(1680)^0\to K^-\pi^+$)		$(3.7\pm0.8)\times10^{-3}$		DESIG=192;OUR EVAL
Γ_{38}	$K^-\pi^+\pi^+$ nonresonant		(8.6 ± 0.9) %		DESIG=28
Γ_{39}	$\overline{K}^0\pi^+\pi^0$	[d]	(9.7 ± 3.0) %	S=1.1	DESIG=12
Γ_{40}	$\overline{K}^0\rho^+$		(6.6 ± 2.5) %		DESIG=18
Γ_{41}	$\overline{K}^*(892)^0\pi^+$ $\times$ B($\overline{K}^{*0}\to\overline{K}^0\pi^0$)		$(6.4\pm0.6)\times10^{-3}$		DESIG=82;OUR EVAL
Γ_{42}	$\overline{K}^0\pi^+\pi^0$ nonresonant		(1.3 ± 1.1) %		DESIG=27
Γ_{43}	$K^-\pi^+\pi^+\pi^0$	[d]	(6.4 ± 1.1) %		DESIG=17
Γ_{44}	$\overline{K}^*(892)^0\rho^+$ total $\times$ B($\overline{K}^{*0}\to K^-\pi^+$)		(1.4 ± 0.9) %		DESIG=157;OUR EVAL
Γ_{45}	$\overline{K}_1(1400)^0\pi^+$ $\times$ B($\overline{K}_1(1400)^0\to K^-\pi^+\pi^0$)		(2.2 ± 0.6) %		DESIG=158;OUR EVAL
Γ_{46}	$K^-\rho^+\pi^+$ total		(3.1 ± 1.1) %		DESIG=172;OUR EVAL
Γ_{47}	$K^-\rho^+\pi^+$ 3-body		(1.1 ± 0.4) %		DESIG=159;OUR EVAL
Γ_{48}	$\overline{K}^*(892)^0\pi^+\pi^0$ total $\times$ B($\overline{K}^{*0}\to K^-\pi^+$)		(4.5 ± 0.9) %		DESIG=175;OUR EVAL
Γ_{49}	$\overline{K}^*(892)^0\pi^+\pi^0$ 3-body $\times$ B($\overline{K}^{*0}\to K^-\pi^+$)		(2.8 ± 0.9) %		DESIG=194;OUR EVAL
Γ_{50}	$K^*(892)^-\pi^+\pi^+$ 3-body $\times$ B($K^{*-}\to K^-\pi^0$)		$(7\pm3)\times10^{-3}$		DESIG=177;OUR EVAL
Γ_{51}	$K^-\pi^+\pi^+\pi^0$ nonresonant	[e]	(1.2 ± 0.6) %		DESIG=153
Γ_{52}	$\overline{K}^0\pi^+\pi^+\pi^-$	[d]	(7.0 ± 1.0) %		DESIG=13
Γ_{53}	$\overline{K}^0a_1(1260)^+$ $\times$ B($a_1(1260)^+\to\pi^+\pi^+\pi^-$)		(4.0 ± 0.9) %		DESIG=160;OUR EVAL
Γ_{54}	$\overline{K}_1(1400)^0\pi^+$ $\times$ B($\overline{K}_1(1400)^0\to\overline{K}^0\pi^+\pi^-$)		(2.2 ± 0.6) %		DESIG=161;OUR EVAL
Γ_{55}	$K^*(892)^-\pi^+\pi^+$ 3-body $\times$ B($K^{*-}\to\overline{K}^0\pi^-$)		(1.4 ± 0.6) %		DESIG=163;OUR EVAL
Γ_{56}	$\overline{K}^0\rho^0\pi^+$ total		(4.2 ± 0.9) %		DESIG=178;OUR EVAL
Γ_{57}	$\overline{K}^0\rho^0\pi^+$ 3-body		$(5\pm5)\times10^{-3}$		DESIG=201;OUR EVAL
Γ_{58}	$\overline{K}^0\pi^+\pi^+\pi^-$ nonresonant		$(8\pm4)\times10^{-3}$		DESIG=152
Γ_{59}	$K^-\pi^+\pi^+\pi^+\pi^-$		$(8.2\pm1.4)\times10^{-3}$		DESIG=14
Γ_{60}	$\overline{K}^*(892)^0\pi^+\pi^+\pi^-$ $\times$ B($\overline{K}^{*0}\to K^-\pi^+$)		$(6.8\pm1.8)\times10^{-3}$		DESIG=57;OUR EVAL
Γ_{61}	$\overline{K}^*(892)^0\rho^0\pi^+$ $\times$ B($\overline{K}^{*0}\to K^-\pi^+$)		$(5.1\pm2.2)\times10^{-3}$		DESIG=58;OUR EVAL
Γ_{62}	$K^-\pi^+\pi^+\pi^0\pi^0$		$(2.2\,^{+5.0}_{-0.9})$ %		DESIG=30
Γ_{63}	$\overline{K}^0\pi^+\pi^+\pi^-\pi^0$		$(5.4\,^{+3.0}_{-1.4})$ %		DESIG=29
Γ_{64}	$\overline{K}^0\pi^+\pi^+\pi^+\pi^-\pi^-$		$(8\pm7)\times10^{-4}$		DESIG=128
Γ_{65}	$K^-\pi^+\pi^+\pi^+\pi^-\pi^0$		$(2.0\pm1.8)\times10^{-3}$		DESIG=129
Γ_{66}	$\overline{K}^0\overline{K}^0K^+$		(1.8 ± 0.8) %		DESIG=59

Fractions of some of the following modes with resonances have already appeared above as submodes of particular charged-particle modes. CLUMP=E;NODE=S031

Γ_{67}	$\overline{K}^0 \rho^+$		(6.6 ±2.5) %		DESIG=155;OUR EVAL
Γ_{68}	$\overline{K}^0 a_1(1260)^+$		(8.1 ±1.7) %		DESIG=143
Γ_{69}	$\overline{K}^0 a_2(1320)^+$		< 3 $\times 10^{-3}$	CL=90%	DESIG=144
Γ_{70}	$\overline{K}^*(892)^0 \pi^+$		(1.92±0.19) %		DESIG=11
Γ_{71}	$\overline{K}^*(892)^0 \rho^+$ total		(2.1 ±1.4) %		DESIG=165
Γ_{72}	$\overline{K}^*(892)^0 \rho^+$ *S*-wave	[e]	(1.7 ±1.6) %		DESIG=140
Γ_{73}	$\overline{K}^*(892)^0 \rho^+$ *P*-wave		< 1 $\times 10^{-3}$	CL=90%	DESIG=141
Γ_{74}	$\overline{K}^*(892)^0 \rho^+$ *D*-wave		(10 ±7) $\times 10^{-3}$		DESIG=166
Γ_{75}	$\overline{K}^*(892)^0 \rho^+$ *D*-wave longitudinal		< 7 $\times 10^{-3}$	CL=90%	DESIG=142
Γ_{76}	$\overline{K}_1(1270)^0 \pi^+$		< 7 $\times 10^{-3}$	CL=90%	DESIG=145
Γ_{77}	$\overline{K}_1(1400)^0 \pi^+$		(5.0 ±1.3) %		DESIG=146
Γ_{78}	$\overline{K}^*(1410)^0 \pi^+$		< 7 $\times 10^{-3}$	CL=90%	DESIG=147
Γ_{79}	$\overline{K}_0^*(1430)^0 \pi^+$		(3.7 ±0.4) %		DESIG=189
Γ_{80}	$\overline{K}^*(1680)^0 \pi^+$		(1.45±0.31) %		DESIG=190
Γ_{81}	$\overline{K}^*(892)^0 \pi^+ \pi^0$ total		(6.7 ±1.4) %		DESIG=167
Γ_{82}	$\overline{K}^*(892)^0 \pi^+ \pi^0$ 3-body		(4.2 ±1.4) %		DESIG=149
Γ_{83}	$K^*(892)^- \pi^+ \pi^+$ total				DESIG=196
Γ_{84}	$K^*(892)^- \pi^+ \pi^+$ 3-body		(2.1 ±0.9) %		DESIG=148
Γ_{85}	$K^- \rho^+ \pi^+$ total		(3.1 ±1.1) %		DESIG=168
Γ_{86}	$K^- \rho^+ \pi^+$ 3-body		(1.1 ±0.4) %		DESIG=150
Γ_{87}	$\overline{K}^0 \rho^0 \pi^+$ total		(4.2 ±0.9) %	CL=90%	DESIG=170
Γ_{88}	$\overline{K}^0 \rho^0 \pi^+$ 3-body		(5 ±5) $\times 10^{-3}$		DESIG=151
Γ_{89}	$\overline{K}^0 f_0(980) \pi^+$		< 5 $\times 10^{-3}$	CL=90%	DESIG=169
Γ_{90}	$\overline{K}^*(892)^0 \pi^+ \pi^+ \pi^-$		(1.02±0.27) %		DESIG=55
Γ_{91}	$\overline{K}^*(892)^0 \rho^0 \pi^+$		(7.7 ±3.3) $\times 10^{-3}$		DESIG=56

Pionic modes NODE=S031;CLUMP=F

Γ_{92}	$\pi^+ \pi^0$	(2.5 ±0.7) $\times 10^{-3}$		DESIG=15
Γ_{93}	$\pi^+ \pi^+ \pi^-$	(3.2 ±0.6) $\times 10^{-3}$		DESIG=3
Γ_{94}	$\rho^0 \pi^+$	< 1.4 $\times 10^{-3}$	CL=90%	DESIG=47
Γ_{95}	$\pi^+ \pi^+ \pi^-$ nonresonant	(2.5 ±0.7) $\times 10^{-3}$		DESIG=46
Γ_{96}	$\pi^+ \pi^+ \pi^- \pi^0$	(1.9 $^{+1.5}_{-1.2}$) %		DESIG=50
Γ_{97}	$\eta \pi^+ \times$ B($\eta \to \pi^+ \pi^- \pi^0$)	(1.8 ±0.6) $\times 10^{-3}$		DESIG=84;OUR EVAL
Γ_{98}	$\omega \pi^+ \times$ B($\omega \to \pi^+ \pi^- \pi^0$)	< 6 $\times 10^{-3}$	CL=90%	DESIG=85;OUR EVAL
Γ_{99}	$\pi^+ \pi^+ \pi^+ \pi^- \pi^-$	(1.0 $^{+0.8}_{-0.7}$) $\times 10^{-3}$		DESIG=48
Γ_{100}	$\pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^0$	(2.9 $^{+2.9}_{-2.0}$) $\times 10^{-3}$		DESIG=31

Fractions of some of the following modes with resonances have already appeared above as submodes of particular charged-particle modes. CLUMP=G;NODE=S031

Γ_{101}	$\eta \pi^+$	(7.5 ±2.5) $\times 10^{-3}$		DESIG=51
Γ_{102}	$\rho^0 \pi^+$	< 1.4 $\times 10^{-3}$	CL=90%	DESIG=156;OUR EVAL
Γ_{103}	$\omega \pi^+$	< 7 $\times 10^{-3}$	CL=90%	DESIG=52
Γ_{104}	$\eta \rho^+$	< 1.2 %	CL=90%	DESIG=91
Γ_{105}	$\eta'(958) \pi^+$	< 9 $\times 10^{-3}$	CL=90%	DESIG=90
Γ_{106}	$\eta'(958) \rho^+$	< 1.5 %	CL=90%	DESIG=92

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

NODE=S031;CLUMP=H

	Mode		Fraction	CL	
Γ_{107}	$K^+\overline{K}^0$		$(7.2 \pm 1.2) \times 10^{-3}$		DESIG=16
Γ_{108}	$K^+K^-\pi^+$	[d]	$(8.9 \pm 0.8) \times 10^{-3}$		DESIG=4
Γ_{109}	$\phi\pi^+ \times B(\phi \to K^+K^-)$		$(3.0 \pm 0.3) \times 10^{-3}$		DESIG=89;OUR EVAL
Γ_{110}	$K^+\overline{K}^*(892)^0 \times B(\overline{K}^{*0} \to K^-\pi^+)$		$(2.8 \pm 0.4) \times 10^{-3}$		DESIG=86;OUR EVAL
Γ_{111}	$K^+K^-\pi^+$ nonresonant		$(4.6 \pm 0.9) \times 10^{-3}$		DESIG=26
Γ_{112}	$K^0\overline{K}^0\pi^+$				DESIG=202;OUR EVAL
Γ_{113}	$K^*(892)^+\overline{K}^0 \times B(K^{*+} \to K^0\pi^+)$		(2.0 ± 0.9) %		DESIG=203;OUR EVAL
Γ_{114}	$K^+K^-\pi^+\pi^0$				DESIG=87;OUR EVAL
Γ_{115}	$\phi\pi^+\pi^0 \times B(\phi \to K^+K^-)$		(1.1 ± 0.5) %		DESIG=173;OUR EVAL
Γ_{116}	$\phi\rho^+ \times B(\phi \to K^+K^-)$		$< 7 \times 10^{-3}$	CL=90%	DESIG=127;OUR EVAL
Γ_{117}	$K^+K^-\pi^+\pi^0$ non-ϕ		$(1.5 ^{+0.7}_{-0.6})$ %		DESIG=54
Γ_{118}	$K^+\overline{K}^0\pi^+\pi^-$		< 2 %	CL=90%	DESIG=134
Γ_{119}	$K^0K^-\pi^+\pi^+$		(1.0 ± 0.6) %		DESIG=130
Γ_{120}	$K^*(892)^+\overline{K}^*(892)^0 \times B^2(K^* \to K\pi^+)$		(1.2 ± 0.5) %		DESIG=137;OUR EVAL
Γ_{121}	$K^0K^-\pi^+\pi^+$ non-$K^{*+}\overline{K}^{*0}$		$< 7.9 \times 10^{-3}$	CL=90%	DESIG=136
Γ_{122}	$K^+K^-\pi^+\pi^+\pi^-$				DESIG=88;OUR EVAL
Γ_{123}	$\phi\pi^+\pi^+\pi^- \times B(\phi \to K^+K^-)$		$< 1 \times 10^{-3}$	CL=90%	DESIG=174;OUR EVAL
Γ_{124}	$K^+K^-\pi^+\pi^+\pi^-$ nonresonant		< 3 %	CL=90%	DESIG=39

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

CLUMP=I;NODE=S031

	Mode		Fraction	CL	
Γ_{125}	$\phi\pi^+$		$(6.1 \pm 0.6) \times 10^{-3}$		DESIG=24
Γ_{126}	$\phi\pi^+\pi^0$		(2.3 ± 1.0) %		DESIG=53
Γ_{127}	$\phi\rho^+$		< 1.5 %	CL=90%	DESIG=93
Γ_{128}	$\phi\pi^+\pi^+\pi^-$		$< 2 \times 10^{-3}$	CL=90%	DESIG=38
Γ_{129}	$K^+\overline{K}^*(892)^0$		$(4.2 \pm 0.5) \times 10^{-3}$		DESIG=25
Γ_{130}	$K^*(892)^+\overline{K}^0$		(3.0 ± 1.4) %		DESIG=197
Γ_{131}	$K^*(892)^+\overline{K}^*(892)^0$		(2.6 ± 1.1) %		DESIG=135

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

NODE=S031;CLUMP=J

	Mode			Fraction	CL	
Γ_{132}	$K^+\pi^+\pi^-$	*DC*		$(6.5 \pm 2.6) \times 10^{-4}$		DESIG=5
Γ_{133}	$K^+\rho^0$	*DC*		$< 6 \times 10^{-4}$	CL=90%	DESIG=204
Γ_{134}	$K^*(892)^0\pi^+$	*DC*		$< 1.9 \times 10^{-4}$	CL=90%	DESIG=205
Γ_{135}	$K^+K^+K^-$	*DC*		$< 1.5 \times 10^{-4}$	CL=90%	DESIG=181
Γ_{136}	ϕK^+	*DC*		$< 1.3 \times 10^{-4}$	CL=90%	DESIG=162
Γ_{137}	$\pi^+e^+e^-$	*C1*		$< 6.6 \times 10^{-5}$	CL=90%	DESIG=41
Γ_{138}	$\pi^+\mu^+\mu^-$	*C1*		$< 1.8 \times 10^{-5}$	CL=90%	DESIG=42
Γ_{139}	$\rho^+\mu^+\mu^-$	*C1*		$< 5.6 \times 10^{-4}$	CL=90%	DESIG=198
Γ_{140}	$K^+e^+e^-$		[f]	$< 4.8 \times 10^{-3}$	CL=90%	DESIG=113
Γ_{141}	$K^+\mu^+\mu^-$		[f]	$< 3.2 \times 10^{-4}$	CL=90%	DESIG=114
Γ_{142}	$\pi^+e^\pm\mu^\mp$	*LF*	[g]	$< 3.8 \times 10^{-3}$	CL=90%	DESIG=43
Γ_{143}	$\pi^+e^+\mu^-$	*LF*		$< 3.3 \times 10^{-3}$	CL=90%	DESIG=110
Γ_{144}	$\pi^+e^-\mu^+$	*LF*		$< 3.3 \times 10^{-3}$	CL=90%	DESIG=111
Γ_{145}	$K^+e^+\mu^-$	*LF*		$< 3.4 \times 10^{-3}$	CL=90%	DESIG=115
Γ_{146}	$K^+e^-\mu^+$	*LF*		$< 3.4 \times 10^{-3}$	CL=90%	DESIG=116
Γ_{147}	$\pi^-e^+e^+$	*L*		$< 4.8 \times 10^{-3}$	CL=90%	DESIG=117
Γ_{148}	$\pi^-\mu^+\mu^+$	*L*		$< 2.2 \times 10^{-4}$	CL=90%	DESIG=118
Γ_{149}	$\pi^-e^+\mu^+$	*L*		$< 3.7 \times 10^{-3}$	CL=90%	DESIG=119
Γ_{150}	$\rho^-\mu^+\mu^+$	*L*		$< 5.6 \times 10^{-4}$	CL=90%	DESIG=199
Γ_{151}	$K^-e^+e^+$	*L*		$< 9.1 \times 10^{-3}$	CL=90%	DESIG=120
Γ_{152}	$K^-\mu^+\mu^+$	*L*		$< 3.2 \times 10^{-4}$	CL=90%	DESIG=121
Γ_{153}	$K^-e^+\mu^+$	*L*		$< 4.0 \times 10^{-3}$	CL=90%	DESIG=122
Γ_{154}	$K^*(892)^-\mu^+\mu^+$	*L*		$< 8.5 \times 10^{-4}$	CL=90%	DESIG=200

NODE=S031;CLUMP=Z

Γ_{155} A dummy mode used by the fit. (36 ±5) % DESIG=19

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

[*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^+ is really an e^+. LINKAGE=EP

[*c*] ℓ indicates e or μ mode, not sum over modes. LINKAGE=DX

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

[*e*] The two experiments determining this ratio are in serious disagreement. See the Particle Listings. LINKAGE=NF

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

[*g*] The value is for the sum of the charge states of particle/antiparticle states indicated. LINKAGE=SG

CONSTRAINED FIT INFORMATION

An overall fit to 23 branching ratios uses 37 measurements and one constraint to determine 14 parameters. The overall fit has a χ^2 = 13.8 for 24 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_{10}	x_{12}	x_{17}	x_{26}	x_{27}	x_{33}	x_{34}	x_{39}	x_{43}	x_{52}
x_{12}	4									
x_{17}	4	2								
x_{26}	15	29	8							
x_{27}	12	7	31	26						
x_{33}	41	6	5	20	16					
x_{34}	27	17	14	57	45	35				
x_{39}	0	0	0	0	0	0	0			
x_{43}	6	4	3	13	10	8	23	0		
x_{52}	8	5	4	17	14	10	30	0	18	
x_{70}	18	11	9	37	30	23	65	0	15	20
x_{77}	4	3	2	9	7	5	15	0	31	37
x_{84}	2	1	1	5	4	3	9	0	29	13
x_{155}	−33	−27	−12	−40	−33	−29	−52	−60	−46	−45

	x_{70}	x_{77}	x_{84}
x_{77}	10		
x_{84}	6	12	
x_{155}	−36	−47	−33

D^+ BRANCHING RATIOS

NODE=S031220

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

NODE=S031220

Inclusive modes

NODE=S031310

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

NODE=S031R5

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

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

NODE=S031R10

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.

NODE=S031R10

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

[4] Isolates D^+ and $D^0 \rightarrow e^+ X$ and weights for relative production (44%–56%). NODE=S031R10;LINKAGE=B

[5] ABE 93E also measures forward-backward asymmetries and fragmentation functions for c and b quarks. NODE=S031R10;LINKAGE=D

[6] ALBRECHT 92F uses the excess of right-sign over wrong-sign leptons in a sample of events tagged by fully reconstructed $D^*(2010)^+ \rightarrow D^0\pi^+$ decays. NODE=S031R10;LINKAGE=E

[7] Average BR for charm $\rightarrow e^+ X$. Unlike at E_{cm} = 3.77 GeV, the admixture of charmed mesons is unknown. NODE=S031R10;LINKAGE=C

[8] Not independent of BACINO 80 measurements of $\Gamma(e^+ \text{anything})/\Gamma_{total}$ for the D^+ and D^0 separately. NODE=S031R10;LINKAGE=A

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

NODE=S031R1

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.242±0.028 OUR AVERAGE	Error includes scale factor of 1.4. See the ideogram below.				
$0.278^{+0.036}_{-0.031}$		[9] BARLAG	92C	ACCM	π^- Cu 230 GeV
0.271±0.023±0.024		COFFMAN	91	MRK3	e^+e^- 3.77 GeV
0.17 ±0.07		AGUILAR-...	87E	HYBR	πp, pp 360, 400 GeV
0.19 ±0.05	26	SCHINDLER	81	MRK2	e^+e^- 3.771 GeV
0.10 ±0.07	3	VUILLEMIN	78	MRK1	e^+e^- 3.772 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.16\ ^{+0.08}_{-0.07}$		AGUILAR-...	86B	HYBR	See AGUILAR-BENITEZ 87E

[9] BARLAG 92C computes the branching fraction using topological normalization. NODE=S031R1;LINKAGE=A

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

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

NODE=S031R3

NODE=S031R3

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

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

NODE=S031R2

NODE=S031R2

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

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

NODE=S031R4

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.

NODE=S031R4

NODE=S031R4

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	[10] BRANDELIK	79	DASP	$e^+ e^-$ 4.03 GeV

[10] 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.

NODE=S031R4;LINKAGE=B

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

NODE=S031R6

This is the average branching ratio for charm $\rightarrow$ μ^+X. The mixture of charmed particles is unknown and may actually contain states other than D mesons.

NODE=S031R6

NODE=S031R6

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$0.081^{+0.010}_{-0.009}$ OUR AVERAGE					
$0.086\pm0.017^{+0.008}_{-0.007}$	69	[11] ALBRECHT	92F	ARG	$e^+ e^-$ $\approx$ 10 GeV
0.078±0.009±0.012		ONG	88	MRK2	$e^+ e^-$ 29 GeV
0.078±0.015±0.02		BARTEL	87	JADE	$e^+ e^-$ 34.6 GeV
$0.082\pm0.012^{+0.02}_{-0.01}$		ALTHOFF	84G	TASS	$e^+ e^-$ 34.5 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.089±0.018±0.025		BARTEL	85J	JADE	See BARTEL 87

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

NODE=S031R6;LINKAGE=E

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

NODE=S031R56
NODE=S031R56

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<2.2 \times 10^{-3}$	90	0.1	[12] HAAS	88	CLEO	$e^+ e^-$ 10 GeV

[12] The normalization uses a continuum charm production estimate.

NODE=S031R56;LINKAGE=A

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

NODE=S031R57
NODE=S031R57

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$<3.7 \times 10^{-3}$	90	0.2	[13] HAAS	88	CLEO	$e^+ e^-$ 10 GeV

[13] The normalization uses a continuum charm production estimate.

NODE=S031R57;LINKAGE=A

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

NODE=S031R9
NODE=S031R9

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.018	90	0.3	[14] HAAS	88	CLEO	$e^+ e^-$ 10 GeV
<0.007	95		[15] ALTHOFF	84G	TASS	$e^+ e^-$ 34.5 GeV

[14] The normalization uses a continuum charm production estimate.

NODE=S031R9;LINKAGE=A

[15] Average BR for charm $\rightarrow \mu^+ \mu^-$ X. The mixture of charmed particles is unknown and may actually contain states other than D mesons.

NODE=S031R9;LINKAGE=C

Leptonic and semileptonic modes

NODE=S031315

$\Gamma(\mu^+ \nu_\mu)/\Gamma_{\text{total}}$ — Γ_8/Γ

NODE=S031R8
NODE=S031R8

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

NODE=S031R8

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<0.00072	90		ADLER	88B	MRK3	$e^+ e^-$ 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.02	90	0	[16] AUBERT	83	SPEC	μ^+ Fe, 250 GeV

[16] 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.

NODE=S031R8;LINKAGE=A

$\Gamma(\overline{K}^0 \ell^+ \nu_\ell)/\Gamma_{\text{total}}$ — Γ_9/Γ

NODE=S031B60
NODE=S031B60

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^+.

NODE=S031B60

VALUE	DOCUMENT ID		COMMENT
0.067±0.008 OUR AVERAGE			
0.066±0.009	PDG	96	Our $\Gamma(\overline{K}^0 e^+ \nu_e)/\Gamma_{\text{total}}$
$0.072^{+0.031}_{-0.021}$	PDG	96	1.03 × our $\Gamma(\overline{K}^0 \mu^+ \nu_\mu)/\Gamma_{\text{total}}$

OCCUR=2

$\Gamma(\overline{K}^0 e^+ \nu_e)/\Gamma_{\text{total}}$ — Γ_{10}/Γ

NODE=S031R93
NODE=S031R93

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.066±0.009 OUR FIT					
$0.06\ ^{+0.022}_{-0.013} \pm 0.007$	13	BAI	91	MRK3	$e^+ e^- \approx$ 3.77 GeV

$\Gamma(\overline{K}^0 e^+ \nu_e)/\Gamma(\overline{K}^0 \pi^+)$ — Γ_{10}/Γ_{33}

NODE=S031B55
NODE=S031B55

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
2.39±0.33 OUR FIT					
2.60±0.35±0.26	186	[17] BEAN	93C	CLEO	$e^+ e^- \approx \Upsilon(4S)$

[17] 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.

NODE=S031B55;LINKAGE=A

$\Gamma(\overline{K}^0 e^+ \nu_e)/\Gamma(K^- \pi^+ \pi^+)$ — Γ_{10}/Γ_{34}

NODE=S031R86
NODE=S031R86

VALUE	DOCUMENT ID		TECN	COMMENT
0.72±0.10 OUR FIT				
0.66±0.09±0.14	ANJOS	91C	E691	γ Be 80–240 GeV

$\Gamma(\overline{K}^0 \mu^+ \nu_\mu)/\Gamma_{\text{total}}$ — Γ_{11}/Γ

NODE=S031R94
NODE=S031R94

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

$\Gamma(\overline{K}^0 \mu^+ \nu_\mu)/\Gamma(\mu^+ \text{anything})$ Γ_{11}/Γ_6

NODE=S031R68
NODE=S031R68

VALUE	EVTS	DOCUMENT ID		COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.76±0.06	84	[18] AOKI	88	π^- emulsion

[18] From topological branching ratios in emulsion with an identified muon. NODE=S031R68;LINKAGE=A

$\Gamma(K^- \pi^+ e^+ \nu_e)/\Gamma_{total}$ Γ_{12}/Γ

NODE=S031R45
NODE=S031R45

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$0.042^{+0.009}_{-0.007}$ OUR FIT						
$0.035^{+0.012}_{-0.007}\pm0.004$		14	[19] BAI	91	MRK3	$e^+ e^- \approx$ 3.77 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.057	90		[20] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV

[19] 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 $\overline{K}^*(892) e^+ \nu_e$. NODE=S031R45;LINKAGE=A

[20] AGUILAR-BENITEZ 87F computes the branching fraction using topological normalization. NODE=S031R45;LINKAGE=K

$\Gamma(\overline{K}^*(892)^0 \ell^+ \nu_\ell)/\Gamma_{total}$ Γ_{25}/Γ

NODE=S031B61

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^+. NODE=S031B61

NODE=S031B61

VALUE	DOCUMENT ID		COMMENT
0.048±0.004 OUR AVERAGE			
0.048±0.005	PDG	96	Our $\Gamma(\overline{K}^{*0} e^+ \nu_e)/\Gamma_{total}$
0.047±0.006	PDG	96	1.05 × our $\Gamma(\overline{K}^{*0} \mu^+ \nu_\mu)/\Gamma_{total}$

OCCUR=2

$\Gamma(\overline{K}^*(892)^0 e^+ \nu_e)/\Gamma(K^- \pi^+ e^+ \nu_e)$ Γ_{26}/Γ_{12}

NODE=S031R87

Unseen decay modes of the $\overline{K}^*(892)^0$ are included. NODE=S031R87

NODE=S031R87

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

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

NODE=S031R58

Unseen decay modes of the $\overline{K}^*(892)^0$ are included. NODE=S031R58

NODE=S031R58

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.53±0.05 OUR FIT					
0.54±0.05 OUR AVERAGE					
0.67±0.09±0.07	710	[21] BEAN	93C	CLEO	$e^+ e^- \approx \Upsilon(4S)$
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

[21] 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. NODE=S031R58;LINKAGE=AA

$\Gamma(K^- \pi^+ e^+ \nu_e \text{ nonresonant})/\Gamma_{total}$ Γ_{14}/Γ

NODE=S031R59
NODE=S031R59

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.007	90	[22] ANJOS	89B	E691	Photoproduction

[22] ANJOS 89B assumes a $\Gamma(D^+ \to K^- \pi^+ \pi^+)/\Gamma_{total}$ = 9.1 ± 1.3 ± 0.4%. NODE=S031R59;LINKAGE=A

$\Gamma(K^- \pi^+ \mu^+ \nu_\mu)/\Gamma_{total}$ $\Gamma_{15}/\Gamma = (\Gamma_{17}+\frac{2}{3}\Gamma_{27})/\Gamma$

NODE=S031B71
NODE=S031B71

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

$\Gamma(\overline{K}^*(892)^0 \mu^+ \nu_\mu)/\Gamma_{total}$ Γ_{27}/Γ

NODE=S031B59

Unseen decay modes of the $\overline{K}^*(892)^0$ are included. NODE=S031B59

NODE=S031B59

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.045 ±0.006 OUR FIT Error includes scale factor of 1.1.					
0.0325±0.0071±0.0075	224	[23] KODAMA	92C	E653	π^- emulsion 600 GeV

[23] KODAMA 92C measures $\Gamma(D^+ \to \overline{K}^{*0} \mu^+ \nu_\mu)/\Gamma(D^0 \to K^- \mu^+ \nu_\mu) = 0.43 \pm 0.09 \pm 0.09$ and then uses $\Gamma(D^0 \to K^- \mu^+ \nu_\mu) = (7.0 \pm 0.7) \times 10^{10}\ \mathrm{s}^{-1}$ to get the quoted branching fraction. See also the footnote to KODAMA 92C in the next data block. NODE=S031B59;LINKAGE=AA

$\Gamma(\overline{K}^*(892)^0\mu^+\nu_\mu)/\Gamma(K^-\pi^+\pi^+)$ Γ_{27}/Γ_{34}

NODE=S031B51

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

NODE=S031B51
NODE=S031B51

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.49±0.06 OUR FIT Error includes scale factor of 1.1.					
0.53±0.06 OUR AVERAGE					
0.56±0.04±0.06	875	FRABETTI	93E	E687	γBe $\overline{E}_\gamma\approx$ 200 GeV
0.46±0.07±0.08	224	[24] KODAMA	92C	E653	π^- emulsion 600 GeV

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

NODE=S031B51;LINKAGE=AA

$\Gamma(K^-\pi^+\mu^+\nu_\mu$ nonresonant$)/\Gamma(K^-\pi^+\mu^+\nu_\mu)$ $\Gamma_{17}/\Gamma_{15}=\Gamma_{17}/(\Gamma_{17}+\frac{2}{3}\Gamma_{27})$

NODE=S031B52
NODE=S031B52

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

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

NODE=S031R48
NODE=S031R48

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	[25] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV

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

NODE=S031R48;LINKAGE=K

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

NODE=S031R46
NODE=S031R46

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	[26] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV

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

NODE=S031R46;LINKAGE=K

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

NODE=S031B15

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

NODE=S031B15
NODE=S031B15

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

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

NODE=S031B16
NODE=S031B16

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

$\Gamma(K^-\pi^+\pi^0\mu^+\nu_\mu)/\Gamma(K^-\pi^+\mu^+\nu_\mu)$ $\Gamma_{22}/\Gamma_{15}=\Gamma_{22}/(\Gamma_{17}+\frac{2}{3}\Gamma_{27})$

NODE=S031B53
NODE=S031B53

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

$\Gamma(\pi^0\ell^+\nu_\ell)/\Gamma(\overline{K}^0\ell^+\nu_\ell)$ Γ_{23}/Γ_9

NODE=S031B48
NODE=S031B48

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.085±0.027±0.014	53	[27] ALAM	93	CLEO	$e^+e^-\approx\Upsilon(4S)$

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

NODE=S031B48;LINKAGE=A

$\Gamma(\pi^+\pi^-e^+\nu_e)/\Gamma_{\text{total}}$ Γ_{24}/Γ

NODE=S031R47
NODE=S031R47

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.057	90	[28] AGUILAR-...	87F	HYBR	πp, pp 360, 400 GeV

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

NODE=S031R47;LINKAGE=K

$\Gamma(\rho^0e^+\nu_e)/\Gamma_{\text{total}}$ Γ_{28}/Γ

NODE=S031R95
NODE=S031R95

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0037	90	BAI	91	MRK3	$e^+e^-\approx$ 3.77 GeV

$\Gamma(\rho^0\mu^+\nu_\mu)/\Gamma(\overline{K}^*(892)^0\mu^+\nu_\mu)$ Γ_{29}/Γ_{27}

NODE=S031B50
NODE=S031B50

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$0.044^{+0.031}_{-0.025}\pm0.014$	4	[29] KODAMA	93C	E653	π^- emulsion 600 GeV

[29] 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.

NODE=S031B50;LINKAGE=A